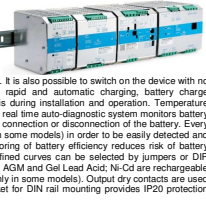


All In One™ CBI series: Uninterruptible Power Supply with DC output

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) and 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. Prefined 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 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: 3-stage (UoI) (Bulk, Absorption, Trickle) 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 on DIN rail
 • Space saving on DIN rail



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 curve for Lead Acid batteries: 3-stage (UoI) (Bulk, Absorption, Trickle) plus Recovery stage for deeply discharged batteries
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- IP20 protection on DIN rail
- 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:

AWG	Stranded (mm²)	AWG	Torque (Nm)	Stripping Length (mm)	All In One (Size 1 and 2)	Phase L, N, PE Input AC	Phase L, N, PE Input AC
0.2 - 2.5	0.2 - 2.5	24 - 14	0.5 - 0.6	7 mm	Size 1 and 2	1	1
4.0	5.0	30 - 10	0.8 - 1.0	7 mm	Size 3 and 4	2	2
0.2 - 2.5	0.2 - 2.5	24 - 14	0.5 - 0.6	7 mm	Size 1 and 2	1	1
4.0	5.0	30 - 10	0.8 - 1.0	7 mm	Size 3 and 4	2	2
Signal	0.2 - 2.5	0.2 - 2.5	0.4 - 0.5	7 mm	All types		

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:

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"
 Power supplies can be paralleled for 1+1 redundancy to obtain a higher system availability. Redundant systems require a certain amount of extra power to support the sum of the current in each power supply unit. 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. This simple way to build a redundant system has two major disadvantages:
 - The faulty power supply can not be recognized.
 - The Diagnosis LED will give the information about the status of the Load and the Battery (see Display Signal for more details), it does not monitor the individual CBI units.
 Monitor the individual CBI units by three LED. Each unit has two systems: Mains or backup and Low Battery or Battery Replacement (faulty system). 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 supplies can be paralleled for 1+1 parallel to obtain a double power of a single unit. The possibility to put in parallel connection is only in SIZE 3 devices in the specific "P" version (e.g. CBI420PAP), to be aware the sum of the current in the same output voltage. It is necessary to use a standard UTP cable RJ45 to connect Au2 of each device. The communication protocol is based on CAN2.0A standard. In this way the system have only one output for the Load and one output for the battery.
 a) Use separate input buses for each CBI.
 b) The connections does not provide any preparation, only the connection to the RJ45 cable also with two the devices already powered, make sure that the two CBI have the same settings (battery type, charging level current, time buffering, life test ...), because at every power on (or after the connection of the cable RJ45) configure themselves one as the Master (which give you all the visual signals) and one as the Slave (Diagnosis LED always ON) without a default choice.
 c) Use the alarm contacts of both the devices.
 For Start Battery without mains voltage, push start button on both units.
 The models with software for parallel ("P" suffix) can be used also simply not connecting with each other with the RJ45 cable.

Series connection:
 a) It is possible to connect as many units in series as needed, providing the sum of the output voltages does not exceed 150Vdc.
 b) Voltages with a potential above 80Vdc are not SELV any more and can be dangerous. Such voltages must be installed with a protection against touching.
 c) The connection between two power supplies of the same type. d) Earthing of the output voltage is required when the sum of the output voltage is above 80Vdc. e) Keep an installation clearance of 10 mm (height) 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)

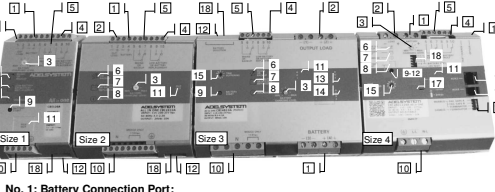
The output Load in normal mode. Mains Input Vac Voltage present, follow the charging battery dc output voltage. The minimum and maximum range stabilized are the following:
 CBI 12xx: 11 - 14.4 Vdc; 15.5 Vdc for NiCd (Without battery connected out. Voltage fixed at 12Vdc)
 CBI 24xx: 22 - 28.8 Vdc; 30 Vdc for NiCd (Without battery connected out. Voltage fixed at 24Vdc)
 CBI 48xx: 44 - 57.6 Vdc; 60 Vdc for NiCd (Without battery connected out. Voltage fixed at 48Vdc)
 All 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 not 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 I_{load} (Load = I_{bat}) in continuous operation and 3 times the rated current 3 x I_{load} (Load = 2x I_{bat}) 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	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 7.5 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	9 min	20 min	40 min	400 min
Load 20 A	No	7 min	13 min	24 min	No

Operating and Display Element:



No. 1: Battery Connection Port:

Connect the battery between pin. 3 (-) and 4 (+)
 One battery (12 Vdc) for CBI 12xx;
 Two battery (12 Vdc) connected in Series for CBI 24xx;
 Four battery (12 Vdc) connected in Series for CBI 48xx;

No. 2: Output Load:

Connect this output to the load (1 - 2+).

No. 3: Charging Level Current:

It is possible set the max recharging current for the batteries by trimmer (Charging Level). The current adjustment goes from 20% ÷ 100% of In. Set the maximum charging current between 10% and 20% of the battery; please see also data sheet of the battery.

No. 9, 12: Start From Battery Only. (No Mains Vac)

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:
 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 connection. (Not present in CBI 2410xx and CBI 48xx)
 No. 12: (Jumper on S) It is also available the same function for remote 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 CBI2410AS and CBI48AS/S. Do not leave jumper in this position, otherwise the system will discharge completely the battery. Only push button.
No. 10: Input AC Port. 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 adjust the specifications of the EN5-4 fire norm.
 Size 1, 2, 3 Size 4

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	Trickle charge
+5mV/°C x n. of Cells from -8°C to +45°C +140mV/Cell + 200mV/Cell compared to the value at 20°C	+3mV/°C x n. of Cells from 20°C to +45°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 prevent code can be signaled by 1 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 Sizes 4, connection MODBUS via RJ45 connector. See instruction MODBUS communications protocol. (CANBUS is 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

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 rotary switch 13. Buffering time is initiated when the mains is switched OFF. The LOAD output will be ON for the selected time.

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

If the switch is 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.

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: Selection Out Voltage (Size 4)

Caution: Switch off the system before Setting the Jumper.

Functional Setting	Function
Output Voltage selection	12V Output Voltage
Output Voltage selection	24V Output Voltage Default setting

Notice:

- 1 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 CBI2410AS or CBI48AS/S (/S means start with battery functions, otherwise only start with Input Mains)
- 2 Replaces the fast charge in CBI24ATB1 and CBI45ATB1 model, contact closed: back-up enabled (30 sec. Time Buffering after the Low Battery Detection), contact open Inhibit backup function (i.e. Contact on Main Switch).

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 diagnosis 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 to set predefinied 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 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 200 minute in trickle 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 trickle 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 Open Cell or Sulfated:

Every 220 minute. All In One tests of internal impedance, in trickle 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 trickle charging mode.

Check for Battery Cells in short circuit

Thanks to specific algorithms of evaluation, the CBs recognizes batteries with cells in internal short circuit. In trickle charge every 220 minute 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.

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 holding the CBI battery in Diagnostics LED. To maintain the Output Load in lower Voltage state, don't put jumper in position 5. In this case no boost charge but only Float charge.

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 the battery.
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 situations the device Shut-down the output and automatic restart when temperature inside fall.

Standards and Certifications

Electrical Safety:
 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.
EMC Standards Immunity:
 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 61000-6-2 (see data sheet for each device)
 Part 1: General Requirement.
CE In Accordance to EMC 2014/30/EU and Low voltage directive 2014/35/EU
 Approved: EN60950 /UL60950-1 and CSA C22.2 No. 60950-1-07 (Information Technology Equipment) – Safety
 In Accordance to: IEC/EN 60335-2-29 Battery chargers
 Electrical safety EN54-4: Fire Detection and fire alarm systems;
 EN 14717: Charging cable
 Emission: IEC 61000-6-4; Immunity: IEC 61000-6-2, CE

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.

Page 1 - Chapter: All in One™ CBI series: Uninterruptible Power Supply with DC output

Page 3 - Chapter: Output Load (Mains input ON)























Page 5 - Chapter: Operating and Display Element:

Page 4 - Chapter: Operating and Display Element:

Page 6 - Chapter: Operating and Display Element:

Page 7 - Chapter: Battery Care

Page 8 - Chapter: Protection Features

CBI - All in ONE	12Vdc				12/24Vdc	24Vdc				48Vdc	
											
Model	CBH23A	CBH26A	CBH210A	CBH235A	CBI2801224A	CBI243A	CBI245A	CBI2410A	CBI2420A	CBI485A	CBI4810A
INPUT DATA											
Nominal Input Voltage / Tensione d'ingresso nominale	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
Input Voltage Range / Campo di funzionamento	90 – 305Vac	90 – 305Vac	90 – 305Vac	90 – 135Vac 180 – 305Vac	90 – 135Vac 180 – 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 _i / Corrente di inserzione	≤ 36 A ≤ 5msec	≤ 36 A ≤ 5msec	≤ 36 A ≤ 5msec	≤ 80 A ≤ 5msec	≤ 16 A ≤ 5msec	≤ 36 A ≤ 5msec	≤ 36 A ≤ 5msec	≤ 36 A ≤ 5msec	≤ 42 A ≤ 5msec	≤ 80 A ≤ 5msec	≤ 42 A ≤ 5msec
Frequency / Frequenza di ingresso	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) / Assorbimento	2.8 – 1.3A	2.8 – 1.3A	2.8 – 1.3A	8.0 – 4.2A	5.5 – 3A	8.0 – 4.2A	3.3 – 2.2A	3.3 – 2.2A	2.8 – 1.3A	8.0 – 4.2A	8.0 – 4.2A
Internal Fuse / Fusibile Interno (non sostituibile)	4A	4A	4A	10A	6.3A	4A	4A	6.3A	10A	6.3A	10A
External Fuse (recommended) / Fusibile Esterno raccomandato	10A	10A	10A	16A	16A	10A	10A	16A	16A	16A	16A
OUTPUT DATA											
Output Vdc / I _n / Tensione di uscita Vdc / I _n	12Vdc – 3A	12Vdc – 6A	12Vdc – 10A	12Vdc – 35A	12Vdc 15A / 24Vdc 10A	24Vdc – 3A	24Vdc – 5A	24Vdc – 10A	24Vdc – 20A	48Vdc – 5A	48Vdc – 10A
Output Current (In)	3A	6A	10A	35A	15A 12Vdc / 10A 24Vdc	3A	5A	10A	20A	5A	10A
Dissipation Power load max (W)	15	18	25	68	28	18	25	48	68	48	68
Minimum load / Carico minimo	No	No	No	No	No	No	No	No	No	No	No
Efficiency (50% of In) / Rendimento tipico	≥ 89%	≥ 89%	≥ 89%	> 90%	> 91%	≥ 89%	≥ 89%	≥ 83%	> 90%	≥ 83%	> 91%
Short-circuit protection / Protezione contro il corto circuito	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Over Load protection / Protezione sovraccarico	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Over Voltage Output protection / Protezione sovratensione in uscita	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 / Protezione sovratemperatura	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reverse battery protection / Protezione inversione batteria	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sulfated battery check / Controllo batteria solfatata	Yes by Jumper	Yes by Jumper	Yes by Jumper	Yes by Jumper	Yes by Deep Switch	Yes by Jumper	Yes by Jumper	Yes by Jumper	Yes by Jumper	Yes by Jumper	Yes by Jumper
LOAD OUTPUT / USCITA CARICO											
Output voltage (at IN) Vdc / Tensione di uscita (a IN) Vdc	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)	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)	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) / Start up con carichi capacitivi	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 I _N = I _{load}	1.1 x I _N A ± 5%	1.1 x I _N A ± 5%	1.1 x I _N A ± 5%	1.1 x I _N A ± 5%	1.1 x I _N A ± 5%	1.1 x I _N A ± 5%	1.1 x I _N A ± 5%	1.1 x I _N A ± 5%	1.1 x I _N A ± 5%	1.1 x I _N A ± 5%	1.1 x I _N A ± 5%
Continuous current (without battery) I _{load} = I _n	3A	6A	10A	35A	15A 12Vdc / 10A 24Vdc	3A	5A	10A	20A	5A	10A
Max continuous current (with battery) I _{load} = I _n + I _{batt}	6A	12A	20A	70A	30A 12Vdc / 20A 24Vdc	6A	10A	20A	40A	10A	20A
Max current Output Load: (Main Input) I _{load} (4sec.)	9A max	18A max	30A max	105A max	max. 45A 12Vdc / 30A 24Vdc	9A max	15A max	30A max	60A max	15A max	30A max
Max current Output Load: (Back Up) I _{load} (4sec.)	6A max	12A max	20A max	70A max	max. 30A 12Vdc / 20A 24Vdc	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	No (1)	No (1)	No (1)	Yes	Yes	No	No	No	Yes	Yes	Yes
Time Buffering: (switch off output without main input)	(2)	(2)	(2)	0.5;1;3;5;10;15; 20; 30; 45;60;∞	0.5;1;3;5;10;15; 20; 30; 45;60;∞	(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	0.5;1;3;5;10;15; 20; 30; 45;60;∞
Threshold alarm Battery almost flat	10 – 11 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	20 – 21 Vdc batt	40 – 42 Vdc batt	40 – 42 Vdc batt
Protections against total discharge	9 – 10 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	19 – 20 Vdc batt	38 – 40 Vdc batt	38 – 40 Vdc batt
BATTERY CHARGER OUTPUT / USCITA CARICA BATTERIA											
Bulk charge (Typ. at I _b) / Carica Veloce	14.4Vdc	14.4Vdc	14.4Vdc	14.4Vdc	14.4Vdc / 28.8Vdc	28.8Vdc	28.8Vdc	28.8Vdc	28.8Vdc	57.6Vdc	57.6Vdc
Short circuit Element Detection / Rilevazione elemento in corto circuito	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Max.Time Boost-Bulk charge (Typ. at I _b) / Tempo massimo Carica Veloce	15h	15h	15h	15h	15h	15h	15h	15h	15h	15h	15h
Min.Time Boost-Bulk charge (Typ. at I _b) / Tempo minimo Carica Veloce	1min.	1min.	1min.	1min.	1min.	1min.	1min.	1min.	1min.	1min.	1min.
Trickle-Float charge (Typ. at I _f) / Carica di mantenimento	13.75Vdc	13.75Vdc	13.75Vdc	13.75Vdc	13.8Vdc / 27.6Vdc	27.5Vdc	27.5Vdc	27.5Vdc	27.5Vdc	55Vdc	55Vdc
Recovery Charge / Carica di recupero	2 – 9Vdc	2 – 9Vdc	2 – 9Vdc	2 – 9Vdc	2 – 10Vdc / 2 – 20Vdc	2 – 16Vdc	2 – 16Vdc	2 – 16Vdc	2 – 16Vdc	2 – 24Vdc	2 – 24Vdc
Turn-On delay after applying mains voltage / Accensione con tensione di rete	1sec. Max	1sec. Max	1sec. Max	1sec. Max	3sec. Max	1sec. Max	1sec. Max	1.5sec. Max	1sec. Max	1.5sec. Max	1sec. Max
End of charging current (Bulk charge)	0.3A	0.3A	0.3A	0.3A	6% of charging current limiting	0.3A	0.3A	0.3A	0.3A	0.3A	0.3A
Charging max I _{batt} / Corrente max. di Carica	3A ± 5%	6A ± 5%	10A ± 5%	35A ± 5%	15A ± 5% 12Vdc / 10A ± 5% 24Vdc	3A ± 5%	5A ± 5%	10A ± 5%	20A ± 5%	5A ± 5%	10A ± 5%
Charging current Limiting I _b (I _{batt}) / Limitazione Corrente di Carica	20 ÷ 100 % / I _{batt}	20 ÷ 100 % / I _{batt}	20 ÷ 100 % / I _{batt}	10 ÷ 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}
Jumper Config.Type Battery (NiCd optional) / Configurazione Tipo Batteria	2.23 V/cell Open Lead, 2.25 V/cell Sealed Lead, 2.27 V/cell Sealed Lead, 2.3 V/cell gel; NiCd 1.5V										
Quiescent Current / Consumo da batteria max.	≤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
Characteristic Curve / Caratteristiche di Carica	IUoUo, Automatic, 3 stage / IUoUo, Automatico a 3 Stadi										
SIGNAL OUTPUT (RELAY) / SEGNALAZIONE RELÈ USCITA											
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											
Temp. Charging probe / Carica compensata in temperatura	Yes RJ45	Yes RJ45	Yes RJ45	Yes RJ45	Yes RJ11	Yes RJ45	Yes RJ45	Yes RJ45	Yes RJ45	Yes RJ45	Yes RJ45
Parallel connection / Connessione in parallelo	No	No	No	Yes	No	No	No	No	Yes	No	Yes
MODBUS	No	No	No	Yes	Yes	No	No	No	Yes	No	Yes
CLIMATIC DATA											
Ambient Temperature operation / Temperatura Ambiente di Lavoro	-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 / Temperatura max. Magazzino	-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 / Umidità	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 / Raffreddamento	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) / Tensione di Isolamento (IN / OUT)	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac
Isolation Voltage(IN / PE) / Tensione di Isolamento(IN / TERRA)	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac
Isolation Voltage(OUT / PE) / Tensione di Isolamento(OUT/TERRA)	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac
Protection Class (EN/IEC 60529) / Protezione Classe	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) / Affidabilità	> 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 / Grado d'inquinamento ambientale	2	2	2	2	2	2	2	2	2	2	2
Connection Terminal Blocks Screw Type / Dimensione morsetti	2.5mm (24-14 AWG)	2.5mm (24-14 AWG)	2.5mm (24-14 AWG)	4mm (30-10 AWG)	4mm (30-10 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)	4mm (30-10 AWG)
Protection class (with PE connected) / Grado di protezione (con cavo di terra collegato)	I	I	I	I	I	I	I	I	I	I	I
Dimension (w-h-d)/Dimensioni (l-h-p) mm	65x115x135 mm	65x115x135 mm	65x115x135 mm	150x115x135 mm	115x115x135 mm	65x115x135 mm	65x115x135 mm	100x115x135 mm	150x115x135 mm	100x115x135 mm	150x115x135 mm
Weight / Peso	0.60 Kg approx	0.60 Kg approx	0.60 Kg approx	1.55 Kg approx	0.85 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 / Conformità ed Approvazioni	CE 	CE 	CE 	CE 	CE 	CE 	CE 	CE 	CE 	CE 	CE 

(1) - Options to be defined by Order/S (ex: CBIXXAS), 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.