CB Type Intelligent Battery Chargers

With the CB Battery Charger Line, Altech offers a highly reliable battery management solution. Operating at single phase Input Voltages of 115-230-277 VAC, the devices supply an Output of 12VDC and up to 35A or 24VDC and up to 20A.

Equipped with microcontrollers, the CB line offers fully automated multi-stage charging that will expand the battery's life significantly. Several diagnostic and monitoring features ensure easy handling and a high amount of transparency during daily operation.

Altech's CB line battery chargers are based on the switching technology which allows much higher efficiency as well as smaller and lighter devices. Additionally, several standard safety and protection features ensure safe installation and operation.

Features:
- Fully automated charging
- Three charging modes
- Compact, rugged metal case
- Available in 12VDC and 24VDC
- Suitable for most common battery types
- Adjustable charging current
- Easy battery diagnosis and fault identification either by LED or external devices connected to fault status contacts
- High efficiency up to 91% through switching technology
- Several output protection features such as short circuit, overload, deep battery discharge etc.
- DIN rail mounting
- Small size
- 3 year warranty

Battery Selection Chart

<table>
<thead>
<tr>
<th>Battery type</th>
<th>1.2 Ah</th>
<th>3.2 Ah</th>
<th>7.2 Ah</th>
<th>12 Ah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load 1.5 A</td>
<td>20</td>
<td>60</td>
<td>200</td>
<td>400</td>
</tr>
<tr>
<td>Load 3 A</td>
<td>8</td>
<td>30</td>
<td>120</td>
<td>240</td>
</tr>
<tr>
<td>Load 5 A</td>
<td>3</td>
<td>15</td>
<td>55</td>
<td>100</td>
</tr>
<tr>
<td>Load 7.5 A</td>
<td>2</td>
<td>10</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Load 10 A</td>
<td>-</td>
<td>7</td>
<td>20</td>
<td>45</td>
</tr>
<tr>
<td>Load 12 A</td>
<td>-</td>
<td>3</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>Load 15 A</td>
<td>-</td>
<td>-</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>Load 20 A</td>
<td>-</td>
<td>-</td>
<td>7</td>
<td>13</td>
</tr>
</tbody>
</table>

BUFFERING (MINUTE) TIME
CB1224xA - Smart Battery Charger

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

The CB series is a “Switching technology” and “Battery Care philosophy” since many years parts of the know-how ADEL system, led to the development of this advanced multi-stage battery charging, completely automatic and suited to meet the most advanced requirements of battery manufacturers. The Battery Care concept is based on algorithms that implement rapid and automatic cycle of battery 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, polarity connection disconnection of the battery, they can easily be detected and removed by help of BltCode of Diagnostic Led; during the installation and after sell. Each device is suited for all battery types, jumper selection sets a predefined curves for: Open Lead Acid, Sealed Lead Acid, Gel, Ni-Cd and Ni-Mh. A rugged casing with bracket for DIN rail mounting provide IP20 protection degree.

Main Characteristics

- Output Battery: charging 24 Vdc; 3–5 A; 12 Vdc; 5–6 A
- Soldered for the following battery types: Open Lead Acid, Sealed Lead Acid, lead Gel and Ni-Cd-Ni-Mh (Option)
- Automatic diagnostic of battery status. Charging curve j8/30, considered in an empirical current Battery Life Test function (Battery Care)
- (Volt/Cycle)
- Three charging levels: Boost, Trickle and Recovery
- Protected against short circuit, Over load and inverted polarity
- Signal output (contact free) for discharged or damaged battery
- Protection degree IP20 - DIN rail, Space saving

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 accordance with UL308. The device must have a suitable isolating facility outside the power supply unit, via which can be switched to earth. Danger of fatal injury!

Connection (terminal and wirings):

Security: The following cable cross-sections may be used:

- Solid
- Stranded

In: 0.2–2.5
- 0.2–2.5
- 24–14
- 0.5–1.6 mm
- 7 mm

Out: 0.2–2.5
- 0.2–2.5
- 24–14
- 0.5–1.6 mm
- 7 mm

Signal output true table:

- Battery No connected 2 Blink/pause
- CB set for 24Vdc and battery 12Vdc) 1 Blink/pause
- Boost 2 Blink/sec OFF
- Trickle 1 Blink/ 2 sec OFF
- Recovery (*) 5 Blink/sec OFF

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.

Notice

1. Be careful, in NiCd-NiMH Option, the Sealed Lead High charging current is deleted.

2. This function is a hot swap (is possible to enable or disable with mains on).

No. 3: Signal Ports (output Isolated):

- Connections for Fault Alarm Relay: Low Battery, Fault connections systems, Battery replacement. Contact: 3.4.5
- Relay Contact Rating:
  - Max.DC1: 30 Vdc 1 A
  - AC1: 60 Vac 1A

Output Voltage Configuration

The settings must be done with mains off. This jumper sets the output voltage of the CB selectable. Batteries must be connected at their correct input voltage; if connected is not correct voltage battery the device shows the fault indication of 1 blink.

No. 6: Enable Power Supply

This function allows the Battery charger to work like a Power Supply. To enable this function the operator must do the following steps: connect a battery on terminal blocks, switch on mains. A load can be connected in parallel at the battery on the same terminal blocks. The output voltage range is 2.2V/toCell to 2.4V/toCell and the microcontroller do a normal battery recharging cycle. When the diagnosis led shows the status of charging (trickle, boost or recovery) for the battery, is possible to disconnect the battery and the output voltage on the terminal blocks never falls down. When this function is enabled, the Auto-Diagnosis of the Battery is disabled (so the fault indication of 1 blink will never be shown).

Note: Connect the battery between pins 1 and 2 (–). One battery (12Vdc) for 12 Vdc Output; Two battery (12Vdc) for 24 Vdc Output.

No. 8: Display Signals

- Led Battery Fault connections systems, Battery Fault.
- Led Diagnose. Diagnosis of the system through “biting” signal code

No. 9: Charging Level Current:

It is possible to set the max charging current for the batteries by trimmer (Charging Level). The current adjustment goes from 10% to 100% of In. Set the maximum charging current between 15% and 20% of the battery capacity.

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 CB device. The type of charging is Voltages stabilized and Current stabilized IUo.

For charging modes is identified by a flashing code on a Diagnostic LED.

To maintain the Output load in lower Voltage state, don’t put in position 4, in this case no boost charge but only Float charge.

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. The Real Time Auto-Diagnostic system, monitoring battery faults such as, elements in short circuit, accidental reverse polarity, polarity connection disconnection of the battery, they can easily be detected and removed by help of BltCode of Diagnostic 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 and Ni-Mh. It is possible to charge or add other charging curves connecting the device to a portable PC.

Warning: Switch off the system before Setting the jumper.

Page 3 - Chapter: Battery Care
CB1224xA: Smart Battery Charger

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

The CB series is a "Switching technology" and "Battery Care philosophy" since many years parts of the know-how ADEL system, led to the development of this advanced multi-stage battery charging, completely automatic and suited to meet the most advanced requirements of battery manufacturers. The Battery Care concept is based on algorithms that implement rapid and automatic cycle of battery charging, battery charge optimization during time, flat batteries recovery during installation and operation. The Real Time Auto-Diagnostic system, monitoring battery faults such as, elements in short circuit, accidental reverse polarity, 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, jumper selection sets a predefined curves for: Open Lead Acid, Sealed Lead Acid, Gel, Ni-Cd and Ni-Mh. A rugged casing with bracket for DIN rail mounting provide (P20) protection degree.

Main Characteristics

- Output: Battery charging: 24 Vdc; 3 – 5 A; 12 Vdc; 5 – 6 A
- Sealed for the following battery types: Open Lead Acid, Sealed Lead Acid, lead Gel and Ni-Cd-Ni-Mh (Option)
- Automatic diagnostic of battery status. Charging curve J0,J1,J2, constant voltage and constant current Battery Life Test function (Battery Care)
- (Volt/Cell)
- Three charging levels: Boost, Trickle and Recovery
- Protected against short circuit, Over Load and inverted polarity
- Signal output (contact free) for discharged or damaged battery
- Protection degree IP20 - DIN rail. Space saving

Safety and warning notes

WARNING – Explosion Hazard Do not connect Equipment unless power has been switched off or the area is known to be non-combustible

WARN – 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. The device must have a suitable isolating facility outside the power supply unit, via which can be switched to the mains. Danger of fatal Injury!

Connection (terminal and wirings):

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

<table>
<thead>
<tr>
<th>Solid (mm²)</th>
<th>Stranded (mm²)</th>
<th>AWG</th>
<th>Stripping Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>In: 0.2 – 2.5</td>
<td>0.2 – 2.5</td>
<td>24 – 16</td>
<td>0.5 – 0.6 Nm</td>
</tr>
<tr>
<td>Out: 0.2 – 2.5</td>
<td>0.2 – 2.5</td>
<td>24 – 16</td>
<td>0.5 – 0.6 Nm</td>
</tr>
<tr>
<td>Signal: 0.2 – 2.5</td>
<td>0.2 – 2.5</td>
<td>24 – 16</td>
<td>0.5 – 0.6 Nm</td>
</tr>
</tbody>
</table>

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.

No. 5: Battery Management Configurations

Preliminary Operations: One device for all battery types. Completely automatic, all devices are suitable to charge most batteries types than to User Selectable charging curves. They can change open lead acid, sealed lead acid, Gel and Ni-Cd-Ni-Mh batteries. It is possible to change or add other charging curves connecting the device to a portable PC.

Notice

1. Be careful, in NiCd-NiMh Option, the Sealed Lead High charging curve is deleted.
2. The device must have a suitable isolating facility outside the power supply unit, via which can be switched to the mains.
3. Connections for Fault Alarm Relay: Low Battery, Fault connections systems, Battery replacement. Contact: 3,4,5 (No.7)

Safety Precaution

- led off
- led On
- led off
- led on

No. 6: Enable Power Supply

This function allow at the Battery Charger to work like a Power Supply. To enable this function the operator must do the following steps: connect a battery on terminal blocks, switch on mains. A load can be connected in parallel at the output battery, if a battery is not connected at the CB, on the terminal blocks “Output Battery” there is no voltage.

No. 7: Display Signals

No. 8: Battery Fault connections systems, Battery Fault.

No. 9: Charging Level Current:

It is possible set the max recharging current for the batteries by trimmer (Charging Level). The current adjustment goes from 10% to 100% of In. Set the maximum charging between 10% and 20% of the battery capacity.

**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 CB device. The type of charging is Voltag stabilized and Current stabilized UxU0. For charging modes 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 4, in this case no boost charge but only float Charging.

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 damage analysis in long term. The Real Time Auto-Diagnostic system, monitoring battery faults such as, elements in short circuit, accidental reverse polarity, 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. They guarantee 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 simulation circuit with algorithms of evaluation of the detected parameter, is able to recognize batteries with a short-circuited element. Battery test automatic:

Every time a battery will be connected to the Battery Charger, the device will do followings check: reverse polarity, wrong battery capacity (like batteries 24 – 35V) or higher with Jumper 5 in not present + Battery charger for 12Vdc. After 120 minutes, with jumper in pos. 5 (24 Vdc output configuration) the device makes the test of wrong wiring connected batteries (12Vdc).

Every 240 minutes, make the test element in short circuit.
The CB series is a “Switching technology” and “Battery Care philosophy” since many years parts of the know-how ADEL system, led to the development of this advanced multi-stage battery charging , completely automatic and suited to meet the most advanced requirements of battery manufacturers. The Battery Care concept is based on algorithms that implement rapid and automatic cycle of battery 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 Bitle Code of Diagnostic Led; during the installation and after sell. Each device is suited for all battery types, jumper selection sets a predefined curvatures for: Open Lead Acid, Sealed Lead Acid, Gel, Ni-Cd and Ni-Mh. A rugged casing with bracket for DIN rail mounting provide P2D protection degree.

General Description

- Output: Battery charging: 24 Vdc; 3 – 5 A; 12 Vdc; 5 – 6 A
- Suited for the following battery types: Open Lead Acid, Sealed Lead Acid, Lead Gel and Ni-Cd-Ni-Mh Option.
- Automatic diagnostic of battery status. Charging curve (Led, buzzer), control of battery voltage and current. Real time Battery Life Test function (Battery Care).
- (Volts/Cycle)
- Three charging levels: Boost, Trickle and Recovery
- Protected against short circuit, Over Load and inverted polarity
- Signal output (contact free) for discharged or damaged battery
- Protection degree P2D - DIN rail. Space saving

Main Characteristics

- 3 Charging levels: Boost, Trickle and Recovery
- Battery Care 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 battery polarity connection, disconnection of the battery, they can easily be detected and removed by help of Bitle Code of Diagnostic Led; during the installation and after sell. Each device is suited for all battery types, jumper selection sets a predefined curvatures for: Open Lead Acid, Sealed Lead Acid, Gel, Ni-Cd and Ni-Mh. A rugged casing with bracket for DIN rail mounting provide P2D protection degree.

Safety and warning notes

WARNING – Explosive Hazard Do not disconnect Equipment unless power has been switched off or the area is known to be non-combustible.

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. The device must have a suitable isolating facility outside the power supply unit, via which can be switched to disable. Danger of fatal Injury!

Connection (terminal and wires):

- The following cable cross-sections may be used:
- The following cable cross-sections may be used:
- Battery or system Fault? NO
- YES
- 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. 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 Bitle Code of Diagnostic Led; during the installation and after sell. Each device is suited for all battery types, jumper selection sets a predefined curvatures for: Open Lead Acid, Sealed Lead Acid, Gel, Ni-Cd and Ni-Mh. A rugged casing with bracket for DIN rail mounting provide P2D protection degree.

Notice

1. Be careful. In NiCd-NiMh Option, the Sealed Lead High charging current is deleted.
2. This function is a hot swap (is possible to enable or disable with mains on).
3. No. 3: Signal Ports (output Isolated):
   - Connections for Fault Alarm Relay: Low Battery, Fault connections systems, Battery replacement. Contact: 3, 4, 5
   - Chart:
   - Led Diagnosis. Diagnosis of the system through “blinking code” signal

No. 1: Input AC Port pin. L – N: –

No. 2: Battery Management Configurations

- No. 1: Input AC Port pin. L – N: –
- No. 2: Battery Management Configurations

- Preliminary Operations: One device for all battery types. Completely automatic, all devices are suitable to charge most batteries types. The CB device connects to User Selectable charging curves. They can change open lead acid, sealed lead acid, Gel and Ni-Cd, Ni-Mh batteries. 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.

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 keeping the CB device. The type of charging is Voltage stabilized and Current stabilized.

Charging levels

- Voltage stabilized charging: 12Vdc, over 14 Vdc 9 Blink/pause

Charging Type

- State
- Battery Fault LED
- Alarm
- Battery Care
- Alarm
- Battery Care

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. 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 Bitle Code of Diagnostic Led; during the installation and after sell. Each device is suited for all battery types, by means of jumpers it is possible setting predefined curvatures for: Open Lead Acid, Sealed Lead Acid, Gel, Ni-Cd-Ni-Mh 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 simulation circuit with algorithms of evaluation of the detected parameter, is able to recognize batteries with a short-circuited element. Battery test automatic: All monitored batteries are evaluated.

- Every time a battery will be connected to the Battery Charger, the device will do followings check: reverse polarity battery, wrong battery connection (like batteries 24 – 36Vdc or higher) with jumper in 5 no present + Battery charger for 12Vdc. After 120 minutes, with jumper in pos. 5 (24 Vdc Output configuration) the device make the test of charging connection by checking the battery configuration.

- Every 240 minutes, make the test element in short circuit.
CB1224A: Smart Battery Charger

General Description

The CB series is a "Switchover technology" and "Battery Care philosophy" since many years parts of the know-how ADEL system, led to the development of this advanced multi-stage battery charging, completely automatic and suited to meet the most advanced requirements of battery manufacturers.

The Battery Care concept is based on algorithms that implement rapid and automatic cycle of battery 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, polarity connection detection of the battery, they can easily be detected and removed by help of Switch Code of Diagnostic Led: during the installation and after sell. Each device is suited for all battery types, jumper selection sets a predetermined curves for: Open Lead Acid, Sealed Lead Acid, Gel, Ni-Cd and Ni-Mh. A rugged casing with bracket for DIN rail mounting provide (IP20) protection degree.

Main Characteristics

- Output Battery: charging 24 Vdc: 3 – 5 A, 12 Vdc: 5 – 6 A
- Suited for the following battery types: Open Lead Acid, Sealed Lead Acid, Lead Gel and Ni-Cd-Ni-Mh (Option)
- Automatic diagnostic of battery status. Charging curve (U担当, constant voltage and constant current Battery Life Test function (Battery Care)
- (Volt/Cycle)
- Three charging levels: Boost, Trickle and Recovery
- Protected against short circuit, Over Load and inverted polarity
- Signal output (contact free) for discharged or damaged battery
- Protection degree IP20 - DIN rail, Space saving

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-combustible.

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 equipment when it is live. The device must be installed in accordance with UL508. The device must have a suitable isolating facility outside the power supply unit, via which can be switched to the device. Danger of fatal injury!

Connection (terminal and wqings):

Connection (wiring): The following wiring is used for the connection of the terminal block:

- Solid (mm²)
- Stranded (mm²)
- AVG
- Stripping Length
- Length of Phase L, N, PE
- Length of Phase L, N, PE

In: 0.2 – 2.5
Out: 0.2 – 2.5
Signal: 0.2 – 2.5

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.

Notice

1. Be careful, in NiCd-NiMh Option, the Sealed Lead High charging curve is deleted.
2. This function is a "Hot Swap" (is possible to enable or disable with mains on).
3. Be careful, in NiCd-NiMh Option, the Sealed Lead High charging curve is deleted.
4. Enter the value in [NCd-Nih Option] to be defined by Order. If profile depth detected is defined fast charge is terminated after 20 min. General and-of-charging timeout set to 16 hours. Trickle charge current is regulated at 10% of max current corresponding to trimmer position. Charging current must be set at least at 30% of nominal battery capacity (0.3 C).
5. This function is a hot swap (is possible to enable or disable with mains on).
6. Be careful, in NiCd-NiMh Option, the Sealed Lead High charging curve is deleted.

No. 3: Signal Ports (output isolated):

- Connections for Fault Alarm Relay: Low Battery, Fault connection systems, Battery replacement. Contact: 3,4,5
- Relay Contact Rating: Max:DC 1: 30 Vdc 1 A, AC 60 Vdc 1 A – Resistive load (EN 60947-4-1)

No. 4: Battery Connection Port:

Connect the battery between pin (1) and (7) (– –) One battery (12 Vdc) for 12 Vdc Output: Two battery (12 Vdc) for 24 Vdc Output:

No. 5: Output Voltage Configuration:

This settings must be do with mains off. This jumper set the voltage of the batteries connected at the CB, is most important to check the correct voltage on batteries. If it is connected a wrong battery the device show the fault indication of 1 blink.

No. 6: Enable Power Supply

This function allows at the Battery Charger to work like a Power Supply. To enable this function the operator must do the following steps: connect a battery on terminal blocks, switch on mains. A load can be connected in parallel in the battery on the same terminal blocks. The output voltage range is 2.20V/Dcell to 2.40V/Dcell and the microprocessor do a normal battery recharging cycle. When the diagnosis led show the status of charging (trickle, boost or recovery) for the battery, is possible to disconnect the battery and the output voltage on the terminal blocks never falls down. When this function is enabled, the Auto Diagnosis of the Battery are disabled (so the fault indication: 1, 2, 3, 4, 5 blinks never will be shown).

No. 7: Display Signals

No. 8: Battery Fault connections systems, Battery Fault.

No. 7: LED Display (state of the battery)

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.

The Real Time Auto Diagnostic system, monitoring battery faults such as, elements in short circuit, accidental reverse polarity, polarity connection detection of the battery, they can easily be detected and removed by help of Switch Code of Diagnostic Led: during the installation and after sell. Each device is suited for all battery types, by means of jumpers is possible setting predetermined curves for: Open Lead Acid, Sealed Lead Acid, Gel, Ni-Cd-Ni-Mh. They guarantee 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 simulation circuit with algorithms of evaluation of the detected parameter, is able to recognize batteries with a short-circuited element. Battery test Auto Diagnostic System.

Every time a battery will be connected to the Battery Charger, the device will do follows check: reverse battery polarity, wrong battery connection (like batteries 24 – 50Vdc or higher) with Jumpers in 5 position = Battery charger for 12Vdc. After 120 minutes, with jumper in pos. 5 (24 Vdc output configuration) the device make the test of wrong connected battery like 12Vdc.

Every 240 minutes, make the test element in short circuit.

No. 1: Input AC Port pin. L – N – AC

No. 2: Battery Management Configurations

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.

The Real Time Auto Diagnostic system, monitoring battery faults such as, elements in short circuit, accidental reverse polarity, polarity connection detection of the battery, they can easily be detected and removed by help of Switch Code of Diagnostic Led: during the installation and after sell. Each device is suited for all battery types, by means of jumpers is possible setting predetermined curves for: Open Lead Acid, Sealed Lead Acid, Gel, Ni-Cd-Ni-Mh. They guarantee 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 simulation circuit with algorithms of evaluation of the detected parameter, is able to recognize batteries with a short-circuited element. Battery test Auto Diagnostic System.

Every time a battery will be connected to the Battery Charger, the device will do follows check: reverse battery polarity, wrong battery connection (like batteries 24 – 50Vdc or higher) with Jumpers in 5 position = Battery charger for 12Vdc. After 120 minutes, with jumper in pos. 5 (24 Vdc output configuration) the device make the test of wrong connected battery like 12Vdc.

Every 240 minutes, make the test element in short circuit.
Diagnostic Type Checks:

Check for accidental disconnection of the battery cables:
The device detects accidental disconnection and immediately switched off the output power.

Battery not connected:
If the battery is not connected no output power.

Reverse Polarity check:
If the battery is connected with inverted polarity, the device 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 full, the device automatically switch in trickle 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 trickle charge every 4 hours test of element in short circuit.

Diagnosis of battery and device:
All CB 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 with an internal 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 overloads.

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 output current (see the technical data).

Thermal behaviour:
Surrounding air temperature 5°C. For ambient temperatures of over 5°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 these situations the device Shut-down the output and automatic restart when temperature inside fall.

Standards and Certification:

Electrical Safety:
Assembling device: 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:

EMC Standards Immunity:
EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5.

EMC Standards Emission:
EN 61000-6-1, EN 61000-6-1-3, EN 61000-6-3, EN 61000-6-4-2 (see data sheet for each device).

Standards Conformity:
Safety of Electrical Equipment Machines: EN 60204-1.

The CE mark in accordance to EMC 2004/108/EC and Low voltage directive 2006/95/EC.

Norms and Certifications:
In Conformity to: UL1236, IEC/EN 60335-2-29 Battery chargers; EN60950 / UL1950; Electrical safety EN54-4, Fire Detection and Fire alarm systems; EN60364-4-1; EMC Directive, 2004/108/EC (Low Voltage); DIN41773 (Charging cycle); Emission: IEC 61000-6-4; Immunity: IEC 61000-6-2. CE.
Diagnostic Type Checks:

- **Check for accidental disconnection of the battery cables:**
  - The device detects accidental disconnection and immediately switched off the output power.

- **Battery not connected:**
  - If the battery is not connected no output power.

- **Reverse Polarity check:**
  - The device detects a battery with inverted polarity, and it is automatically protected.

- **Test of battery voltage connections:**
  - The device detects batteries with wrong polarity and connection of load in inverted mode.

- **End of Charge check:**
  - When the battery 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 recognize batteries with cells in internal short circuit.

- **Diagnosis of battery and device:**
  - All CB 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 with an internally fuse. If the internal fuse is activated, it is mostly 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 overloads.

- **Inversion polarity:** the module is automatically protected against inversion of battery polarity and connection of load in inverted.

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

**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. There is more information on the technical data.

- **Over temperature conditions:**
  - “worst case”: in these situations the device Shuts down the output and automatic restart when temperature inside fall.

**Standards and Certification**

- **Electrical Safety:**
  - Assembling device: 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 60065-1. 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 61000-3-2 (see data sheet for each device)

- **Conformity:**
  - Safety of Electrical Equipment Machines: EN 60204-1.

  - CE Mark: According to EMC 2004/108/EC and Low voltage directive 2006/95/EEC.

- **Norms and Certifications**
  - In Conformity to: UL1236, IEC/EN 60335-2-29 Battery chargers; EN60950 / UL1950; Electrical safety EN54-4: Fire Detection and Fire alarm systems, EN3836/EEC EMC Directive, 2006/95/EC (Low Voltage), DIN41773 (Charging cycle), Emission: IEC 61000-6-4; Immunity: IEC 61000-6-2; CE.

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**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 connection. Depending on the ambient temperature and load of the device, the temperature of the housing can become very high.

**Mounting Steps:** 1, 2, 3, 4.

**Removing Steps:** 4, 3, 2, 1.

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**Rail Mounting Diagram:**

Step 1: Mounting

Step 2: Removing

Step 3: Mounting

Step 4: Removing
### CB Battery Charger

#### Multivoltage 12 – 24Vdc

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input (Volt)</strong></td>
<td>115 – 230 – 277Vac</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>CB12243A</td>
</tr>
</tbody>
</table>

#### INPUT DATA

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Input Voltage</td>
<td>115 – 230 – 277Vac</td>
</tr>
<tr>
<td>Input Voltage Range</td>
<td>90 – 305Vac</td>
</tr>
<tr>
<td>Input Current (Vs and in Load)</td>
<td>≤ 14 A / 6µsec</td>
</tr>
<tr>
<td>Frequency</td>
<td>47 – 63 Hz ±6%</td>
</tr>
<tr>
<td>Input Current</td>
<td>1.4 – 0.7A</td>
</tr>
</tbody>
</table>

#### OUTPUT DATA

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Vdc</td>
<td>14.4Vdc (12Vdc)</td>
</tr>
<tr>
<td>Min. load</td>
<td>5mA</td>
</tr>
<tr>
<td>Efficiency</td>
<td>95% to 25°C</td>
</tr>
</tbody>
</table>

#### BATTERY CHARGER OUTPUT / USCITA CARICA BATTERIA

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boost – Bulk charge (Typ. at IN)</td>
<td>14.4Vdc (12Vdc)</td>
</tr>
<tr>
<td>Max. Time Boost-Bulk charge (Typ. at IN)</td>
<td>15h</td>
</tr>
<tr>
<td>Min. Time Boost-Bulk charge (Typ. at IN)</td>
<td>4 min</td>
</tr>
<tr>
<td>Trickle-Float charge (Typ. at IN)</td>
<td>13.75Vdc (12Vdc)</td>
</tr>
<tr>
<td>Recovery Charge</td>
<td>9Vdc</td>
</tr>
<tr>
<td>Suggested Battery Type</td>
<td>12Vdc or 24Vdc</td>
</tr>
</tbody>
</table>

#### JUMPER CONFIGURATION

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Type</td>
<td>1 elem.</td>
</tr>
<tr>
<td>Power Supply Function</td>
<td>Yes</td>
</tr>
<tr>
<td>Boost Charge Enable</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### CLIMATIC DATA

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient Temperature operation / Temperatura Ambiente di Lavoro</td>
<td>-25 – +70°C</td>
</tr>
<tr>
<td>De rating T² + 30°C / De rating T² + 30°C</td>
<td>50° 2.5% / 50° 2.5%</td>
</tr>
</tbody>
</table>

#### GENERAL DATA

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolation Voltage (IN / OUT) / Tensione di isolamento (IN / OUT)</td>
<td>3000Vac</td>
</tr>
<tr>
<td>Isolation Voltage (IN / PE) / Tensione di isolamento (IN / TERRA)</td>
<td>1500Vac</td>
</tr>
<tr>
<td>Isolation Voltage (OUT / PE) / Tensione di isolamento (OUT / TERRA)</td>
<td>900Vac</td>
</tr>
<tr>
<td>Protection Class</td>
<td>IP 30</td>
</tr>
<tr>
<td>Pollution Degree Environment / Grade d'impianto ambientale</td>
<td>2</td>
</tr>
</tbody>
</table>

#### CONNECTION DIAGRAM / SCHEMA DI CONNESSIONE

(1) - Depend on jumper selection