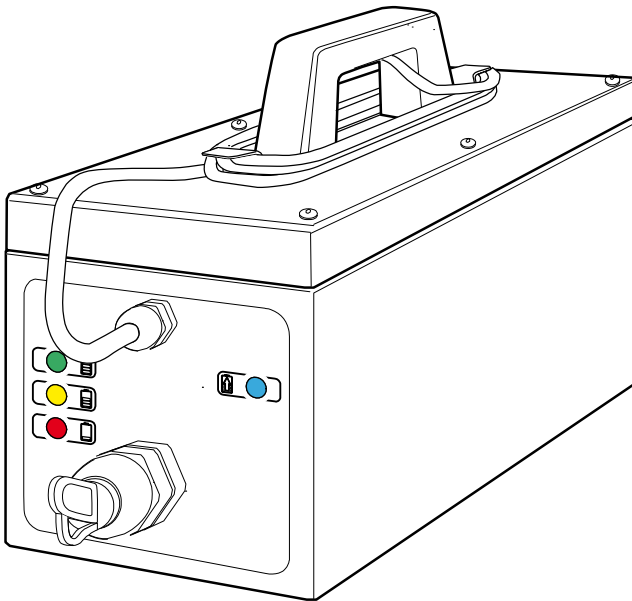


# MBSU-2

## Mains & Battery Supply Unit



***MBSU-2*** is a portable and compact battery back-up unit and charger designed to supply DC voltage to CEIA equipment where mains is not available or as UPS in installations requiring continuous operations .

*The device is extremely easy to use, and provides indication of the battery level and charging status.*

# Instructions

## ATTENTION!

**READ THESE INSTRUCTIONS BEFORE WORKING WITH THE DEVICE**  
CEIA can not be held responsible for direct and/or indirect damage to persons and/or property arising from failure to observe these instructions.

## *Installation, Use and Maintenance: General Warnings*

- Read this manual carefully before installing, operating or carrying out maintenance on the device. Keep this booklet in a safe place for future reference.
- Follow the instructions contained in this manual for all operations relating to installation, use and maintenance of the device. CEIA cannot be held responsible for any damage resulting from procedures which are not expressly indicated in this manual.
- Whenever there is any suggestion that the level of protection has been reduced, the device should be taken out of service and secured against any possibility of unintentional use, and authorised service technicians should be called.  
The level of protection is considered to have been reduced when:
  - the device shows visible signs of deterioration;
  - the device does not operate correctly;
  - the device has been stored for a long period in sub-optimal conditions;
  - the device has suffered severe stress during transport;
  - the inside of the device has come into contact with liquids.
- Choose the installation site carefully. Avoid placing the device in unventilated areas or in places that are close to sources of heat. In addition, avoid places that are subject to vibrations, dust, humidity, rain and excessively high or low temperatures.
- Lead battery maximum temperature range is specified from  $-15^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  by the manufacturer.
- Handle the device with care and without excessive force during installation, use and maintenance
- Before powering up the device, check that the mains power supply voltage corresponds to the voltage shown on the device's electrical specifications plaque. **The use of a different mains voltage may damage the equipment!**
- The device must be connected to a power supply circuit fitted with a switch or other device which allows the power to be cut off.
- If the device is to be powered via an external autotransformer to regulate the voltage, ensure that the common terminal of the autotransformer is connected to the neutral of the power-supply circuit.
- The power-supply plug of the device must only be inserted into a socket fitted with an earth/ground connection. Any break in the safety conductor, either inside or outside the device, or disconnection of the earth/ground safety terminal, will render the device dangerous. Intentional cutting or disconnection is strictly forbidden.
- The device must be disconnected from all power sources before undergoing any maintenance or cleaning, and before being moved.
- Always remove the plug by hand when disconnecting the power supply cable, never by pulling on the cable. Do not disconnect the power-supply cable from the side of the battery charger without first removing the plug from the socket!
- To prevent damage by lightning, disconnect the power supply cable during thunderstorms.
- This device contains electrical and electronic components, and may therefore be susceptible to fire. Do not install in explosive atmosphere or in contact with inflammable material. Do not use water or foam in the case of fire when the device is powered up
- Do not use in an explosive atmosphere. Avoid contact with inflammable or explosive material.
- Keep the device horizontal to avoid it falling over if accidentally knocked.

- When in use, the device must be stable and not subject to vibrations or accidental movement. All connecting cables must be properly fixed and protected, so as to achieve the best performance from the device and avoid accidental injury to people who might trip over them
- Carry out the periodic maintenance regularly (see section on Maintenance). Do not wash the inside of the device with water, liquid detergents or chemical substances. Use a slightly moist, non-abrasive cloth for cleaning.
- Any damaged parts of the device should be replaced by original components only.
- Read the chapter on “Maintenance” carefully before calling the service centre. Whatever the problem, only specialised service personnel authorised to work with CEIA equipment should be called.
- Any maintenance or repair involving the device being opened while powered should be avoided as far as possible: if this becomes inevitable, the operation must be carried out only by qualified personnel who are fully aware of the risks involved.

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## ***Safety warnings regarding the battery***

This product contains lead acid, sealed, maintenance free batteries. This kind of batteries, if handled by non-experienced personnel, can cause electric shock or shortcircuit.

- Do not dispose of batteries in a fire. The batteries may explode.
- Do not open or mutilate batteries. They contain an electrolyte that is toxic and harmful to the skin and eyes.
- To avoid personal injury due to energy hazard, remove wrist watches and jewelry such as rings when replacing the batteries. Use tools with insulated handles.
- Replace batteries with the same number and type of batteries as originally installed in the equipment.

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## ***Replacement and recycling/disposal of the battery***

The batteries cannot be disposed as an urban waste, but must be treated in conformity with applicable regulations:

- Europe: dispose/recycle according to the procedures specified by 2006/66/CE European Directive; any violation is indictable with financial sanctions as established into 2006/66/CE European Directive and applicable regulations.
- Other countries: dispose/recycle according to the local regulations applicable to battery disposal.



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## ***Safety warnings regarding the equipment***

Use this device only to supply CEIA equipment compatible to its output voltage range. Using this device for any other purpose is forbidden.

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## ***Applicable Regulations***

This product complies with the requirements of the EMC Directive 2004/108/EC.

- EN 61000-6-1:2007 Electromagnetic compatibility (EMC) -- Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
- EN 61000-6-3:2007 Electromagnetic compatibility (EMC) -- Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments

This product complies with the requirements of the Low Voltage Directive 2006/95/EC.

- EN 61010-1:2001 Safety requirements for electrical equipment for measurement, control, and laboratory use -- Part 1: General requirements

## Contents

Instructions .....	2
Installation, Use and Maintenance: General Warnings .....	2
Safety warnings regarding the battery .....	3
Replacement and recycling/disposal of the battery .....	3
Safety warnings regarding the equipment .....	3
Applicable Regulations .....	3
Warranty .....	4
Operating Principle .....	5
Description .....	5
Connections .....	7
Instructions for Use .....	9
CEIA equipment Operation .....	9
Battery Charging .....	9
AC Line Loss / Battery Charge indication .....	9
Indications during use .....	10
Setting the system out of use .....	12
Maintenance .....	13
Periodic Maintenance .....	13
Battery Replacement .....	14
Spare Part Codes .....	15
Technical Characteristics .....	16

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## Warranty

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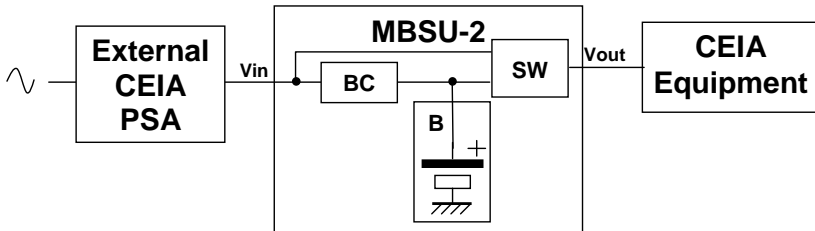
The warranty on all CEIA products, extended to the period agreed with the Sales Department, is applicable to goods supplied from our factory, and for every constituent part thereof, with the exception of the batteries. Any form of tampering with the device, and in particular opening its container, is strictly forbidden and will invalidate the warranty

CEIA reserves the right to make changes, at any moment and without notice, to the models (including programming), their accessories and optionals, to the prices and conditions of sale.

## Operating Principle

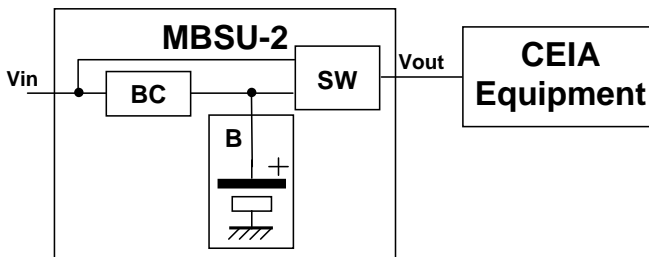
The CEIA MBSU-2 unit is designed to supply 24 to 36 Vdc voltage to CEIA equipment.

The unit can be used as **Uninterruptable Power Supply Unit (UPS)** in applications where a continuous service is required.

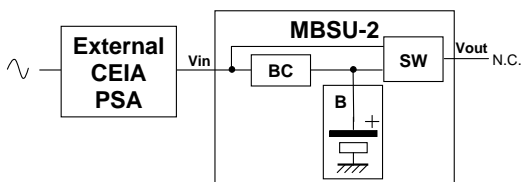


**B** Battery  
**BC** Battery Charger  
**SW** Switch

The unit can also be used **stand-alone**, in installations where mains is not available,



In this application the battery charging process can be carried out with no output load, simply connecting the unit to the mains.



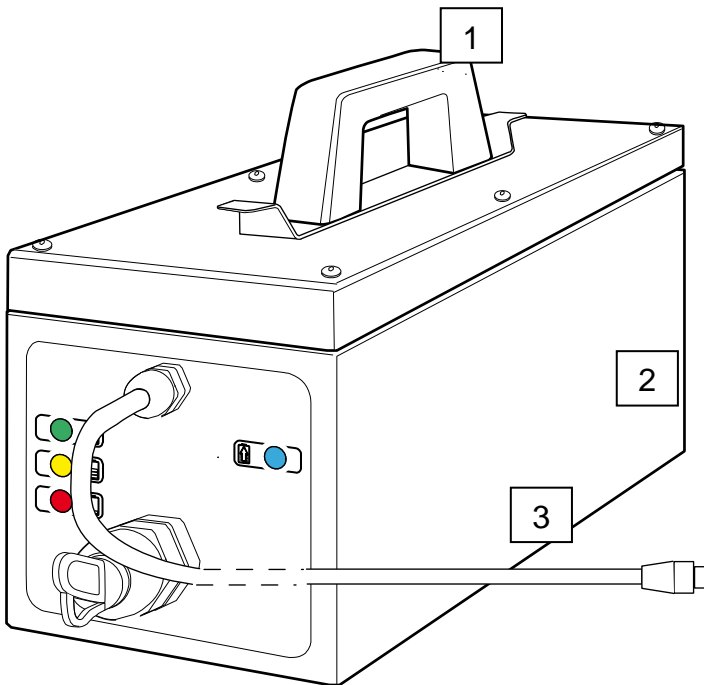
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## Description

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The unit is housed in a robust metal casing (1), fitted with a handle (2) and an output cable (3) to be connected to the CEIA equipment to be supplied.

The handle base is shaped to allow winding the output cable when the unit is not in use.

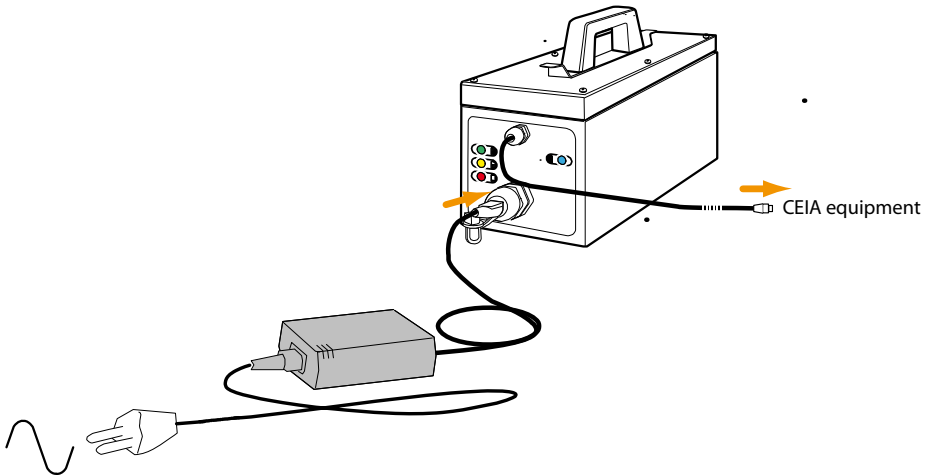


On request, the unit can be provided with a Power Supply Adapter, identical to that of the supplied CEIA equipment, completed of a power cord. This allows the MBSU-2 battery to be charged separately, in order to be ready for use.

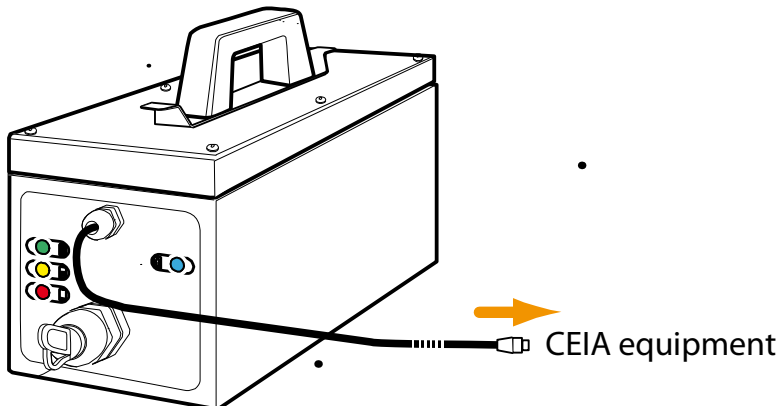
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## Connections

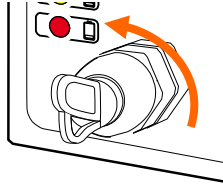
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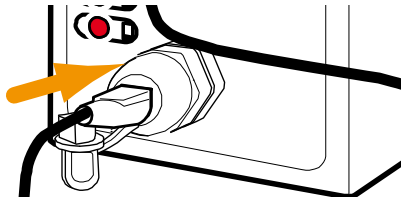
- Switch off the CEIA equipment to be supplied.
- Connect the output cable of the MBSU-2 unit to the power supply input of the CEIA equipment to be supplied.



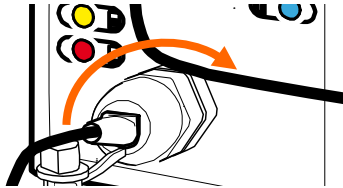
- Connect the output cable of the CEIA External Power Supply Adapter to the “Vin” connector of the MBSU-2 unit:
  - Loose the ring of the strain relief enough to extract its cap.



- Insert the cable plug into the strain relief ensuring that it is properly connected.

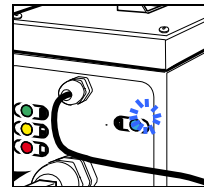
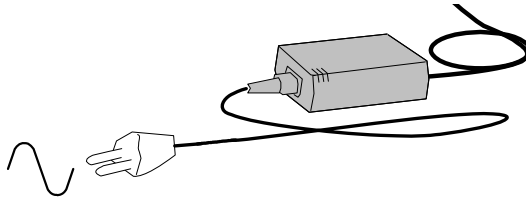


- Secure the cable connector by tightening the ring of the strain relief.



- Connect the input cable of the Power Supply Adapter to the mains and verify that the BLUE lamp on the front panel is ON (either steady or blinking).

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NOTE: do not connect the MBSU-2 output cable to the “Vin” connector.



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# Instructions for Use

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## ***CEIA equipment Operation***

Switch the supplied CEIA equipment on and off using its main switch.

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## ***Battery Charging***

The battery charger is always active when the MBSU-2 unit is connected to the mains through the CEIA External Power Supply Adapter.

The charging process stops automatically when the battery reaches a full charge.

NOTE: the battery charging process can be carried out with or without output load. In this case, make sure not to short circuit the output connections.

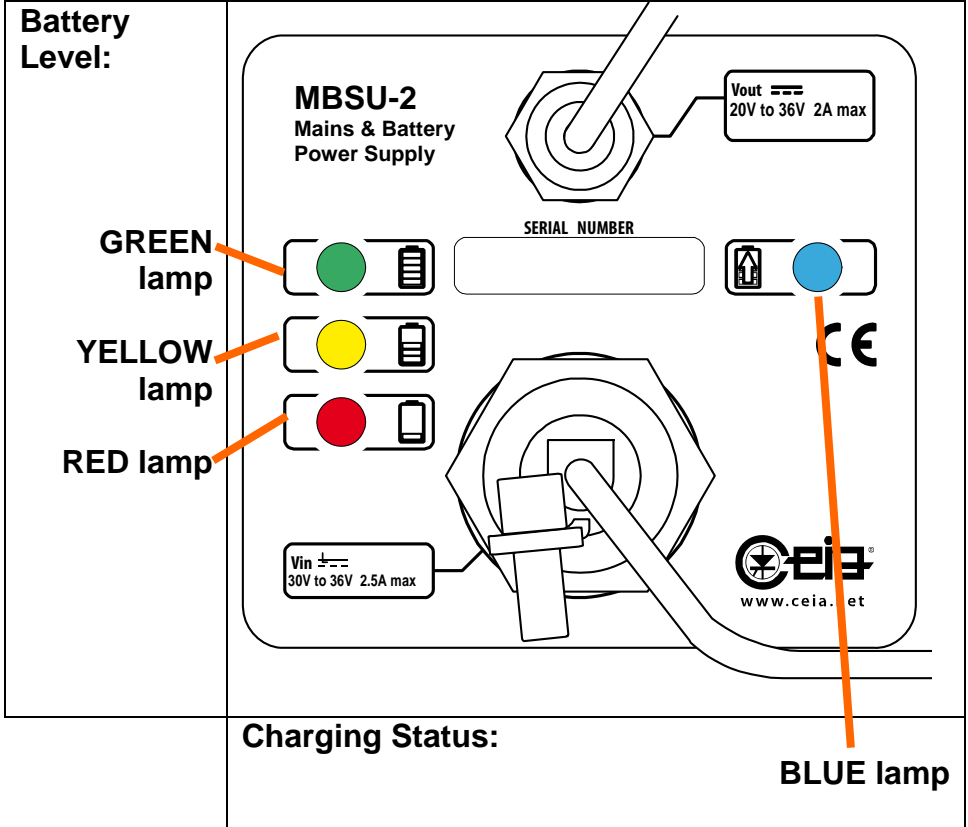
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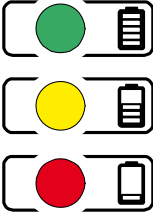
## ***AC Line Loss / Battery Charge indication***

On loss of AC power, the output is automatically switched to the battery with no interruptions.

The operation time in this condition depends on the supplied CEIA equipment .

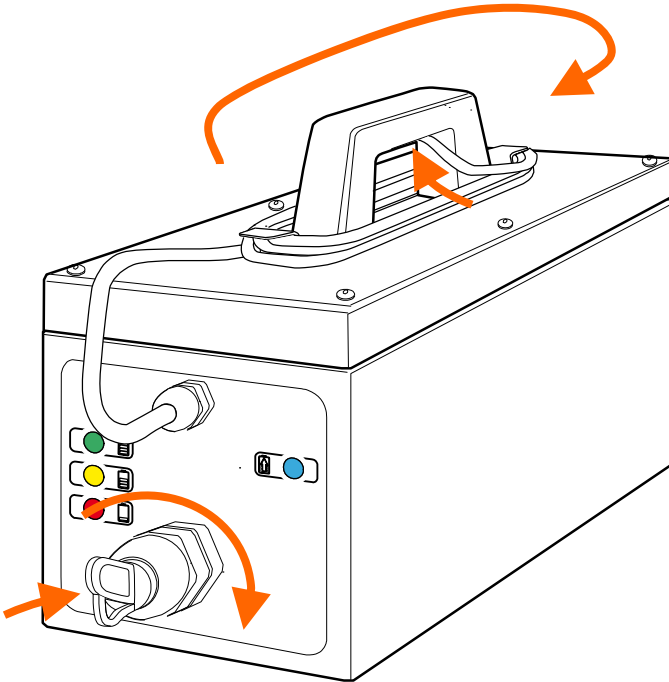
## Indications during use



Indicator	Meaning
 <p><b>BLUE lamp</b></p>	<ul style="list-style-type: none"> <li>• OFF: AC power absent</li> <li>• Blinking: AC power present and battery recharging in progress</li> <li>• Steadily ON: recharging completed, battery charge at full capacity</li> </ul>
 <p><b>GREEN lamp</b></p> <p><b>YELLOW lamp</b></p> <p><b>RED lamp</b></p>	<p>AC power present (CEIA equipment powered by the mains and operating battery charger):</p> <ul style="list-style-type: none"> <li>• Steadily ON: battery charge level during the recharging process: <ul style="list-style-type: none"> <li>○ RED: approximately 20% of the full capacity</li> <li>○ YELLOW: approximately 50% of the full capacity</li> <li>○ GREEN: over 80% of the full capacity</li> </ul> </li> <li>• All lamps OFF: battery empty, the output voltage is disconnected. Carry out a complete cycle of recharge as soon as possible.</li> </ul>
<p><b>GREEN lamp</b></p> <p><b>YELLOW lamp</b></p> <p><b>RED lamp</b></p>	<p>AC power absent (CEIA equipment powered by the battery):</p> <ul style="list-style-type: none"> <li>• Blinking: battery charge level during discharging: <ul style="list-style-type: none"> <li>○ GREEN: over 50% of the full capacity</li> <li>○ YELLOW: between 50% and 20% of the full capacity</li> <li>○ RED: below 20% of the full capacity</li> </ul> </li> <li>• All lamps OFF: battery empty, the output voltage is disconnected. Connect the unit to the power for a complete cycle of recharge as soon as possible.</li> </ul>

## Setting the system out of use

- Switch off the CEIA equipment.
- Disconnect the Power Supply Adapter from the AC line.
- Disconnect the Power Supply Adapter from the MBSU-2 unit and insert the cap into the strain relief.
- Disconnect the MBSU-2 unit from the CEIA equipment.
- Wind the MBSU-2 output cable around the base of the handle and lock it by inserting the plug into the receptacle present in the handle.



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# Maintenance

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## Periodic Maintenance

### ATTENTION!

The device must be disconnected from all power sources before undergoing any maintenance or cleaning, and before being moved.

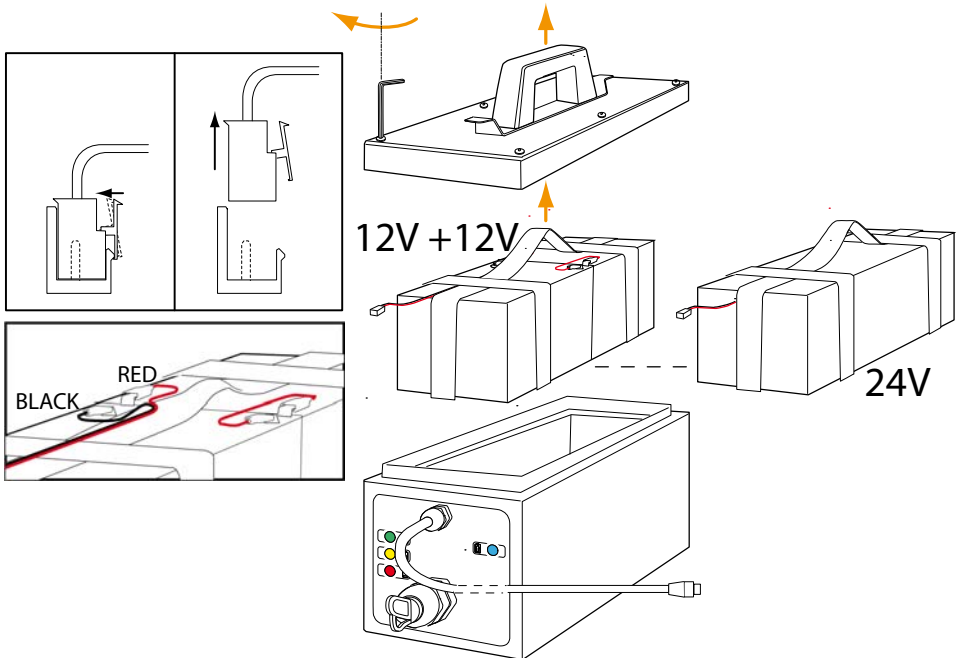
Operation	Recommended period
<p><b>Periodic cleaning</b> Use a slightly moist (with water), non-abrasive cloth.</p> <p><b>ATTENTION!</b> The internal compartment is <b>not waterproof!</b> Do not use liquids when the cover is removed!</p>	<p>6 months  or when necessary</p>
<p><b>Complete cycle of recharge</b> As batteries discharge over time, a complete recharge is strongly recommended every two months.</p> <p>When batteries are flat, which is indicated by the condition of all LEDs switched off, the MBSU-2 must be connected to the power for a complete cycle of recharge.</p>	<p>2 months</p>
<p><b>Battery replacement</b></p>	<p>After approximately 500 charge / discharge cycles.</p>

## Battery Replacement

This operation can be performed by technical qualified personnel only.

Tools required: 3mm Allen key

- Disconnect all cables.
- Remove the battery compartment cover, by loosening the screws by means of the Allen key.
- Disconnect the battery, loosening the retention clip of the plug. NOTE: the unit can be equipped with either two 12Vdc batteries or one 24Vdc battery.
- Extract the battery, pulling the belt.
- Detach the battery handling system
- Attach the battery handling system to the new one.
- Insert the battery into the case.
- Connect the battery.
- Remount the battery compartment cover.



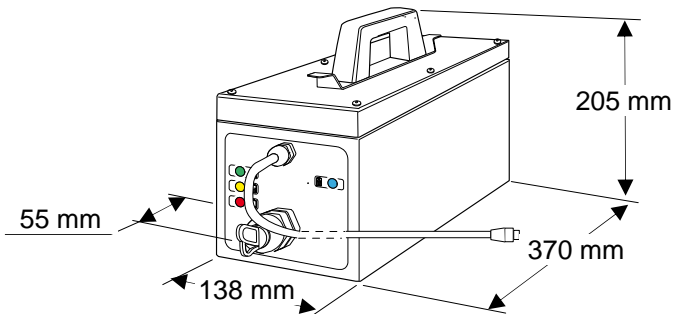
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## Spare Part Codes

Item	Code
MBSU-2 unit	MBSU-2
24V 14Ah one-piece battery	50833
12V 12Ah ... 15Ah Battery Pack (2 pieces)	52195
Connecting cable for 12V Battery Pack	52213
IP30 Power Supply Adapter (option)	44041
Power supply cord with CEE7 plug (option)	1559
Power supply cord with NEMA P15 plug (option)	1574
Power supply cord with BS 1363 plug (option)	1570
IP67 Power Supply Adapter (option)	48092

## Technical Characteristics

- Power supply: 30Vdc - 2.5A to 36Vdc – 2.1A.
- Output: 20Vdc to 36Vdc - 2A max.
- Battery pack: 1 x 24Vdc-14Ah or 2 x 12Vdc 12...15Ah ;
- Battery charger with auto shut-off.
- Charging time: 5 hours typical.
- Battery service life:  $\geq 500$  charge/discharge cycles.
- Dimensions: 425 x 138 x 205 mm (16.7 x 5.4 x 8.1 in);
- Weight: about 12.7 kg (28 lbs).
- Degree of protection (IEC 60529): IP65.
- Output cable length: 1.75m.
- Indicators:
  - battery level
  - charging status
- Environmental conditions:
  - Working temperature:  $-10 \dots +65^{\circ}\text{C}$  (14 ...149°F)  
Storage temperature:  $-37 \dots +70^{\circ}\text{C}$  (-35...158°F).
  - Relative humidity: 0 ... 95%, non-condensing.



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