

# EN

ORIGINAL INSTRUCTIONS  
BATTERY CHARGER



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**Notes regarding the operating manual**


**Symbols**

 **Warning of electrical voltage**  
 This symbol indicates dangers to the life and health of persons due to electrical voltage.


 **Warning of explosive substances**  
 This symbol indicates dangers to the life and health of persons due to potentially explosive substances.


 **Warning of caustic substances**  
 This symbol indicates dangers to the life and health of persons due to corrosive substances.


 **Warning**  
 This signal word indicates a hazard with an average risk level which, if not avoided, can result in serious injury or death.


 **Caution**  
 This signal word indicates a hazard with a low risk level which, if not avoided, can result in minor or moderate injury.

**Note**  
 This signal word indicates important information (e.g. material damage), but does not indicate hazards.

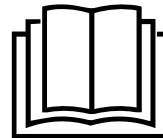
 **Info**  
 Information marked with this symbol helps you to carry out your tasks quickly and safely.

 **Follow the manual**  
 Information marked with this symbol indicates that the operating manual must be observed.

 **Wear safety glasses**  
 Information marked with this symbol indicates that you should wear eye protection.

 **Wear protective gloves**  
 Information marked with this symbol indicates that you should wear protective gloves.

You can download the current version of the instructions and the EU declaration of conformity via the following link:




PBCS 2A



<https://hub.trotec.com/?id=46743>

**Safety**

 **Warning**  
**Read all safety warnings and all instructions.**  
 Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.  
**Save all warnings and instructions for future reference.**  
 This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.  
 Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

- Check the device for potential damage before each application. Do not use any defective devices or device parts.
- Never use the device for non-rechargeable batteries.
- Only touch the insulated area of the battery terminals.
- Do not use the device in potentially explosive rooms or areas and do not install it there.
- Do not use the device in aggressive atmosphere.
- Do not immerse the device in water. Do not allow liquids to penetrate into the device.
- Do not use the device with wet or damp hands.

- Do not under any circumstances use the device if you detect damages on the mains plug or power cable. If the power cable is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.  
Defective power cables pose a serious health risk!
- This appliance is not a toy. Keep away from children and animals.
- Do not open the device.
- When operating the device, observe the polarity. In the case of reverse polarity, the reverse polarity protection function stops the charging process from being started, in order to prevent damage to the charger and battery.
- Interrupt the charging process if the battery gets too hot. For the maximum temperature, please refer to the manufacturer specifications in the vehicle's operating manual.

### Safety warnings on the device

The following safety instructions are additionally attached to the device:

- Read all safety warnings and all instructions.
- Using the device may produce explosive oxyhydrogen gas. Only operate the device in rooms that are well ventilated and prevent open fire and spark formation.
- Always remove the mains plug from the mains socket before attaching or removing the battery terminals.
- Do not expose the charger to rain or wet conditions.

### Note regarding automatic charging

The device is provided with a microprocessor control, allowing for automatic monitoring and adaptation of the multi-stage charging cycle. This makes monitoring of the charging process indispensable. Nevertheless we advise you not to leave the battery unattended over a longer period, so that you will be able to disconnect the device manually from the power supply in the event of a fault.

### Intended use

This device is designed for charging batteries used in vehicles. This refers to both non-maintenance-free and maintenance-free 12 V batteries, including wet batteries like for instance lead acid, Ca/Ca and EFB batteries as well as lead gel and AGM batteries.

The device is suitable for indoor use as well as for outdoor areas protected from weather conditions.

The device is only intended for private, non-commercial use.

### Foreseeable misuse

The device must not be used for charging lithium iron phosphate batteries (e.g. LiFePO<sub>4</sub>) or other rechargeable lithium batteries.

The device must not be used to charge non-rechargeable batteries.

The device is only intended for mobile use and not for the installation in caravans, camper vans or similar vehicles.

The device is not intended as buffer power supply, e.g. during a battery change.

### Personnel qualifications

People who use this device must:

- have sufficient proficiency in the field of electrics and utilise the device performing safe working practices.
- have read and understood the operating manual, especially the Safety chapter.

### Personal protective equipment



#### Wear safety glasses

Wear suitable protective goggles when using the device.



#### Wear protective gloves

Wear suitable protective gloves when using the device.

**Residual risks**



**Warning**  
**Explosion hazard!**

Using the device may produce explosive gas. Prevent spark formation that is caused for instance by smoking and open fire. Ensure sufficient ventilation.



**Warning of caustic substances**

The acid contained in the battery is corrosive. Rinse out acid splashes thoroughly immediately with plenty of water and consult a doctor in case of an emergency.



**Warning of electrical voltage**  
**Electric shock due to lightning strike.**

Do not work outdoors in case of approaching thunderstorms.

In case of a thunderstorm, disconnect the device from the mains.

The operator is responsible for the lightning protection of the building.



**Warning of electrical voltage**

Electric shock due to insufficient insulation!

Check the device for damages and proper functioning before each use.

If you detect damages, do not use the device any longer.

Do not use the device when either the device or your hands are damp or wet!



**Warning of electrical voltage**

Before any work on the device, remove the mains plug from the mains socket!

Do not touch the mains plug with wet or damp hands.

Hold onto the mains plug while pulling the power cable out of the mains socket.



**Warning of electrical voltage**

Work on the electrical components must only be carried out by an authorised specialist company!



**Caution**

Keep a sufficient distance from heat sources.

**Note**

To prevent damages to the device, do not expose it to extreme temperatures, extreme humidity or moisture.

**Note**

Do not use abrasive cleaners or solvents to clean the device.

**Information about the device**

**Device description**

The device serves to charge various battery types of vehicles.

The device charges the battery by transporting mains current into the battery via a charging cable. A second charging cable is attached for the purpose of earthing on one of the points specified in the vehicle's instructions.

The microprocessor control ensures that the multi-stage charging process is monitored and adapted automatically.

In the *winter charging mode*, the battery can be charged at an outdoor temperature of -20 °C to +5 °C.

In the *trickle charging mode*, the battery can be protected against deep discharge and maintained at a permanently ideal charging level, e.g. for seasonally used vehicles with long downtimes.

The device features IP65 type of protection and is dust-tight and protected against water jets.

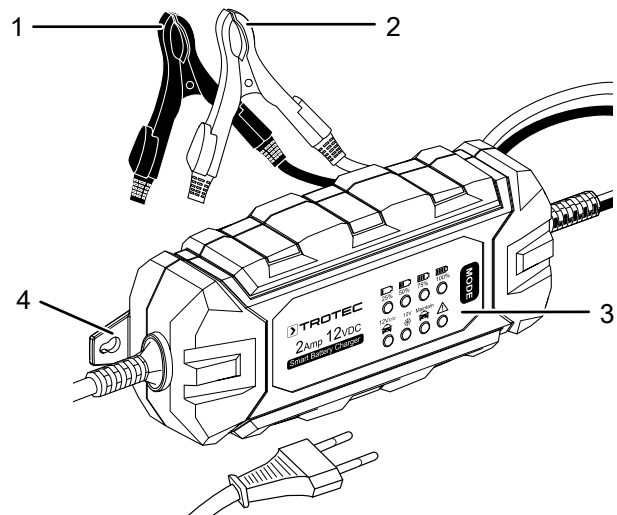
The device is provided with protective mechanisms protecting the charger and battery, including reverse polarity protection and protection against short circuits.

Fully insulated battery terminals and a suspension eye for wall mounting provide for safe and convenient use.

**Scope of delivery**



- 1 x Battery charger
- 1 x Manual

**Device depiction**



No.	Designation
1	Black battery terminal ( - )
2	Red battery terminal ( + )
3	Control panel
4	Suspension eye

## Technical data










Parameter	Value
Model	PBCS 2A
Mains voltage	220 – 240 V / ~ 50 Hz
Rated input power	Max. 35 W
Nominal output voltage	12 V DC
Rated output current	Max. 2 A
Charging end voltage	14.2 - 14.8 V
Fusing 	3.15 A (slow-blowing)
Protection class	II / 
Type of protection	IP65
Ambient temperature	-20 °C to +40 °C
Battery capacity standard charging mode, winter charging mode	4 - 60 Ah
Battery capacity trickle charging mode (max. 1 A)	3 - 32 Ah
Length of the supply line	150 cm
Length of charging cable	155 cm
Plug type	CEE 7/16
Dimensions (length x width x height)	200 mm x 85 mm x 48 mm
Weight	0.37 kg
Charging time (up to 80 %)	
4 Ah	2 h
10 Ah	5 h
30 Ah	15 h
60 Ah	30 h

## Field of application

The models that will be required from our range of chargers in each case depend on the type of vehicle.

This operating manual applies to the PBCS 2A model.

The following table provides you with an overview of the models suitable for the respective vehicle types.

Approximate charging time	PBCS 2A	PBCS 4A	PBCS 6A	PBCS 10A	Common battery size
	++ 2 h	+	+	-	4 Ah
	++ 6 h	++ 3 h	+	-	12 Ah
	++ 9 h	++ 5 h	++ 3 h	-	18 Ah
	+	++ 11 h	++ 8 h	+	45 Ah
	--	++ 18 h	++ 12 h	++ 7 h	70 Ah
	--	+	++ 17 h	++ 10 h	100 Ah
	--	-	+	++ 12 h	120 Ah
	--	--	+	++ 15 h	145 Ah
	--	--	--	++ 18 h	180 Ah

Icon	Meaning
++	The device is <b>well suited</b> for this vehicle type.
+	The device is <b>suited</b> for this vehicle type.
-	The device is <b>less suited</b> for this vehicle type.
--	The device is <b>not suited</b> for this vehicle type.

**Transport and storage**

**Note**

If you store or transport the device improperly, the device may be damaged.  
 Note the information regarding transport and storage of the device.

**Transport**

Before transporting the device, observe the following:

- Hold onto the mains plug while pulling the power cable out of the mains socket.
- Do not use the power cable to drag the device.

**Storage**

- Store the device in a dry location and protected from frost and heat.
- Store the device in a location where it is protected from dust and direct sunlight.

**Operation**

**Preparing the charging process**



**Warning of electrical voltage**

Electric shock due to insufficient insulation!  
 Check the device for damages and proper functioning before each use.  
 If you detect damages, do not use the device any longer.  
 Do not use the device when either the device or your hands are damp or wet!



**Warning**

**Explosion hazard!** Never charge frozen batteries or batteries with a temperature of more than 45 °C.



**Warning of caustic substances**

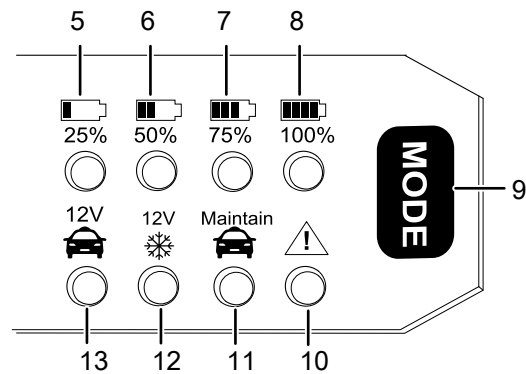
The acid contained in the battery is corrosive. Rinse out acid splashes thoroughly and immediately with plenty of water and consult a doctor in case of an emergency.  
 Wear protective goggles and suitable protective gloves.



**Unpacking the device**

1. Take the device out of the packaging.
2. Check the content for damage.
3. Dispose of the packaging material according to the national regulations.

**Control panel**



No.	Designation	Meaning
5	LED charging level 25 %	Battery charged 25 %
6	LED charging level 50 %	Battery charged 50 %
7	LED charging level 75 %	Battery charged 75 %
8	LED charging level 100 %	Battery charged 100 %
9	Mode button	Setting the desired charging mode
10	Error LED	Terminals connected incorrectly (reverse polarity), wrong battery voltage (< 3.5 V or > 15 V) or short circuit
11	Trickle charging mode LED	Is illuminated when the trickle charging mode is activated
12	Winter charging mode LED	Is illuminated when the winter charging mode is activated
13	Standard charging mode LED	Is illuminated when the standard charging mode is activated

## Setting the charging mode

The standard charging mode, winter charging mode and trickle charging mode can be activated by pressing the Mode button (9). Depending on the charging mode selected, the corresponding LED lights up on the control panel (11 - 13).

### Standard charging mode

The standard charging mode is suitable for all 12 V batteries of the lead acid, AGM and GEL type.

### Trickle charging mode

In the trickle charging mode there is a maximum charging current of 1 A. The trickle charging mode meets the following functions:

- Charging of 12 V batteries of the lead acid, AGM and GEL type with a low charging capacity.
- Trickle charge of a 12 V battery of the lead acid, AGM and GEL type as protection against deep discharge. The battery is continuously maintained at a capacity of 95 - 100 % by means of pulse charging.

### Winter charging mode

In the winter charging mode, 12 V batteries of the lead acid, AGM and GEL type can be charged at an ambient temperature of -20 °C to +5 °C.

### Charging process



#### Warning

Never use these devices to charge non-rechargeable batteries. Only charge battery types that are indicated in the chapter "Intended use".

As a rule, the battery should be charged when removed.

If it is not possible to remove the battery, it can remain inside the vehicle during the charging process. Note that most vehicles have a negative grounding. The negative terminal of the battery is connected to the car body.

In rare cases, however, there may be a positive grounding where the positive terminal of the battery is connected to the car body.

For this reason, observe the information on earthing in the vehicle instructions before using the charger.

### Charging process when removed

1. Remove the battery prior to the charging process, taking the manufacturer instructions and the vehicle instructions into consideration.
2. Clamp the red cable (2) to the positive terminal of the battery.
3. Clamp the black cable (1) to the negative terminal of the battery.

4. Plug the mains plug of the charger into the mains socket.
  - ⇒ All LEDs will light up briefly. Afterwards, the LED indicating the charging mode (11 - 13) as well as the LEDs indicating the charging level (5 - 8) will be illuminated constantly.
5. Select the desired charging mode as described in the *Setting the charging mode* section.
  - ⇒ Afterwards, the LEDs indicating the charging level 5 - 8 will flash in succession. When the charging process has been completed and the battery is fully charged, the LEDs (5 - 8) will be illuminated constantly. If the LED indicating the charging mode (13) is the only one flashing, the device is not connected properly to the battery, but only to the mains socket.
6. To stop the charging process, hold onto the mains plug while pulling the power cable out of the mains socket.
7. Remove the black clamp (1) from the negative terminal of the battery.
8. Remove the red clamp (2) from the positive terminal of the battery.

#### Note

If the mains plug has already been disconnected from the mains socket and the battery clamps are still attached, the charger might slightly discharge the battery. We therefore recommend always removing the charger completely from the battery after the charging process.

9. Check the terminal posts of the battery for dirt and corrosion and, if necessary, clean them as described in the manufacturer specifications.
10. Reinstall the charged battery in accordance with the vehicle instructions.

### Charging with negative grounding

1. Switch off all electrical loads.

#### Note

Take into account that any active loads will yet delay the charging process when the battery remains installed during the process.

2. Clamp the red cable (2) to the positive terminal of the battery.
3. Clamp the black cable (1) to the car body, observing the vehicle instructions and keeping a distance from the battery and fuel line.
4. Plug the mains plug of the charger into the mains socket.
  - ⇒ All LEDs will light up briefly. Afterwards, the LED indicating the charging mode (11 - 13) as well as the LEDs indicating the charging level (5 - 8) will be illuminated constantly.

5. Select the desired charging mode as described in the *Setting the charging mode* section.  
⇒ Afterwards, the LEDs indicating the charging level 5 - 8) will flash in succession.  
When the charging process has been completed and the battery is fully charged, the LEDs (5 - 8) will be illuminated constantly.  
If the LED indicating the charging mode (13) is the only one flashing, the device is not connected properly to the battery, but only to the mains socket.
6. To stop the charging process, hold onto the mains plug while pulling the power cable out of the mains socket.
7. Remove the black clamp (1) from the car body.
8. Remove the red clamp (2) from the positive terminal of the battery.

**Note**

If the mains plug has already been disconnected from the mains socket and the battery clamps are still attached, the charger might slightly discharge the battery. We therefore recommend always removing the charger completely from the battery after the charging process.

9. Check the terminal posts of the battery for dirt and corrosion and, if necessary, clean them as described in the manufacturer specifications.

**Charging with positive grounding**

1. Switch off all electrical loads.

**Note**

Take into account that any active loads will yet delay the charging process when the battery remains installed during the process.

2. Clamp the black cable (1) to the negative terminal of the battery.
3. Clamp the red cable (2) to the car body, observing the vehicle instructions and keeping a distance from the battery and fuel line.
4. Plug the mains plug of the charger into the mains socket.  
⇒ All LEDs will light up briefly. Afterwards, the LED indicating the charging mode (11 - 13) as well as the LEDs indicating the charging level (5 - 8) will be illuminated constantly.

5. Select the desired charging mode as described in the *Setting the charging mode* section.  
⇒ Afterwards, the LEDs indicating the charging level 5 - 8) will flash in succession.  
When the charging process has been completed and the battery is fully charged, the LEDs (5 - 8) will be illuminated constantly.  
If the LED indicating the charging mode (13) is the only one flashing, the device is not connected properly to the battery, but only to the mains socket.
6. To stop the charging process, hold onto the mains plug while pulling the power cable out of the mains socket.
7. Remove the red clamp (2) from the car body.
8. Remove the black clamp (1) from the negative terminal of the battery.

**Note**

If the mains plug has already been disconnected from the mains socket and the battery clamps are still attached, the charger might slightly discharge the battery. We therefore recommend always removing the charger completely from the battery after the charging process.

9. Check the terminal posts of the battery for dirt and corrosion and, if necessary, clean them as described in the manufacturer specifications.

**Calculating the charging time**

Normally the duration of the charging process depends on the previous charging level of the battery. The charging time required to charge an empty battery to up to approx. 80 % can be calculated as follows:

Charging time (h) = battery capacity in Ah ÷ charging current in Amp.

For more information on this, please also refer to the table in the *Field of application* section.

**Note**

If the battery is fully charged after just a few minutes, the battery capacity presumably is very low. In this case, the battery should be replaced.



## Errors and faults

The device has been checked for proper functioning several times during production. If malfunctions occur nonetheless, check the device according to the following list.

### The device is not charging:

- Make sure that the power plug is inserted and the power supply is working.

### The device is switched on and the Error display (10) is illuminated:

- Check whether the charging clips are connected correctly. Otherwise, the reverse polarity protection function prevents the charging process from being started, ensuring that the charger and battery are not damaged.
- Make sure that the charging clips are not in contact with each other. In the event of a short circuit, the short circuit protection function ensures that the charger will not be damaged.
- Make sure that the battery is suited for charging, since the battery type is not recognised automatically. A voltage of less than 3.5 V or more than 15 V can cause a fault indication.
- Check whether the battery to be charged is defective and refer to suitable specialised personnel, if necessary.

## Maintenance

### Cleaning

Clean the device with a soft, damp and lint-free cloth. Ensure that no moisture enters the housing. Protect electrical components from moisture. Do not use any aggressive cleaning agents such as cleaning sprays, solvents, alcohol-based or abrasive cleaners to dampen the cloth.

Wipe the housing dry after cleaning.

Clear the device terminals from dirt and corrosion.

### Repair

Do not modify the device or install any spare parts. For repairs or device testing, contact the manufacturer.

## Disposal

Always dispose of packing materials in an environmentally friendly manner and in accordance with the applicable local disposal regulations.



The icon with the crossed-out waste bin on waste electrical or electronic equipment is taken from Directive 2012/19/EU. It states that this device must not be disposed of with the household waste at the end of its life. You will find collection points for free return of waste electrical and electronic equipment in your vicinity. The addresses can be obtained from your municipality or local administration. You can also find out about other return options that apply for many EU countries on the website <https://hub.trotec.com/?id=45090>. Otherwise, please contact an official recycling centre for electronic and electrical equipment authorised for your country.

The separate collection of waste electrical and electronic equipment aims to enable the re-use, recycling and other forms of recovery of waste equipment as well as to prevent negative effects for the environment and human health caused by the disposal of hazardous substances potentially contained in the equipment.

### Only for United Kingdom

According to Waste Electrical and Electronic Equipment Regulations 2013 (SI 2013/3113) (as amended) devices that are no longer usable must be collected separately and disposed of in an environmentally friendly manner.

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