

CHARGER CHAMP PRO 12 V / 24 V

LEAB
by Micropower Group



USER MANUAL
VERSION 13
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1 About this user manual

Read this user manual carefully and keep it in a safe place. This user manual is intended for Skilled workers in the field of automotive electrics.

Any modifications to the product or its components are prohibited and do not conform to its intended use. Only use accessories approved by Micropower GmbH.

Within this user manual, you will be notified of potential hazards involved in handling the device through warnings and safety instructions. The colours and signal words indicate the severity of the hazard:



Notice

Possibility of material damage

The signal word *Notice* indicates that there is a possibility of material damage. To avoid material damage, follow the instruction.



CAUTION

Danger that can lead to minor injuries

Safety instructions with the signal word *CAUTION* indicate a hazard which, if not avoided, can result in minor or moderate injury. Read the safety instructions carefully and follow them to avoid the hazard.



WARNING

Hazards that can lead to severe injuries or death

Safety instructions with the signal word *WARNING* indicate a hazard which, if not avoided, can result in death or severe injury. Read the safety instructions carefully and follow them to avoid the hazard.

**⚠ DANGER****Danger that will lead to severe injury or death**

Safety instructions with the signal word *Danger* indicate a hazard which, if not avoided, will result in death or severe injury. Read the safety instructions carefully and follow them to avoid the hazard.

You will find useful tips and tricks in some parts of the user manual. These appear as follows:

**TIP****Tips provides additional, useful information.**

Read the tip carefully and follow the instructions where applicable.

2 Safety

This manual will help you to handle the device safely. Use the device solely in accordance with its intended use. Observe the safety instructions.

Any modifications to the device or its components are prohibited and do not conform to its intended use. Keep this manual in a place where it can be accessed quickly.

2.1 Intended Use

The charger is designed for charging and trickle charging of auxiliary batteries within the vehicle's on-board supply system. The device variants are each tailored for the specific Lead-acid batteries (wet, gel, AGM) to be charged, including their voltage and capacity.

Use the device only within an ambient temperature range of -30°C to 60°C. Higher temperatures will result in reduced output power.



⚠ WARNING

Risk of fire from overheated battery

Flammable gases can escape if the battery overheats.

1. Always charge batteries in well-ventilated rooms and away from ignition sources.



⚠ WARNING

Risk of injury from damaged, frozen or deformed batteries

Damaged, frozen or deformed batteries can cause injuries.

1. Before using the battery, make sure that the battery is undamaged and the electrolyte is not frozen.



⚠ WARNING

Burns from escaping acid

Acid can leak out when handling batteries.

1. Wear acid-proof clothing when handling batteries.
-

**Notice****Device defects from incorrect installation**

Incorrect installation can result in device defects.

1. Install the device in a dry and cool location.

2.2 Foreseeable Misuse

Charge only Lead-acid batteries (wet, gel, AGM) that are compatible with the device variant using this charger.

To avoid damage, never pinch the cables of the charger. In the event of damage, unplug the charger immediately and contact your dealer or Micropower GmbH.

3 About this Product

The Champ Pro charger is designed for use in vehicles with a 12 or 24 volt electrical system and is used to charge auxiliary batteries and provide a continuous trickle charge. The housing is waterproof (IP67).

The different models vary in terms of their specified charging voltages and power limits. With the Champ Pro charger, the appropriate charging curve can be set for all types of Lead-acid batteries (wet, gel, AGM) to ensure the battery is charged optimally.



Fig. 1: Champ Pro charger

1	Display	2	AC cable
3	DC cable		

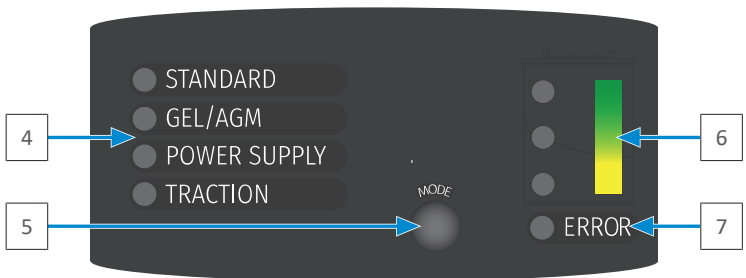


Fig. 2: Champ Pro charger display

4	Charging characteristic indicator	5	Mode button
6	Charge status indicator	7	Error indicator

4 Technical specifications

	Part no. 0101043880	Part no. 0101056008
Model	Champ Pro 1217	Champ Pro 1217
Battery type	Lead acid (wet, gel/AGM)/traction	Lead acid (wet, gel/AGM)/traction
Charging characteristics	Choice of 4 charging characteristics	Choice of 4 charging characteristics
Battery capacity	55 Ah ... 170 Ah	55 Ah ... 170 Ah
Temperature sensor	Yes	Yes
AC wire	2.0 m, two-pin earthed plug	0.2 m; DEFA
DC wire	1,5 m, ring terminal, M8	1,5 m, ring terminal, M8
Charging current	17 A	17 A
Ripple	< 3 %	< 3 %
Main charging	14.2 V/14.4 V	14.2 V/14.4 V
Equalisation charging	16.0 V	16.0 V
Trickle charging	13.6 V/13.8 V	13.6 V/13.8 V
Power supply unit function	13.7 V	13.7 V
Input voltage	230 V	230 V
Input values	195 V ... 250 V	195 V ... 250 V
Input frequency	40 Hz ... 60 Hz	40 Hz ... 60 Hz
Quiescent current (from the battery)	< 1 mA	< 1 mA
Mains fuse	B16 A or C16 A	B16 A or C16 A
Degree of efficiency, max.	> 88%	> 88%
IP rating	IP67	IP67
Protection class	I	I
Operating temperature	-30 °C ... +60°C	-30 °C ... +60°C
Dimensions (L x W x H)	195 mm x 98 mm x 47 mm	195 mm x 98 mm x 47 mm
Weight	1.5 kg	1.5 kg

	Part no. 0101043890	Part no. 0101043915
Model	Champ Pro 1230	Champ Pro 1230
Battery type	Lead acid (wet, gel/AGM)/traction	Lead acid (wet, gel/AGM)/traction
Charging characteristics	Choice of 4 charging characteristics	Choice of 4 charging characteristics
Battery capacity	90 Ah ... 300 Ah	90 Ah ... 300 Ah
Temperature sensor	Yes	No
AC wire	2.0 m, two-pin earthed plug	2.0 m, two-pin earthed plug
DC wire	1,5 m, ring terminal, M8	5 m, ring terminal, M8
Charging current	30 A	30 A
Ripple	< 3 %	< 3 %
Main charging	14.2 V/14.4 V	14.2 V/14.4 V
Equalisation charging	16.0 V	16.0 V
Trickle charging	13.6 V/13.8 V	13.6 V/13.8 V
Power supply unit function	13.7 V	13.7 V
Input voltage	230 V	230 V
Input values	195 V ... 250 V	195 V ... 250 V
Input frequency	40 Hz ... 60 Hz	40 Hz ... 60 Hz
Quiescent current (from the battery)	< 1 mA	< 1 mA
Mains fuse	B16 A or C16 A	B16 A or C16 A
Degree of efficiency, max.	> 88%	> 88%
IP rating	IP67	IP67
Protection class	I	I
Operating temperature	-30 °C ... +60°C	-30 °C ... +60°C
Dimensions (L x W x H)	195 mm x 98 mm x 47 mm	195 mm x 98 mm x 47 mm
Weight	1.5 kg	1.5 kg

	Part no. 0101056012
Model	Champ Pro 1230
Battery type	Lead acid (wet, gel/AGM)/traction
Charging characteristics	Choice of 4 charging characteristics
Battery capacity	90 Ah ... 300 Ah
Temperature sensor	Yes
AC wire	2.0 m, Neutrik
DC wire	5 m, ring terminal, M8
Charging current	30 A
Ripple	< 3 %
Main charging	14.2 V/14.4 V
Equalisation charging	16.0 V
Trickle charging	13.6 V/13.8 V
Power supply unit function	13.7 V
Input voltage	230 V
Input values	195 V ... 250 V
Input frequency	40 Hz ... 60 Hz
Quiescent current (from the battery)	< 1 mA
Mains fuse	B16 A or C16 A
Degree of efficiency, max.	> 88%
IP rating	IP67
Protection class	I
Operating temperature	-30 °C ... +60°C
Dimensions (L x W x H)	195 mm x 98 mm x 47 mm
Weight	1.5 kg

	Part no. 0101043982	Part no. 0101043881
Model	Champ Pro 2412	Champ Pro 2412
Battery type	Lead acid (wet, gel/AGM)/ traction	Lead acid (wet, gel/AGM)
Charging characteristics	Choice of 4 charging characteristics	Choice of 4 charging characteristics
Battery capacity	40 Ah ... 120 Ah	65 Ah ... 200 Ah
Temperature sensor	No	Yes
AC wire	2.0 m, two-pin earthed plug	2.0 m, two-pin earthed plug
DC wire	1,5 m, ring terminal, M8	1,5 m, ring terminal, M8
Charging current	12 A	12 A
Ripple	< 3 %	< 3 %
Main charging	28.4 V/28.8 V	28.4 V/28.8 V
Equalisation charging	32.0 V	32.0 V
Trickle charging	27.0 V/27.6 V	27.0 V/27.6 V
Power supply unit function	27.4 V	27.4 V
Input voltage	230 V	230 V
Input values	195 V ... 250 V	195 V ... 250 V
Input frequency	40 Hz ... 60 Hz	40 Hz ... 60 Hz
Quiescent current (from the battery)	< 1 mA	< 1 mA
Mains fuse	B16 A or C16 A	B16 A or C16 A
Degree of efficiency, max.	> 88%	> 88%
IP rating	IP67	IP67
Protection class	I	I
Operating temperature	-30 °C ... +60°C	-30 °C ... +60°C
Dimensions (L x W x H)	195 mm x 98 mm x 47 mm	195 mm x 98 mm x 47 mm
Weight	1.5 kg	1.5 kg

	Part no. 0101043891	Part no. 0101043999
Model	Champ Pro 2420	Champ Pro 2420
Battery type	Lead acid (wet, gel/AGM)/traction	Lead acid (wet, gel/AGM)/traction
Charging characteristics	Choice of 4 charging characteristics	Choice of 4 charging characteristics
Battery capacity	65 Ah ... 200 Ah	65 Ah ... 200 Ah
Temperature sensor	Yes	Yes
AC wire	2.0 m, two-pin earthed plug	1.5 m, two-pin earthed plug
DC wire	1,5 m ring terminal, M8	3 m, ring terminal, M8
Charging current	20 A	20 A
Ripple	< 3 %	< 3 %
Main charging	28.4 V/28.8 V	28.4 V/28.8 V
Equalisation charging	32.0 V	32.0 V
Trickle charging	27.0 V/27.6 V	27.0 V/27.6 V
Power supply unit function	27.4 V	27.4 V
Input voltage	230 V	230 V
Input values	195 V ... 250 V	195 V ... 250 V
Input frequency	40 Hz ... 60 Hz	40 Hz ... 60 Hz
Quiescent current (from the battery)	< 1 mA	< 1 mA
Mains fuse	B16 A or C16 A	B16 A or C16 A
Degree of efficiency, max.	> 88%	> 88%
IP rating	IP67	IP67
Protection class	I	I
Operating temperature	-30 °C ... +60°C	-30 °C ... +60°C
Dimensions (L x W x H)	195 mm x 98 mm x 47 mm	195 mm x 98 mm x 47 mm
Weight	1.5 kg	1.5 kg

	Part no. 0101056901	Part no. 0101056005
Model	Champ Pro 2420	Champ Pro 2420
Battery type	Lead acid (wet, gel/AGM)/ traction	Lead acid (wet, gel/AGM)
Charging characteristics	Choice of 4 charging characteristics	Choice of 4 charging characteristics
Battery capacity	65 Ah ... 200 Ah	65 Ah ... 200 Ah
Temperature sensor	Yes	No
AC wire	1.5 m, two-pin earthed plug	1.5 m, Neutrik
DC wire	0.5 m, MTA connector, 3 pin	5.0 m, without plug
Charging current	20 A	20 A
Ripple	< 3 %	< 3 %
Main charging	28.4 V/28.8 V	28.4 V/28.8 V
Equalisation charging	32.0 V	32.0 V
Trickle charging	27.0 V/27.6 V	27.0 V/27.6 V
Power supply unit function	27.4 V	27.4 V
Input voltage	230 V	230 V
Input values	195 V ... 250 V	195 V ... 250 V
Input frequency	40 Hz ... 60 Hz	40 Hz ... 60 Hz
Quiescent current (from the battery)	< 1 mA	< 1 mA
Mains fuse	B16 A or C16 A	B16 A or C16 A
Degree of efficiency, max.	> 88%	> 88%
IP rating	IP67	IP67
Protection class	I	I
Operating temperature	-30 °C ... +60°C	-30 °C ... +60°C
Dimensions (L x W x H)	195 mm x 98 mm x 47 mm	195 mm x 98 mm x 47 mm
Weight	1.5 kg	1.5 kg

	Part no. 0101043981
Model	Champ Pro 2420
Battery type	Lead acid (wet, gel/AGM)
Charging characteristics	Choice of 4 charging characteristics
Battery capacity	65 Ah ... 200 Ah
Temperature sensor	No
AC wire	2.0 m, two-pin earthed plug
DC wire	3,0 m, ring terminal, M8
Charging current	20 A
Ripple	< 3 %
Main charging	28.4 V/28.8 V
Equalisation charging	32.0 V
Trickle charging	27.0 V/27.6 V
Power supply unit function	27.4 V
Input voltage	230 V
Input values	195 V ... 250 V
Input frequency	40 Hz ... 60 Hz
Quiescent current (from the battery)	< 1 mA
Mains fuse	B16 A or C16 A
Degree of efficiency, max.	> 88%
IP rating	IP67
Protection class	I
Operating temperature	-30 °C ... +60°C
Dimensions (L x W x H)	195 mm x 98 mm x 47 mm
Weight	1.5 kg

5 Package Contents

Item	Qty
Battery charger	1×
User manual	1×

6 Charging Characteristics

Battery charging is fully automatic and micro-processor controlled with a 3-stage $I_{U_1}U_2$ characteristic curve for gentle and optimum charging of the batteries. The charging phase of the charger is indicated by the LEDs on the display of the unit (*About this Product* [▶ 7], Fig. 2, No. 6)

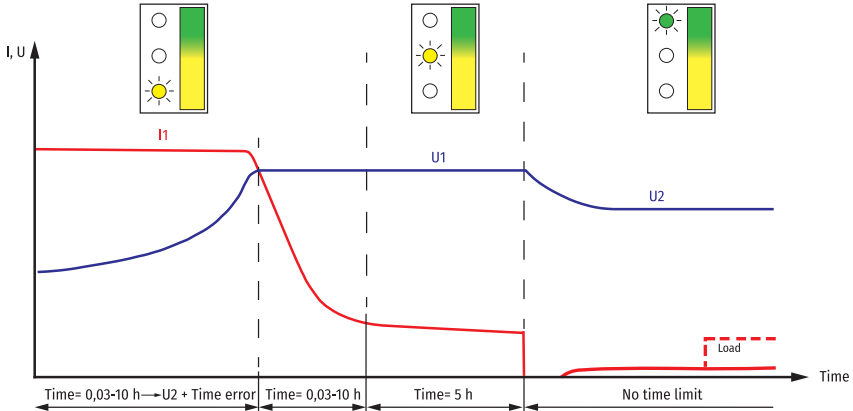


Fig. 3: Charging characteristic of lead-acid battery (wet, gel/AGM)

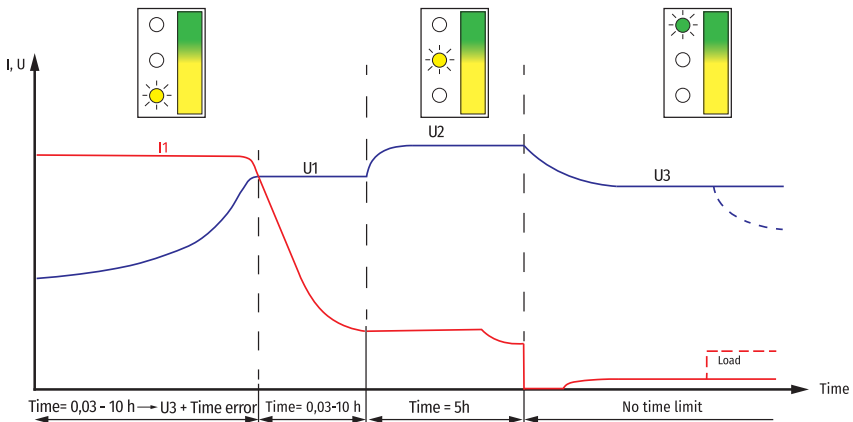


Fig. 4: Charging characteristic of traction battery



I phase: Charging with constant current

Depending on the state of charge, the battery is charged with maximum charging current to store as much energy as possible in the battery. After reaching the set main charging voltage, the charger switches to the next charging phase (U_1). If the set main voltage is not reached within 10 hours, the device enters the U_2 Phase and reports an error.

NOTE! Deep-discharged batteries are not charged for safety reasons. The charging process only starts when the battery voltage is at least 6 V for 12 V batteries or at least 18 V for 24 V batteries.

U1 phase: Main charging with constant voltage

In the main charging phase, the voltage is kept at a constant value. As the battery increasingly charges, the current decreases continuously and approaches a lower limit.

Battery	Type	Main charge voltage
Gel/AGM battery	12 V	14.4 V
Wet cell battery (standard)	12 V	14.2 V

Battery	Type	Main charge voltage
Gel/AGM battery	24 V	28.8 V
Wet cell batterie (standard)	24 V	28.4 V

U2 phase: Trickle charge with reduced voltage

In this phase, the charging voltage is reduced in order to maintain the battery charge for an unlimited period and counteract self-discharge. Additionally connected consumers are supplied via the charger in this phase without loading the battery.

Battery	Type	Charge voltage
Gel/AGM batterie	12 V	13.8 V
Wet cell batterie (standard)	12 V	13.6 V

Battery	Type	Charge Voltage
Gel/AGM batterie	24 V	27.6 V
Wet cell battery (standard)	24 V	27.0 V

Charging characteristic: POWER SUPPLY

Champ Pro chargers In the “Power Supply” setting can also be used without the battery connected to supply DC consumers. This setting can be used, for example, when replacing the battery in the vehicle to avoid on board computer and radio data loss due to the loss of power and having to be reprogrammed

Note that the power required must be no higher than the output power of the charger. In the “Power Supply” setting, the charger gives off a constant voltage of 13.7 V or 27.4 V. The green LED of the charge status indicator is continuously lit.



TIP

Reviving deeply discharged batteries

The “Power Supply” setting also allows deeply discharged batteries to be revived so that they are once again recognised by one of the automatic charging programs and can continue to be charged. Switch to the appropriate charging curve once the minimum voltage has been reached.

7 Assembly

To assemble the device, perform the following steps:



Notice

Device fault caused by overheating

The charger may heat up during use. If the operating temperature gets too high, this may result in reduced performance or the charging process being interrupted.

1. Do not mount the device directly next to or above batteries or other heat sources.

- ✓ A cool, well-ventilated assembly site is available.
- 1. Fasten the device to the 4 holes on the side (Ø 5 mm).

NOTE! Optimum cooling is achieved by mounting the unit vertically on a flat surface.

⇒ The device is assembled.

Setting the charging characteristic for the first time

To select a charging characteristic, perform the following steps:

1. Insert the mains plug into a corresponding mains socket.

⚠ CAUTION! The charger must only be operated at the mains voltage specified on the rating plate.

2. Within 3 to 6 seconds, press the Mode button (*About this Product [▶ 7]*, Fig. 2, No. 5) repeatedly until the LED next to the desired charging characteristic is lit on the display (*About this Product [▶ 7]*, Fig. 2, No. 4).

3. Disconnect the charger from the mains.

⇒ The charging characteristic is set.

8 Installation

Please note the following when installing the charger:



Notice

Incorrect installation can damage the device

The negative lead of the unit may contain a temperature sensor.

1. Never shorten or extend the negative cable with a temperature sensor.

Depending on the device variant, the DC cables are fitted with either a pre-assembled connector or ring terminals/bare wire ends.

DC cable with plug connector

To install the DC cable, perform the following step:

- ✓ The socket that matches the charger's plug is provided.

1. Connect the DC cable's plug to the terminal connected to the battery.

⇒ The DC cable is installed.

DC cables with ring terminals/bare wire ends

To install the DC cables, perform the following steps:

1. Disconnect the battery from the vehicle's electrical system.
 - ⚠ **WARNING!** First, disconnect the negative lead.
 2. Connect the red DC positive lead from the charger to the positive terminal of the battery.
 3. Connect the black DC negative lead from the charger to the negative terminal of the battery.
 4. Reconnect the battery to the vehicle's electrical system.
 - ⚠ **WARNING!** First, connect the positive lead.
- ⇒ The DC cables are installed.

AC cable

To connect the device to the mains, perform the following steps:

NOTE! The charger is only suitable for connection to fused, earthed mains supplies.

1. Plug the AC power cable into a suitable mains socket.
 - ⇒ One of the 4 charge characteristic curve LEDs flashes orange whilst the device is establishing a connection to the battery. No voltage is being output yet.
 - ⇒ After 2 seconds, the LEDs on the charge status indicator start to flash and charging begins.
 - ⇒ The charging progress is shown on the charging status indicator by the LEDs that are lit.
 2. Ensure that the charging curve appropriate for the battery type is selected. To change the charging curve, please refer to the section *Changing the charging curve* [▶ 20].
- ⇒ The AC cable is connected to the mains supply.

For further information on the charging process, please refer to the section *Charging the battery* [▶ 20].

9 Operation

9.1 Charging the battery

To start the charging process, perform the following step:

- ✓ The device is installed.
- ✓ The battery is connected.
- 1. Plug the AC power cable into a suitable mains socket.
 - ⇒ The charging progress is indicated by the illuminated LEDs on the charging status display (*About this Product [▶ 7]*, Fig. 2, No. 6).
 - ⇒ Charging starts automatically after 2 seconds and the yellow LED on the charge status indicator lights up.
 - ⇒ If the charging current is 15% below the maximum value, the yellow and green LEDs on the charging status indicator light up.
- ⇒ The battery is charging.
- ⇒ When the battery is fully charged, the green LED on the charge status indicator lights up. This indicates trickle charging.

9.2 Changing the charging curve

To change the charging curve, perform the following steps:







- ✓ The device is installed.
- ✓ The battery is connected.
- ✓ The device is disconnected from the mains.
- 1. Plug the AC power cable into a suitable mains socket.
 - ⇒ One of the four charging characteristic curve LEDs (*About this Product [▶ 7]*, Fig. 2, No. 4) lights up orange whilst the device is establishing a connection to the battery. No voltage is being output at this stage.
- 2. Press the Mode button (*About this Product [▶ 7]*, Fig. 2, No. 5) repeatedly until the LED next to the intended charging curve lights up.
 - ⇒ After 2 seconds, the LEDs on the charge status indicator start to flash and charging begins.
 - ⇒ The charging progress is indicated by the illuminated LEDs on the charging status display (*About this Product [▶ 7]*, Fig. 2, No. 6).
- ⇒ The charging curve has been changed and the battery is now charging.

9.3 Temperature sensor

Depending on the model, the charger has a temperature sensor located in the negative lead. The temperature sensor corrects the charging voltage as a function of the temperature in order to provide an optimal, effective and gentle battery charge.

10 Error messages

The following errors are indicated by the LEDs:

LED	Display	Cause	Action
	ERROR Steady red light	Overheating	Check the battery connector, check the battery voltage, disconnect the device from the battery and the mains, and allow it to cool down
	ERROR Flashing red light	Time-out during the main charging phase; charging process aborted	Faulty battery: check the battery Battery too large for the charger: choose a larger charger Too many loads connected in parallel: switch off loads whilst charging
	STANDARD	No charging curve has been selected.	Select the required charging curve by pressing the Mode button. Please refer to the section <i>Changing the charging curve</i> [▶ 20]
	GEL/AGM		
	POWER SUPPLY		
	TRACTION		
	Flashing orange light		

11 Maintenance

Check the device as follows before using it each time:

- Check the mains cable and mains plug for damage.
- Check charging cables and connections for damage.
- Check the charger for external damage.
- Ensure that the wiring between the charging cable and the charger is secure.



TIP

Battery maintenance

For battery maintenance, refer to the battery manufacturer's instructions.

12 Disposal



Dispose of the device in accordance with the Waste Electrical and Electronic Equipment Regulations (WEEE).

The system must not be disposed of with household waste. Take it to a recycling point or return it to your point of sale.

We make energy mobile.

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