

Europasolar GmbH

Uses sun energy and environmental awareness intelligence

Solar Charger LR 122430

Mounting instruction

Read instructions carefully !

Cordial congratulation on the acquisition of this loading regulator. You have acquired a product that has been manufactured according to the newest state of technology and offers you the possibility to use free and environmentally friendly source of energy - the sun. The LR122430 is an ultramodern loading regulator, equipped with the most modern technology sundry functions and is unique compared to other loading regulators. Please take time to read the mounting instructions.

The installation should only be executed by an expert.

Wrong installation leads to damages, and consequently loss of guarantee!

| | LR122430 in 12V usage | LR122430 in 24V usage |
|---------------------------|--------------------------|--------------------------|
| Max. load current | 30 A | 30 A |
| System voltage | 12 V | 24 V |
| Max. Solar module power | 430 Wp | 860 Wp |
| Max. open circuit voltage | 21,5 V | 42 V |

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Remark: "Security takes highest priority "

Translation : Wohnraumakku = If you use LR122430 in camper car then is this the accu to give power for living room equipment.

Motorakku = If you use LR122430 in a car then ,is this the accu what uses the motor from a car.

- Please always handle accu (batteries) carefully. Through escaping gases, hydrogen gas explosions (pop gas) can arise. A shortcircuit of the battery poles is very dangerous.
- Although only one system tension of 12V / 24V is to be used, for high performance, have the module field as well as the battery.
- The charging regulator should be installed inside the vehicle, preferably in a deep place, where the room temperature is lower.
- The regulator doesn't become hot in the normal operation. The internal prefabricated parts have approximately 3 W power dissipation. Consequently, the regulator temperature is only a little over the room temperature.
- Do not short circuit the PV – Module as this may destroy the the loading regulator.
- Do not measure the shortcircuit current of the modules when the loading regulator is connected to the Battery. This measurement can destroy your measuring instrument and the loading regulator.
- Do not come over the max. load current of the loading regulator.

1.0 LED - Display

The LR122430 Charge regulator have 3 LED Lamps.

| | |
|----------------------------|---|
| Wohnraumakku lädt | LED shine -> The load current goes into Wohnraumakku. |
| Motorakku lädt | LED shine -> The load current goes into Vehicle Battery (car accu). |
| Akku´s voll / Keine Ladung | LED shine -> there is Solar Energy, but this can't go to any accu because the max. load voltage is reached. |

When one LED shines, there enough energy to make a load current.

2.0 Mounting hints

2.1 Control and limits

- The LR122430 is made for 12 Volt or 24 Volt System. (How you place the jumper).
Never connect PV- Module with more than 42 V open circuit voltage.
- The Load Regulator is made for 30 A, should your wire not manage the current :
when you calculate 1 mm² for 10 A, change the fuse to a lower current.
Type: PUDENZ FK2 – (Sicherheitseinsätze) safety uses.(Fuses)
- The ambient temperature should not be over 60 °C. Do not leave the Load Regulator under direct sun light or other heat sources. Temperatures beyond this limit will destroy the Load Regulator.

2.2 Polarity protection

Although the LR122430 has a polarity protection, some parts can be damage if wrong polarity occurs. Please control every connection carefully and make sure that the polarity is correct.

2.3 Installation instructions

Procedure:

1. Examine the Loading Regulator for transport damages. Install, if possible, the Loading Regulator on a low location in the vehicle. Avoid direct contact with water. Protect the regulator from direct sun radiation and other heat sources. Leave a free space of 5 cm (2 in) around the case to cool down. If necessary, change the jumper so that the regulator is useable for your system voltage.

2. Ensure that the module field fits the loading regulator and the stated limits are observed. Several LR122430 loading regulators can be loaded on an accumulator with the output. Please observe the maximum loading current of the accumulator.

Standard value is Ah/10 e.g. 110 Ah / 10 = 11 Amp.

3. **Connection procedure:** Connect the regulator in accordance with the case print. Take note of the polarity: + pole and - pole.

If you don't use "Motorakku output", then connect a thin wire bridge between "+ Solarmodule" and "+ Motorakku" directly at the regulator clamps.

4. **Accumulator:** First connect the accu cable with the loading regulator, then the cable with the accu.

5. **PV (+ and -):** Check whether the batteries are correctly attached. Then connect the module cable with the input of the Regulator. When there is enough sun to the modules, then one LED shines, and 3 min later the Regulator switches to one Akku.

Attention:

As soon as the sun shines, the solar field produces power. Please take care not to short circuit during the connection as this could damage the loading regulator.

6. **Liquid and gel accu:** For optimization of the maximum load voltage, the loading regulator is delivered for 12V system and liquid accumulator. However, you can use it for on gas protected GEL - accumulator. Change the 2 bridges if you use gas protected GEL accu. For plug-in bridges: connect in bridge direction only.

7. In order to guarantee a sufficient lightning protection, you should earth your PV - installation. In LR122430 the negative contacts are very lowly bound. If possible, earth the - pole of the battery.

3.0 Operation

3.1 The regulator

The LR122430 is a fully automatic solar regulator with many protection functions for the PV - system and the regulator. The battery charge will go with the maximum solar current. So long as the max Load voltage of the Wohnraumakku output is reached, then, the regulator switches to the Motor akku output and loads these with the maximum current. If the Motor accu is also full to the max. voltage, then, the regulator switches to open circuit on the Module side. The module can now cool down thus ensuring that the life of the Modules extends.

- The regulator prevents a discharge during the night. An additional reverse current diode is not necessary.

- The loading regulator is made only for solar systems. Do not connect other chargers (Generator) to it.

- The connecting terminals are made for a cable dimension of 4 mm².

- **99,9 % free from wear:** The module current is switched over relay with 100000 switch guarantee at max load. Through the silver-alloyed contact, the switch contact has practically no power dissipation. The module maximum current can flow into the accumulator.

4.0 Trouble shooting

The LR122430 is made for the rough everyday use. Most PV - system problems emerge with the montage and with the consumers.

Subsequently, some problem sources and their elimination are discussed below.

Hint:

1. Errors should, in principle, be handled by qualified people.
2. Remember that a battery short can lead to serious damages.
3. Don't open the LR122430, it doesn't contain any parts that you can repair. It also contains no internal protection or other parts that can be shifted or repaired.
4. Heed all usual safety measures, if you work with Circuits under tension.

1. Battery doesn't load

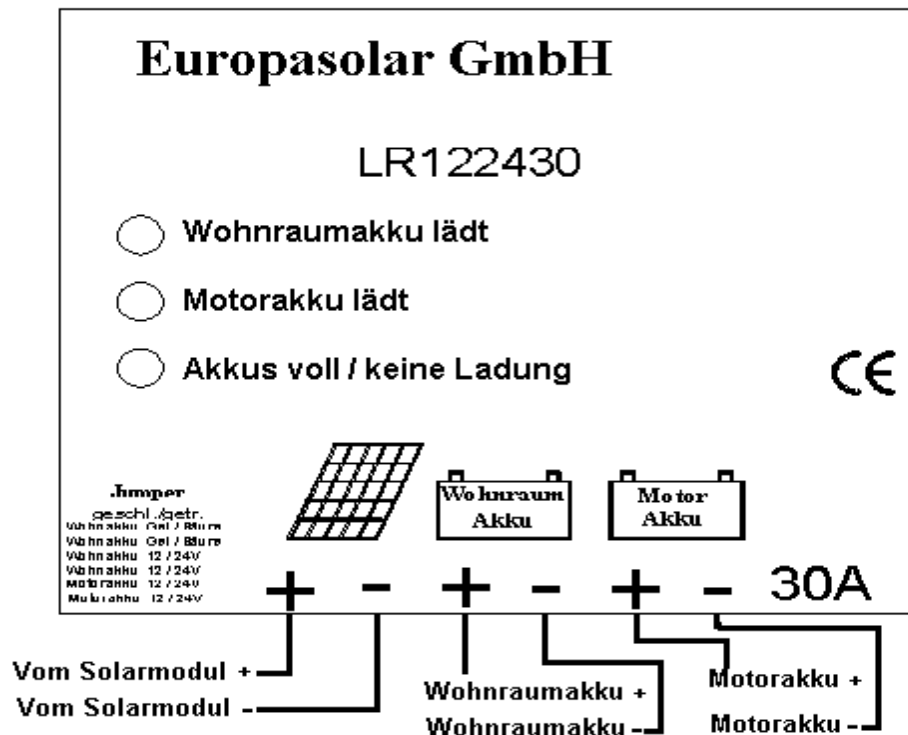
- Check the LED display of the regulator. With sufficient daylight, one LED should shine. If the Shine Wohnraumakku LED or Motorakku LED is not loading current, please control the 30 A fuse near Kabel connection.
 - Check whether the correct battery type is selected.
 - Check all connections in your system. Check the polarity (+ and -) on the connections.
 - Measure the tension of the PV-module and check whether it lies in the normal position. If it is too low or not measurable, check the connection of the PV - module. When you are working on the solar modules, you should disconnect the loading regulator.
 - Ensure that the load does not use more than what the solar module brings in.
 - Check the condition of the battery and whether during the night the accumulator tension falls quickly without load connection. If the accumulator can't hold the voltage, it should be replaced.
 - If all connections are in order and nevertheless no battery load, then separate all connecting loads from the accumulator -even those of the solar installation.
This must be done during the day, so that a current can go from the PV - modules to the loading regulator. Then measure the voltage on the battery connections. This voltage should be between 13 V / 26 V and 15,5 V / 31 V.
- If the measured voltage is under or over this range, it is possible that the loading regulator is defect.

2. Accumulator voltage is too high

- Check the surrounding conditions of the regulator, for example the ambient temperature. Ensure that the maximum is 60 °C.
- Ensure that the correct battery type is used - (closed / separate) jumper bridges.
- Check all connections in your system.
- If the voltage is clearly too high, you measure the regulator in accordance with the description. With voltage over 15,5 V / 31 V is a possibility of a defect. For a short time (max 3 min.) can the voltage be higher. This is OK, but then the regulator should be switched off.

5.0 Specifications of the LR122430 Solar charge regulator:

| Ambient conditions | | Switch points | 12V System | | 24V System | |
|--------------------------|----------------------|--|------------|--------|------------|--------|
| Max. Ambient temperature | +60 °C | Load with maximum module current up to | | | | |
| Max Humidity | 95 % | Max. load voltage | Gel | Acid | Gel | Acid |
| Mechanical data | | | | | | |
| Dimensions (mm) | 100*90*35 | Max. load voltage | 13,8 V | 14,4 V | 27,6 V | 28,8 V |
| Weight | 230 g | Switches on if lower than | 12,6 V | 13,2 V | 25,2 V | 26,4 V |
| Cable connections | 6 * 4mm ² | | | | | |
| Own power use | | | | | | |
| Night | 0,6 mA | | | | | |
| When loading | 0,11 A | | | | | |
| When low voltage | 0,6 mA | | | | | |



Europasolar doesn't take any liability for damages arising from improper mounting or failure to follow the installation instructions.

Europasolar is available to you for further enquiries. We are specialists in handling small to big installations and in particular for the solar technique of rotatory installations in and outside Germany.

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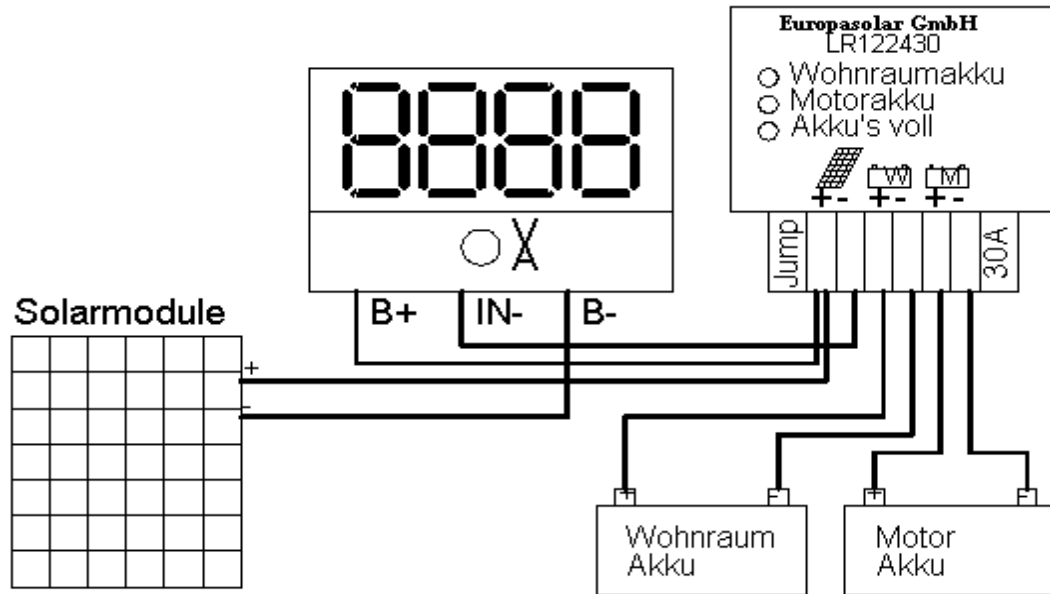
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Technical subject to alteration. We don't take liability for misprints.

This circuit shows the loading current or the accumulator voltage during the loading process

Schaltung mit V / A Anzeige für beide Akkukreise

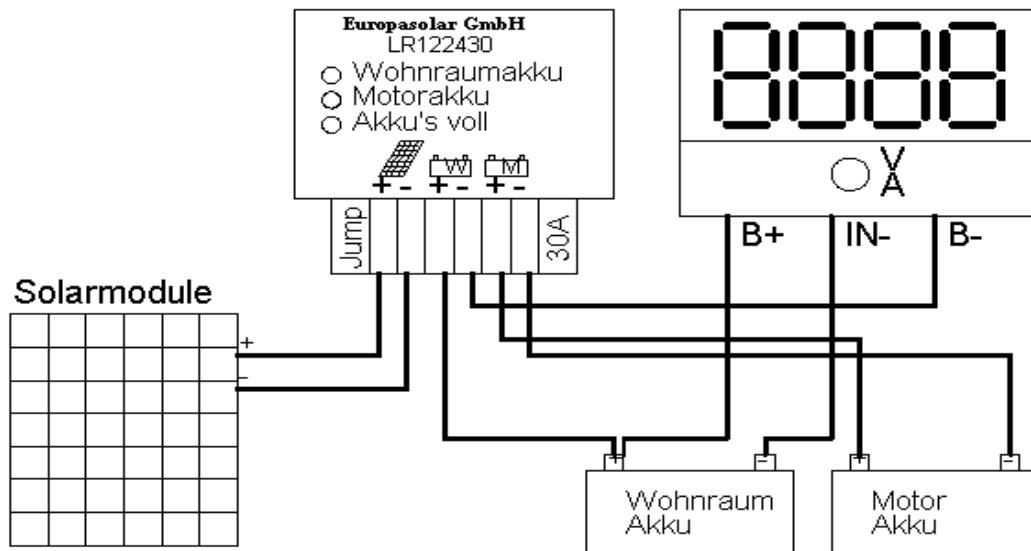


(According to the switch position at the display).

Important:

When the two accumulators are full, the empty module load is shown on the display, with a current from 0,00A

Schaltung mit V / A Anzeige nur Wohnraumakku



This circuit shows you the accumulator voltage of the Wohnraum accu or the loading current of the Wohnraum accu, according to the switch position at the display.

Without sun light at the modules, the Display shows the accumulator voltage of the Wohnraum accu.

(Switches in position V).

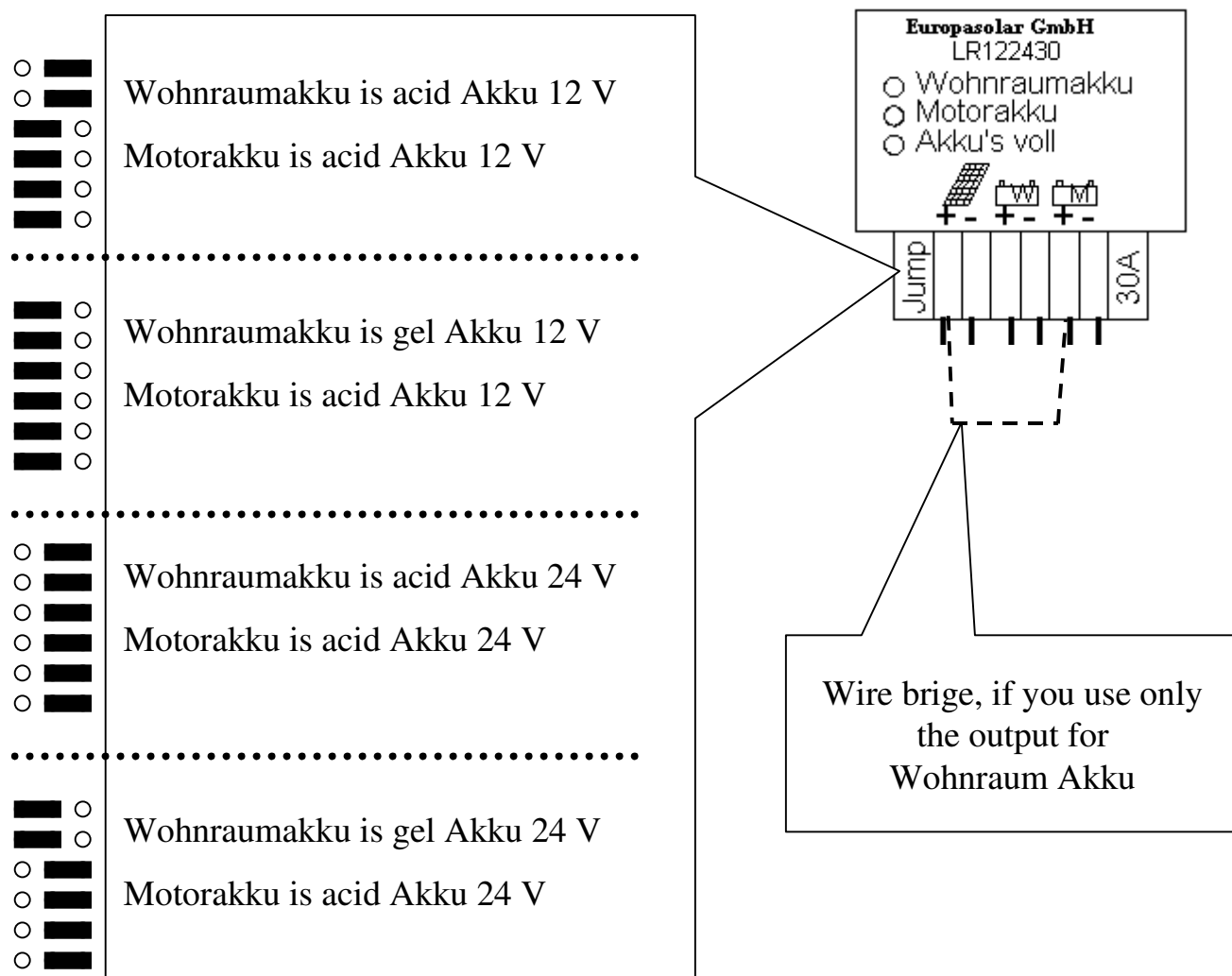
Possible Jumper attitudes and system combinations

The regulator can work with 12V or 24V systems.

The Wohnraum accu and the Motor accu must have the same system voltage.

The solar module must be made for the system voltage.

The Wohnraum accu is loaded, if solar voltage is large enough and the accumulator voltage is less than 12,6V / 25,2V.



Please also look for the delay times, that are built-in in the regulator:

- When Solar voltage is large enough and Akku voltage small enough, it takes from about three minutes for the regulator to switch to the accumulator.
- When the Akku voltage has reached maximum, it takes from about 15 seconds for the regulator to switch off the current or switch on to the other accumulator.
- Should the regulator switch the accumulator on and off in a regular 15 seconds Rhythm and then again, this indicates a problem; for example:
 - No connection between regulator output and accumulator, (check on the fuse on the Regulator).
 - Accumulator cannot sink up (absorb) the loading current quickly such that the maximum voltage is reached immediately.
 - Accumulator has not enough storage capacity.(Water condition tests).

Solar participation at rotatory installations.

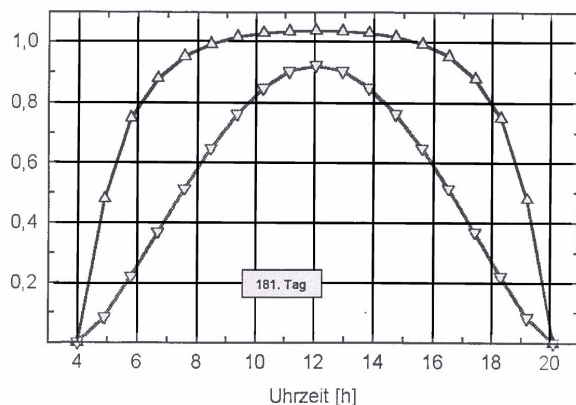
Through the alignment with the sun, one can achieve up to 35 % more energy profit compared to 35 degrees southward solar module installation.

Here is a comparison diagram from the UNIVERSITY ESSEN.

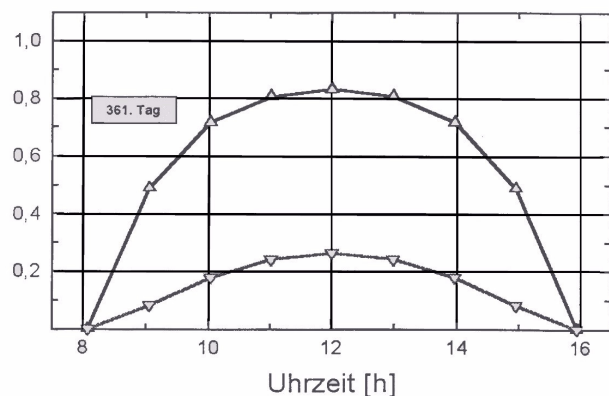
The south installed solar modules has the low curve:

Rotatory solar system has the high curve:

Summerday e.g. 01.07.



Winterday e.g. 25.12.



Strong mechanics and robust technology are prerequisite in order to guarantee low-maintenance usage of more than 20 years. Dynamic wind loads up to 80 km per hour cannot lead to function impairments.

Surface area requirements: from 45 m² , 75 m² and 660 m².

This means: the profitability of your investment is decisively permanently improved.

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