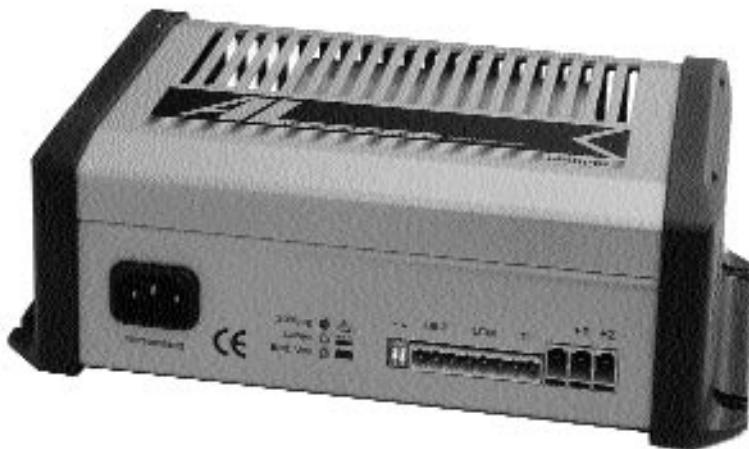


AUTOMATIKLADER



AL 12/10 AL 12/15 AL 24/8

Introduction

The automatic charger is directly constructed for the electrical system on board the yachts of today.

Three separate output characteristics make it possible to charge all types of users and batteries. The IUoU charging curve charges lead accumulators with liquid or with gel type electrolyte. The charging of any battery will be precise with the help of an external sensor. Every charge procedure is fitted thereby, to the temperature of the battery.

1. Features

Simultaneous charging of batteries and supply of consumers

During connection to electrical mains, all consumers supplied by battery will further receive current through charger, even while batteries are being charged. The charger is thereby used as a main power supply.

Automatic charging process

The newly developed control eliminates dangerous gassing. Optimal charging conditions result from the IUoU characteristic curves and automatic temperature compensation in "output" voltage ensures optimum charging conditions and prolonged battery life. The trickle charge is ideal for maintaining both batteries charged up through the winter.

Charging of up to three battery systems simultaneously

Neither charger or battery will receive damage through false connection. The charger has a short circuit and reverse battery protection.

Carefully combined materials like Aluminum (AlMg3) and stainless steel (A2) assures consistency and long durability.

2. Safety instructions

No change in the equipment may be made, otherwise the CE indication expires.

The electrical connection of the charger may be made only by professionals. To only particularly trained maintenance and repair personnel it is allowed to examine and repair the charger.

During the operation the frame cover may not be removed.

A handicap of the exhaust of the charger can lead to an overheating and thus to a loss. Ventilation openings do not cover.

The housing of the charger becomes hot during the operation, since this serves at the same time as radiator box.

Disconnect the positive batteries connections before beginning the installation. To the correct polarity of the batteries pay attention! For the security of the equipment and the battery an active reverse protection looks for the correct polarity when starting the charger.

The available assembly and operating instruction are a component of the component supply. It must be kept - importantly for later maintenance work - well and be passed on to possible subsequent owners of the equipment.

Non-liability:

Both the adherence to the operating instruction, and the conditions and methods when installation, enterprise, using and maintenance the battery charger cannot be supervised of philippi electrical systems.

Therefore we do not take any responsibility and adhesion for losses, damage or costs, which develop themselves from incorrect installation and inappropriate enterprise.

We carry warranty out for the supplied mechanism loaders due to our "general trading conditions". These trading conditions are basis of all sales and delivery offers, they are printed and attached to all offers and confirmation of orders in our catalogs.

3. Scope of supply

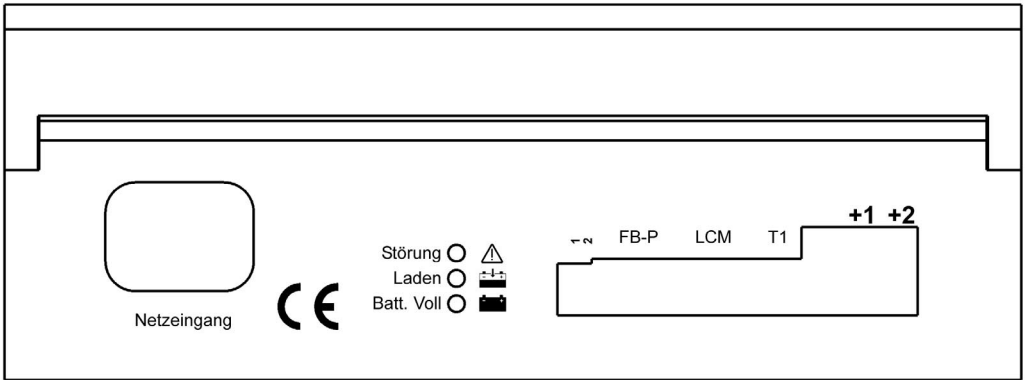
Standard content:

Charger with AC cable
Operation instruction

Additional:

Status control: FB-P
Remote display: LCM
Cable harness: KS 2m
Temperature sensors: Temp-AL

4. Installation



The charger is intended for the wall assembly. Over four fixing bolts the charger can be easily installed. A assembly on the bottom is also permissible. Please ensure that chargers are installed where is sufficient air circulation to cool the power electronics and transformer.

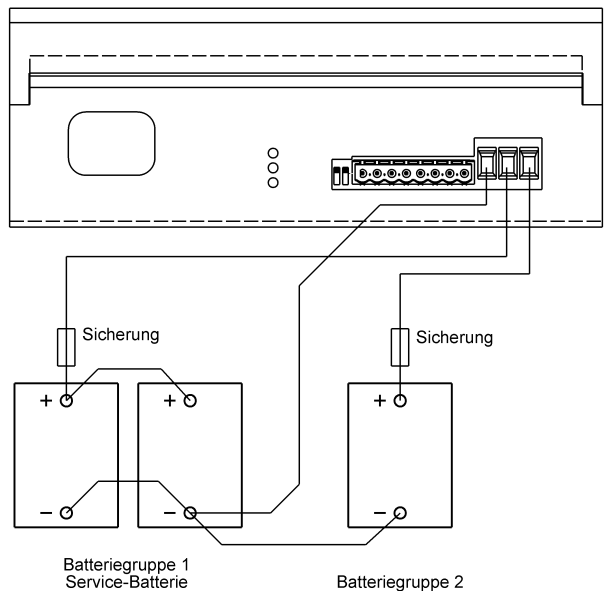
Chargers should not be installed in the battery space nor a gasoline engine room nor where the fuel tanks are located, due to explosion hazard arising from gassing vapours (oxyhydrogen) of batteries or gasoline fumes. Please ensure that the chargers are properly fastened down mechanically.

4.1 Electrical connection AC

The mains connection is made by the provided mains cable with cold equipment clutch and protective contact plug. The protective contact plug may not be cut off, but it must be present a protective contact socket as interface. It is recommended, to switch the charger over an external switch in the net inlet on and off.

4.2 Electrical connection DC

The battery connection takes place on the front at the plug-able clamp in accordance with the diagram of connections. For a professional and reliable connection the ends of the load lines must be crimped with the suitable pigtails. To ensure a suitable connection, the screws of the clamps must be tightened with a slotted



bolt turner 4,5mm and/or screwdrivers of size 2 (Pozidrive). If only one batterie (group) will be connected, then this is to be attached to exit +1. Further groups of batteries are attached at the exits +2

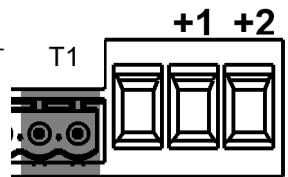
It is to be made certain absolutely that the polarity of the battery is considered. Keep the wiring between battery charger and the batteries as short as possible. Shift if possible no lines of receiving equipment parallel to the loading and main lines to avoid HF disturbances. Use as possible colored lines for battery cabling. If not possible, mark the cables with colored insulating tape. The indicated minimum cross sections of a line are to be kept absolutely.

Charging current	recom. fuse size	Cable length <2m	Cable length >2m
10 A	15 A	1,5 mm ²	2,5 mm ²
15 A	20 A	2,5 mm ²	4 mm ²

The plus load lines must be secured in the proximity of the batteries by suitable fuses or breakers. The fuse size should be appropriate for something over the nominal charging current of the battery charger. Examine the wiring annually. To thin cables and/or loose connections can have dangerous overheatings at cables and installation to the consequence. Pay attention to firm connections, in order to avoid high transition resistances.

4.3 Connection of the optional temperature sensor

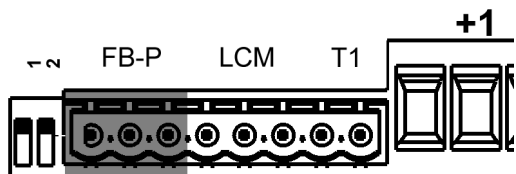
The temperature sensor measures the temperature of the battery. It should be attached therefore at the exterior of the battery. It is sufficiently if this by means of tape at the exterior of the battery is fixed. The housing of the temperature sensor is electrically isolated. The electrical connection of the temperature sensors takes place at the lower row of terminals on the front side of the charger. The cable length of the temperature sensor amounts to 2.8 m, if this should not be sufficient it can be extended or shortened without limits. If no temperature sensor is attached, then the charger works with the standard voltage levels, which correspond to a temperature of 20 °C.



4.4 Connection of charging control (Optional: FB-P)

External charging control (option) is left justified put in at the upper row of terminals on the front side of the charger.

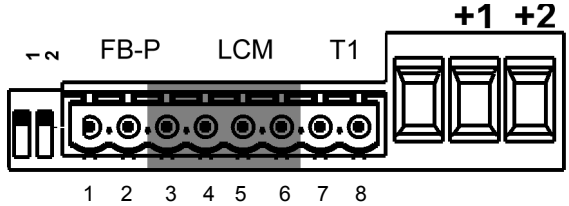
- terminal No. 1: white line (+ LED ye)
- terminal No. 2: brown line (+ LED gr)
- terminal No. 3: green line (- Minus)



4.5 Connection of the display (option LCM)

The connector of the external display LCM (option) is to put in right-justified at the upper row of terminals on the front side of the charger:

- Pin Nr. 3: screen
- Pin Nr. 4: brown line
- Pin Nr. 5: white line
- Pin Nr. 6: green line

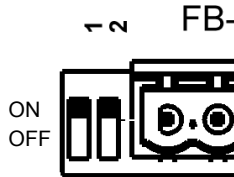


4.6 DIP-switches

The DIP switches are at the front side (not at AL 12/10),

Changes in the Dip switches may be made only with switched off charger !

Dip-switch	OFF	ON
1	liquid	Gel / AGM
2	+2 Service	+2 Start



Factory-installed all Dip switches are posed on ON.

(1) Gel.- / Liquid-Batteries

Charging voltage Gel / AGM: 14,4V/13,8 V, bzw. 28,8V/27,6V.

Charging voltage liquid: 14,3 V/13,6 V bzw. 28,6V/27,2V.

please find also chapter 4 (Charging)

(2) Outlet +2

With starter mode charge will done with with reduced tension (-0,7V).

With service mode charge will be done with full output voltage such as outlet +1.

5. Operation

Switch on:

As soon as the charger is connected to the mains voltage, it goes into enterprise. By means of the IUoU characteristic with temperature compensation the charger can remain constant in enterprise, without damaging the batteries.

5.1 Control lamps

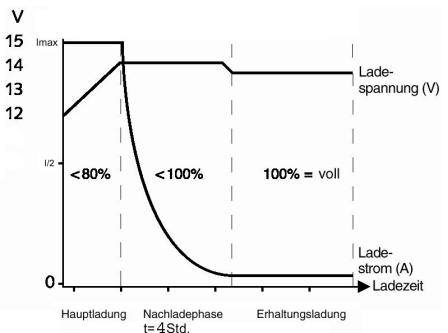
To monitor the charging progress and the operating condition 3 colored control lights are inserted in the front of the charger. These indicate the following operating conditions of the charger.

control light	Operating condition		
red yellow green			
● ●	Power supply mode		
●	The batteries are charging (IU-Phase).		
	●	The batteries are fully charged and now the tickle charge is running.	
○	No battery is connected, short circuit, reversed connected or unloaded under 3 V or. 6 V (24 V Unit).		
● ○	The maximum charger temperature of 70 °C was exceeded. The charger limits the current, so that no further heating up takes place.		
● ○ ○	The batteries temperature run out of the range (-10 - 50 °C). The charging will be stopped until the batterie temperature will be back in the range.		
● ● ●	A temperature sensor ist short circuited. The charging will be stopped until the short circuit is removed.		

● LED leuchtet ○ LED blinkt

5.2 Charging

The outlet +1 is the main exit, after the charge is primarily controlled. The batteries attached to outlet +1 are always charged with a IUoU characteristic (except power supply unit mode, then only IU characteristic curve). Further groups of batteries are attached at the outlets +2 and +3, which can be set individually to service -oder starter characteristic. The attached batteries are loaded with the rated current up to reaching the gassing voltage. After reaching the gassing voltage the charging voltage is kept constant on this (absorption phase). Thereby the

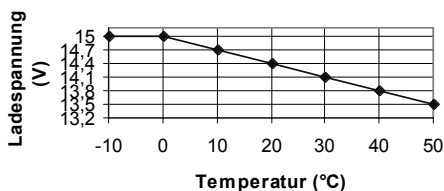


charging current sinks since the charging voltage is not any longer increased.

After the absorption current is sunk under 50% of the nominal value the charging voltage still 4 hours held at the gassing voltage around an optimal volume charge to reach. After this, the charging voltage is reduced down the floating voltage, in order to compensate the self discharge of the batteries. Likewise to the battery attached consumer is along-supplied by the battery charger.

The gassing voltage of a lead-acid battery depends on the temperature. By means of a temperature sensor the battery (environment) temperature is seized and those max. charging voltage automatically adapted. Thus during the charging at different temperatures the gassings voltage of a lead-acid battery is never exceeded. If no temperature sensor is attached, with the voltage levels one loads, which correspond to a temperature of 20°C.

Temperaturabhängigkeit der Gasungsspannung einer 12V-Blei-Gel-Batterie



6. Important hints for the operation

- Not used outlets have to be set to service battery use.
- The battery (group) with the largest capacity/demand must be attached on outlet +1.
- If only one group of batteries ist connected, then this is attached to the outlet +1.
- The charger adapts to an input voltage of 120 V automatically. From the low input voltage audible noises in the switch power pack result. Around these to reduce the charging current should be halved at the load monitor LCM or the Sleep mode be activated.
- Is the equipment defectively must it directly to the manufacturer be sent in, repair attempts third lead due to the complexity of the equipment not to success. Also an exchange of the safety devices is to be avoided too omitted around a further damage of the equipment.
- Due to the extensive output configuration of the 3 outlets small crosswise currents between the groups of batteries during the charging will appear. These are however harmless for the battery charger and the attached batteries.
- Both gel and liquid acid batteries are connected, then we recommend the charge in the gel mode.
- AGM batteries must be loaded in the gel mode.

7. Technical datas

Automatiklader	AL12/10	AL 12/15	AL 24/8
Input voltage / frequency		180-264 V	
Full load consumption	1,2 A	1,7 A	1,7 A
Full load consumption	280 VA	390 VA	390 VA
Rated battery voltage	12 V		24 V
Output voltage @20°C bulk / absorption	Gel/AGM 14,4 V Naß 14,3 V		Gel/AGM 28,8 V Naß 28,6 V
Output voltage @20°C float	Gel/AGM 13,8 V Naß 13,6 V		Gel/AGM 27,6 V Naß 27.2 V
Charge current (+/- 1A) recommended	10 A	15 A	8 A
total batteries capacity	30- 100 Ah	50-150 Ah	25-80 Ah
Characteristic		IUoU	
Temperature range	-10 °C / +40 °C, with following power reduction		
Cooling	self cooling		
Weight		1,2 kg	
Protection			
Dimensions BxTxH (mm)		250x142x84mm	

8 Declaration of conformity

Manufacturer: philippi elektrische systeme
 Address: Neckaraue 19
 71686 Remseck - Germany

Herewith declares that:



the chargers are in conformity with the provision of the EC EMC directive 89/336/EEC and amendments 92/31/EEC and 93/68/EEC.