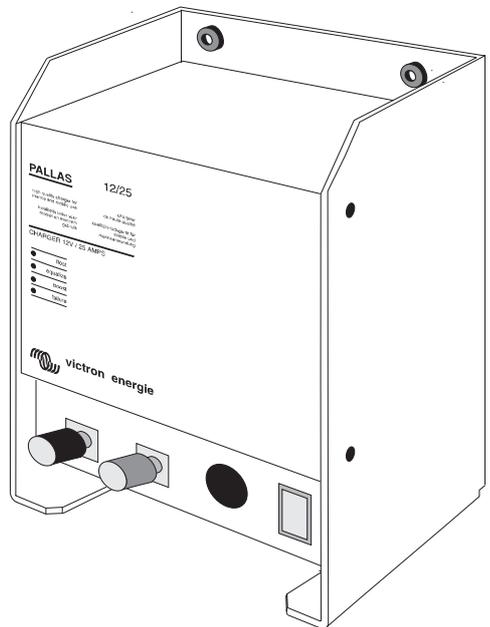




**USER MANUAL**  
**GEBRUIKSAANWIJZING**  
**GEBRAUCHSANWEISUNG**  
**Victron Pallas 12/25**



Color profile: Disabled  
Composite Default screen



**victron energie**

pa03001e.chp  
Fri Jan 26 13:14:43 1996

## **SECTIONS**

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<b>ENGLISH</b>	<b>1</b>
<b>NEDERLANDS</b>	<b>35</b>
<b>DEUTSCH</b>	<b>69</b>

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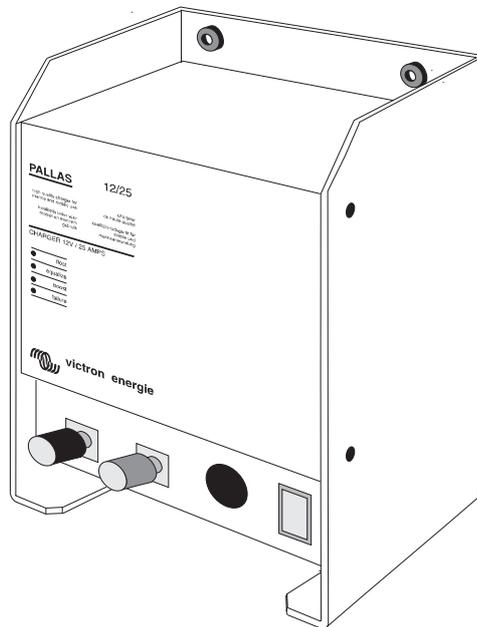


**victron energie**

## ENGLISH

# USER MANUAL

## Victron Pallas 12/25



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## INTRODUCTION

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Victron Energie has established an international reputation as a leading designer and manufacturer of power systems. Our R&D department is the driving force behind this reputation. It is continually seeking new ways of incorporating the latest technology in our products. Each step forward results in value-adding technical and economical features.

Our proven philosophy has resulted in a full range of state-of-the-art equipment for the supply of electrical power. All our equipment meets the most stringent requirements.

Victron Energie systems provide you with high-quality AC supplies at places where there are no permanent sources of mains power.

An automatic stand-alone power system can be created with a configuration comprising a Victron Energie inverter, battery charger, mains manager (if required) and, last but not least, batteries with sufficient capacity.

Our equipment is suitable for countless situations in the field, on ships or other places where a mobile 230-Volt<sub>ac</sub> power supply is indispensable.

Victron Energie has the ideal power source for all kinds of electrical appliances used for household, technical and administrative purposes, including instruments susceptible to interference. All of these applications require a high-quality power supply in order to function properly.

### **Victron Pallas battery charger model 12/25**

This manual contains directions for installing the Pallas battery charger model 12/25. It describes the functionality and operation of the Pallas battery charger, including its protective devices and other technical features.

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## 1. DESCRIPTION

### 1.1 General

All Victron Pallas 12/25 battery chargers are subjected to full functional testing before leaving the factory. They are properly packed for secure transportation.

**IP20=**  
protection against  
solid matter larger  
than 12 mm (e.g.  
a finger

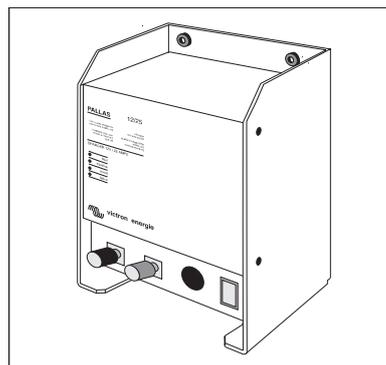
The Pallas charger is housed in a IP20 specification aluminum case designed for wall or floor mounting. The mains input, battery output and alarm output (if used) connections are made through the under side of the housing.

### 1.2 Pallas charger

The Pallas charger is designed for a 12V lead-acid battery system. The maximum charging current is 25A and the recommended battery capacity is 100-200Ah. The standard Pallas charger is suitable for traction batteries. Please consult your local Victron Energie agent for more details.

**Ah =**  
Ampere hours

The Pallas charger is a fully automatic battery charger. It is powered by 230V 50/60 Hz nominal supply main. It is designed to be permanently connected to the lead-acid batteries. It is no longer necessary to disconnect the charger during long term storage, for example during winter storage.



### 1.3 Operation

The Pallas charger will charge the battery as soon as the power switch is turned on, provided there is a mains supply. If automatic charge mode is selected (see connection diagram), the battery will be charged with the built in IUoUo characteristic. The float voltage is factory preset to 13.5 V. The equalize voltage is factory preset to 14.25 V. The boost and float voltages are user adjustable (see chapter 6).

**Warning: Because of the extremely high voltages permanently present within the Pallas charger, we insist that only a qualified electrician makes all the connections and adjustments within the charger. Make sure the Pallas charger is turned off when connecting, and use an insulated electrician's screwdriver to make all connections and to adjust the voltage and current control.**

## 2. PROTECTION



The Pallas charger is inherently safe due to its robust design and internal safety features.

**short circuit current = current supplied when a short-circuit on the output occurs.**

### 2.1 Short circuit protection

The output current is fully short circuit protected. The output current is internally limited under all conditions (see specifications). The battery cables are thus protected in the event of a short circuit.



### 2.2 Temperature protection

If the internal temperature of the Pallas charger increases, the output current decreases accordingly. Under extreme conditions (the ventilation holes could be blocked) the internal temperature will become too high, and the machine will shut itself down. When the internal temperature is again within limits, the Pallas charger will resume operation.



### 2.3 Input protection

The input of the Pallas charger is protected by a 10A T fuse.

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## **3. COMPENSATED CHARGING**

The Pallas has a temperature compensation facility which adjusts the charger voltage to the battery temperature.

**V.T.S. =  
Victron  
Temperature  
Sensor**

In order to use this facility, a temperature sensor (V.T.S.) must be fitted to the battery. This is because a higher charging voltage can be used with a cold battery than with a warm battery. The reference charging voltage is 14.25 V at a battery temperature of 20°C (see illustration 1).

### **3.1 Connection of temperature sensor**

In order to connect the temperature sensor, jumper S1 must be placed over pins 1 and 2 (see Drawings section, drawing no. PA03004E, page 33). The yellow temperature sensor LED will light up if the temperature sensor is connected. (for information on jumpers, see section 6.4, "Jumpers").

### **3.2 Battery temperatures of up to +10°C**

At temperatures of up to +10°C, the charger supplies a maximum charging voltage of 14.75 V. This output voltage is limited because at higher voltages problems might occur in the external equipment (see illustration 1, section "A").

### **3.3 Battery temperatures between +10° and +50°C**

In this temperature range, the output voltage is dependent on battery temperature (as measured by the sensor). As the temperature increases, the output voltage of the charger decreases by 30 mV/°C (5mV/°C per cell). (See illustration 1, section "B").



### 3.4 High battery temperature

At battery temperatures of +50°C and above, the charging voltage drops sharply. At values of 55°C and above, the charger operates as a rectifier with an output voltage of 12 V (see illustration 1, sections “C” and “D”).

Drawing PA03004E (page 33) shows where the temperature sensor must be fitted. It is also necessary to change jumpers S1 to pins 1 and 2 on the control PCB (see section “Drawings”, drawing number PA03004E, page 33)

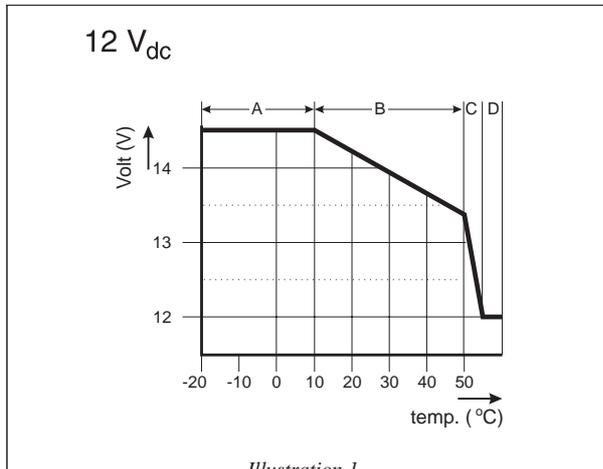


Illustration 1.

## 4. INSTALLATION



### 4.1 Mounting

Wall or floor mount the Pallas charger in a dry, well ventilated area. Excessively high ambient temperatures may adversely affect the output current and the lifetime of the Pallas charger. Best results are obtained in such conditions if the Pallas charger is wall mounted. For secure placement, the Pallas is supplied with mounting holes both in the rear and in the bottomside, see drawing PA03005E on page 32.

Make sure the front panel can be reached after installation. The Pallas charger and the battery's should be placed close together to keep the battery cables as short as possible, ensuring optimal loading.

### 4.2 Installation requirements

The Victron Pallas charger should be installed with the help of the following equipment:

- two battery cables (max. length 6 meters, with clamps)
- screwdriver (no. 2) to connect an earth cable

### 4.3 Connections

The Pallas 12/25 is fitted with a mains cable. The connections for the battery are on the front of the housing.

**Victron battery chargers are designed to charge batteries; the charger always expects the load of a battery and it is not a power supply. Connect the battery before switching the charger on and switch the charger off before the battery is disconnected.**

#### 4.3.1 Earthing

The Pallas charger is not a double insulated charger. The PE terminal must be connected to a true earth under all conditions. On a boat, the earth terminal on the under side of the housing must be connected to the ground plate or the hull. The shore connection must be earthed to the PE terminal on



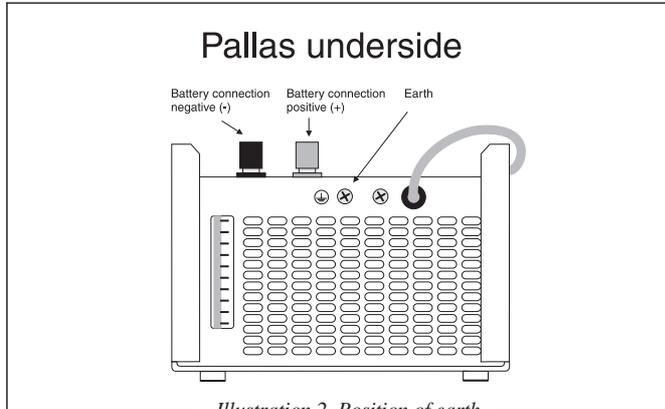


Illustration 2. Position of earth-  
ing screw on the Pallas 12/25

the mains input connection block. For mobile applications (car, caravan et cetera) earth terminal must be connected to the metal chassis.

#### 4.3.2 Battery output

It is important that the connection between the Pallas charger and the battery is made in such a way that power loss is minimized. The cables must be as short and as thick as possible to reduce resistance. We recommend using cable shoes as supplied. We recommend the following minimum copper cross section for these battery cables:

Pallas type	Length	cross section
12/25	0 - 1.5 meters	6 mm <sup>2</sup>
	1.5 - 6 meters	10 mm <sup>2</sup>



Cable lengths in excess of 6 meters are not recommended.

#### 4.3.3 Temperature sensor

The Pallas chargers can be equipped with a temperature sensor (V.T.S.) connected to the battery. The sensor measures the battery temperature continuously, allowing the charge voltage to adjust to the temperature of the battery.

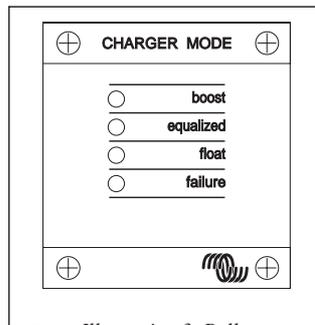
To correctly connect the V.T.S. jumper S1 must be placed on pins 1 and 2, drawing PA03004E on page 33. For further information on jumpers see paragraph 6.4. If the positive and negative poles are connected incorrectly the yellow LED will not light up.

#### 4.4 Starter Battery

Connect the starter battery to terminals 1 and 2 of the “re-mote” terminal block (1 is the “-” and 2 is the “+” of the battery). A wire thickness of 1.5 mm<sup>2</sup> is sufficient for connecting this battery.

#### 4.5 Remote control

The Pallas charger can be equipped with a remote control unit, the Pallas Charger Mode unit is shown in illustrations 3. The front has LEDs displaying, “boost”, “equalize”, “float” and “failure”.



*Illustration 3. Pallas  
Charger Mode unit.*

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## 5. START UP



### 5.1 Operating

On the front panel of the Pallas charger, see illustration 4, a power switch and the following indicators can be found:

**LED =**  
 Light Emitting  
 Diode

Indicator name	description
on	Indicates whether the Pallas charger is turned on
boost	Indicates charger is boost charging the batteries
equalize	Indicates charger is charging the batteries to 100% capacity
float	Indicates charger is maintaining the battery charge
failure	Lights if S1 is set for temp. comp. loading (pins 1 & 2 connected) but no temp. sensor is connected or the temp. sensor detects a battery temperature which is too high.

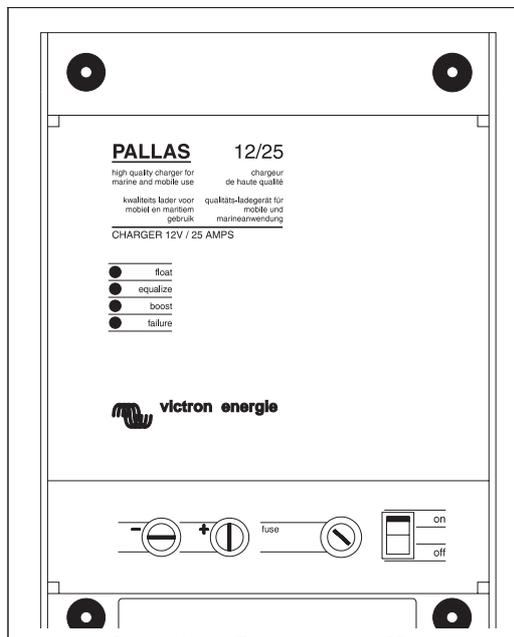


Illustration 4. Frontpanel of the Victron Pallas 12/25

Automatic charging will commence approximately 10 seconds after the mains have been connected and the switch “charger on” is set in the “on” position; the LED “on” will light up immediately.

## 5.2 “boost-float” cycle

### 5.2.1 “boost” period

During the “boost” period, the “boost” LED is turned on and the batteries are charged with the maximum charging current. The battery voltage will increase until it reaches 14.25 volts, at which point the “boost” LED will turn off. This marks the start of the equalize period, which will last for 4 hours.

### 5.2.2 “equalize” period

During this period the charging current will decrease. After 4 hours the batteries will have been charged to 100% of their maximum capacity. After the “equalize” period is over, the “equalize” LED will be turned off, the “float” LED will light up and the “float” period will start.

### 5.2.3 “Float” period

During the “float” period the “float” LED will light up and the output voltage will be 13.5 Volt<sub>dc</sub>. If the output voltage decreases to below 12.5 Volts, the “boost” period will start. This might occur if the load is too large or if the charger is temporarily turned off.

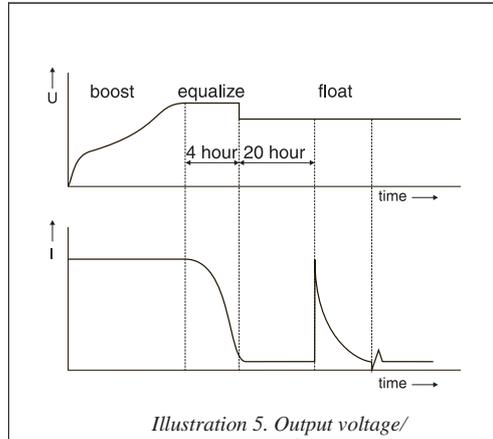


Illustration 5. Output voltage/  
current to time characteristic.



## 6. CALIBRATION

### 6.1 Adjusting the charge voltage

The float voltage is factory preset to 13.5 V. The equalize voltage is factory preset to 14.25 V. The equalize and float voltages are user adjustable. These values are recommended by almost all lead-acid battery manufacturers. The current and voltage settings do not have to be periodically checked.

**Warning: Because of the extremely high voltages permanently present within the Pallas charger, we insist that only a qualified electrician makes any adjustments within the charger. Make sure the Pallas charger is turned off when connecting, and use an insulated electrician's screwdriver to make all connections and to adjust the voltage and current control.**

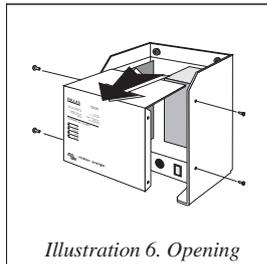


Illustration 6. Opening the cabinet.

To adjust the charge voltage unscrew the four counter-sunk screws in the sides of the Pallas, with a Phillips screwdriver, and pull the panel outward.

#### 6.1.1 Setting the charge voltage.

The Pallas charger uses two different charging voltages, the “equalize” charging voltage and the “float” charging voltage. These voltages can be set independently, with potentiometer R83 and R84 respectively.

#### 6.1.2 Setting the “equalize” voltage

While adjusting the charger voltages, the batteries should be well charged (the charging current should not exceed 5 Amperes) and the charger should be in “equalize” mode (the “equalize” LED should be on). Connect a digital voltage meter, with a 0.1 Volt resolution, to the output. Adjust R84 until the required output voltage is reached.



### 6.1.3 Setting the “float” voltage

It is possible, for test purposes, to set the charger in continuous float mode by placing jumper S6. The jumper should be removed again after the float voltage has been set by adjusting R83.

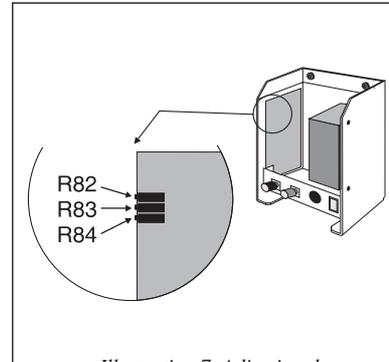


Illustration 7. Adjusting the “equalize” (R84) and “float” (R83)

### 6.1.4 Adjusting charging voltage for use with a diode splitter

A diode splitter can be connected to the Pallas charger. The output voltage must be increased to compensate for the voltage drop over the diode splitter and a capacitor of 22.000 $\mu$ F must be connected to the output poles of the Pallas charger. The “float” and “equalize” voltages can be set separately by adjusting R83 and R84. The output voltage should then be measured after passing through the diode splitter. The voltages should be 14.25 Volt (“equalize”) and 13.5 Volt (“float”).

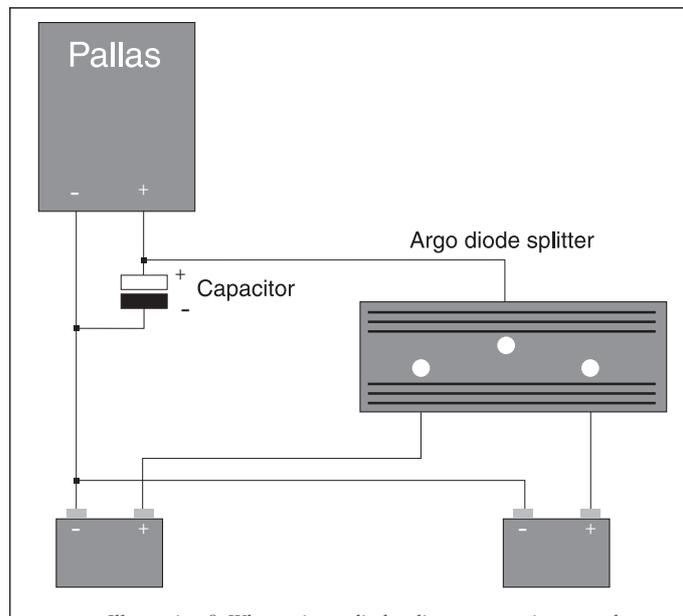


Illustration 8. When using a diodesplitter, a capacitor must be placed between the output poles of the Pallas charger.

### **6.1.5 Adjusting charging voltage for use with traction batteries**

When using the Pallas charger to charge traction batteries, jumpers S3 and S4 should be removed. This will increase the output voltage level by a set amount. Refer to the battery specifications for the correct output voltage level. This can be set by adjusting R83 and R84.

**Warning: Because of the extremely high voltages permanently present within the Pallas charger, we insist that only a qualified electrician makes adjustments in the Pallas charger. Make sure the Pallas charger is turned off when connecting, and use an insulated electrician's screwdriver to make all connections and to adjust the voltage or current control.**

### **6.1.6 The maximum charge current**

The maximum charge current can be set by adjusting R82, see illustration 7. While setting the maximum charging current, the output voltage should always remain 12 Volts. The maximum charging current should never exceed the factory set value for that specific charger type.

## **6.2 Maintenance**

The Pallas charger requires no special maintenance. It is however recommended that the electrical connections be checked twice a year, and that the charger is kept dry, clean and dust free. If any problems arise, use the fault finding procedure in this manual to trace the fault.



### 6.3 Factory setting

The factory settings for the Pallas chargers are:

jumper or potentiometer	setting	description
S1	pins 2 & 3	no temperature sensor
S3	placed	no traction battery
S4	placed	no traction battery
S5	removed	50 Hz
S6	removed	no continuous float mode
R82	25	current limit adjustment
R83	13.5V	float voltage adjustment
R84	14.25V	boost voltage adjustment

### 6.4 Jumpers

Jumpers are small removable connectors situated on the PCB. By placing and removing the jumpers various features can be enabled or disabled.

Illustration 9 shows how to set the jumpers.

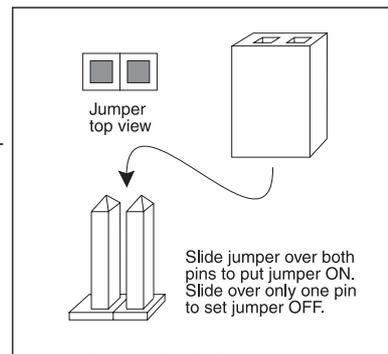


Illustration 9. Jumper placement.

### 6.5 Potentiometers

Potentiometers are adjustable resistors. Turning the screw increases or reduces the values associated within the potentiometer.

These values may concern matters such as voltage, frequency or switch on sensitivity. The screw must be turned by means of a screwdriver (No. 0) and sealed with nail polish. See also illustration 10.

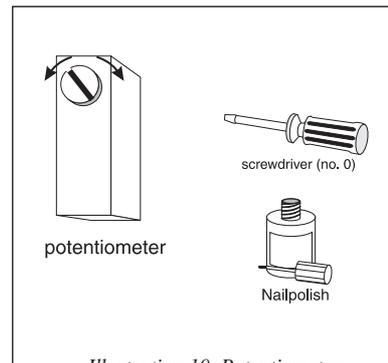


Illustration 10. Potentiometers.



## 7. FAULT FINDING

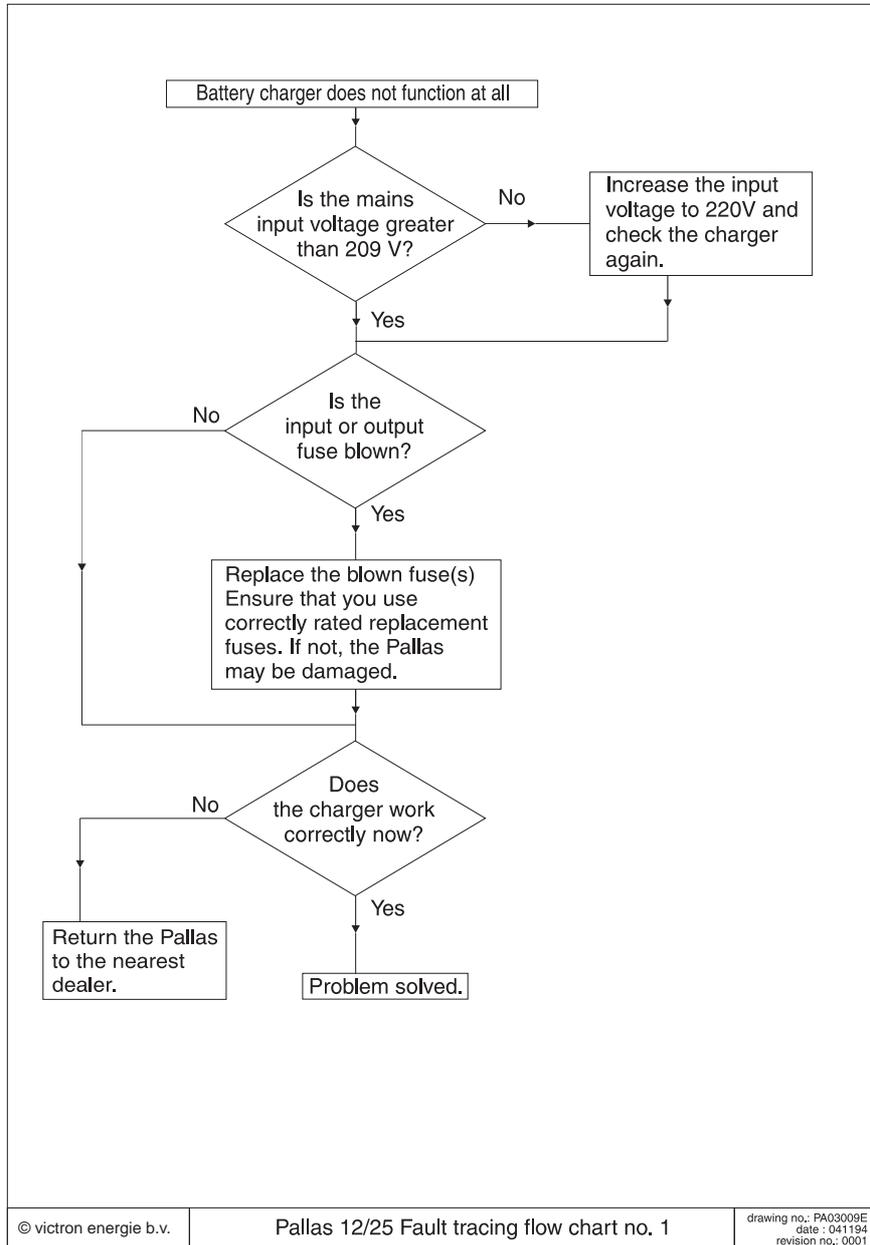
### 7.1 Fault finding

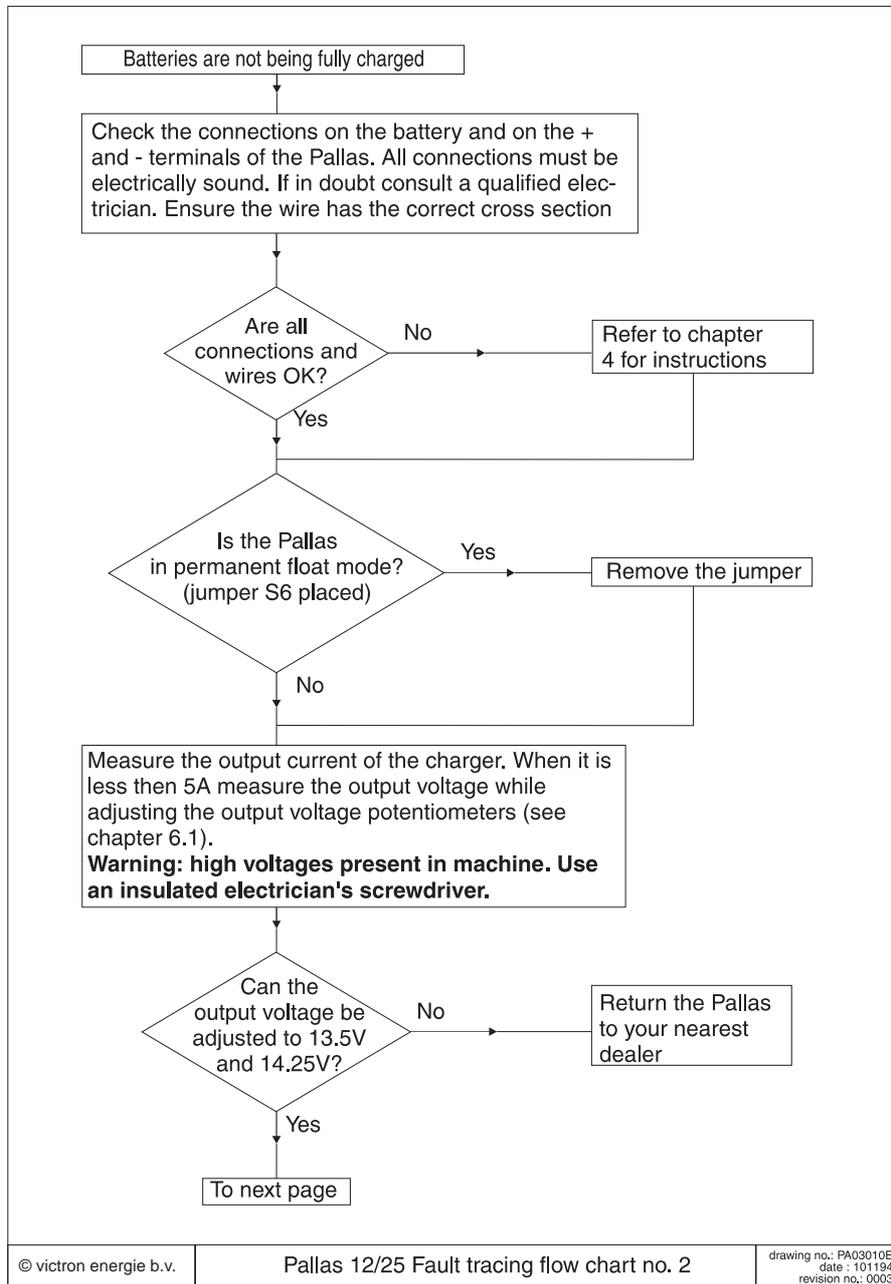
The following 3 diagrams are included to assist you in finding the fault. Experience has shown that most faults can be solved with this procedure. Before checking the Pallas charger, remove all loads from the charger, and connect the unit to mains supply.

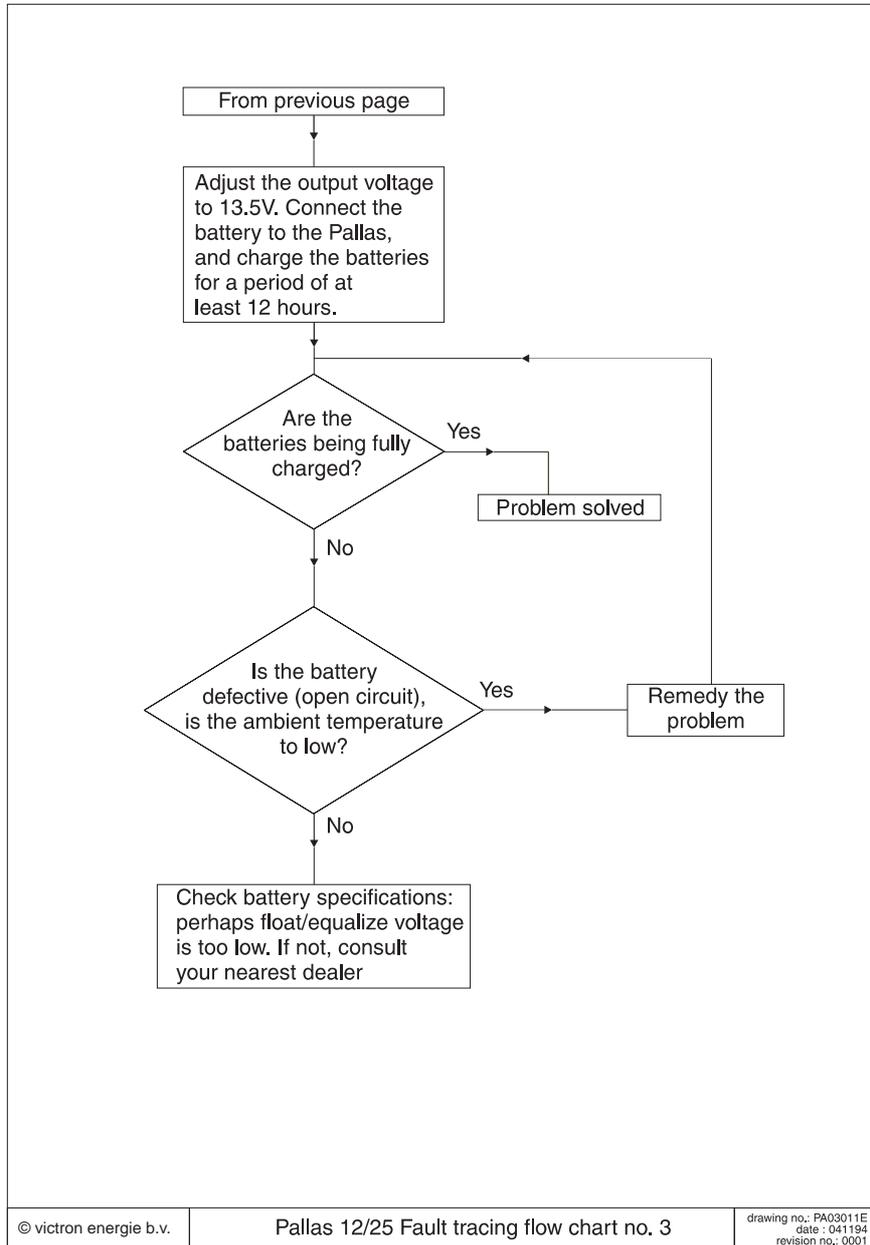
The following conditions are covered by the diagrams:

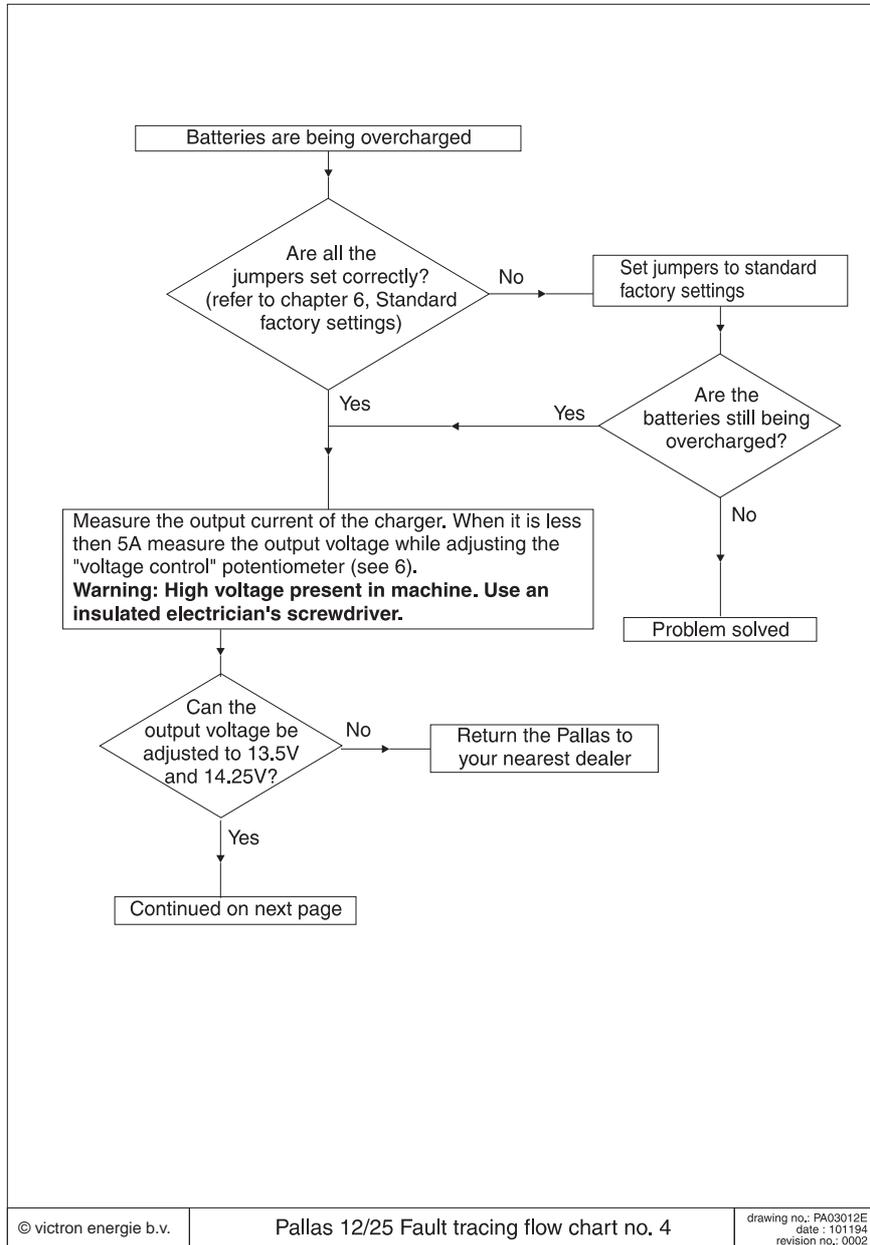
- battery charger does not function at all
- batteries are not being fully charged
- batteries are being overcharged







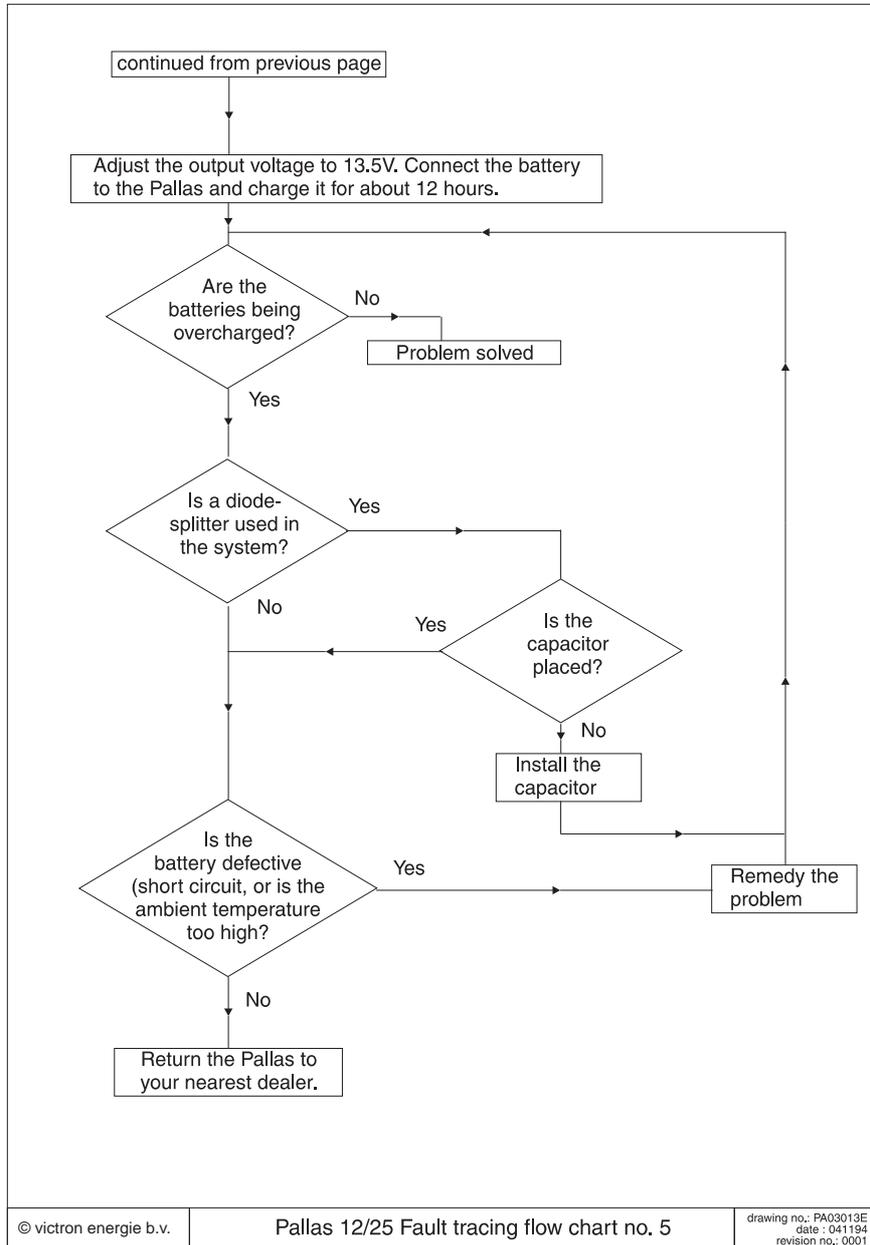




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Pallas 12/25 Fault tracing flow chart no. 4

drawing no.: PA03012E  
date : 101194  
revision no.: 0002



## 8. SPECIFICATIONS



### 8.1 Input



Input voltage:	230V
Frequency range:	47 - 63Hz
Input fuse (230 V):	1 x 10A T 6,3 x 32 mm
Power factor:	0.71 at full load 0.58 at half load
Input current:	3.23A at 230V input on full load

### 8.2 Output



Nominal charging voltage:	12V
High charging voltage (equalize):	14.25V
High charging voltage range:	13.45 - 14.75 V
Low charging voltage (float):	13.5V
Low charging voltage range:	8 - 14.75V
Charging characteristic:	I <sub>Uo</sub> U <sub>o</sub> in accordance with DIN 41772
Voltage stability:	1%
Voltage compensation traction battery	+0.6V through jumper
Output current:	25A
Output current ripple:	70% rms at full load
Output current stability:	+/- 5 %
Short circuit protection:	Continuous short circuit proof

All specifications are subject to change without notice



### 8.3 General

EMC:	
Electro magnetic compatability according Council Directive 89/336 EEC	
Emission	EN 55014 (1993) EN 60555-2 (1986)
Immunity	EN 50082-1 (1991)



### 8.4 Environment

Temperature range:	-10 to 50°C. The charge current de- creases if the temperature rises above 40°C
Cooling:	convection cooling



### 8.5 Mechanical

Noiselevel:	< 40 dB(A)
Case:	Aluminum IP20
Colour:	Blue (RAL5012) epoxy
Dimensions (h x b x d):	280 x 200 x 180 mm
Weight:	10 kg

### 8.6 Connections

Output 12 V <sub>DC</sub> :	M8 bolts
Input 230 V <sub>AC</sub> plus earth:	3 pole mains wire plus extra earth terminal on housing



## **9. DRAWINGS**

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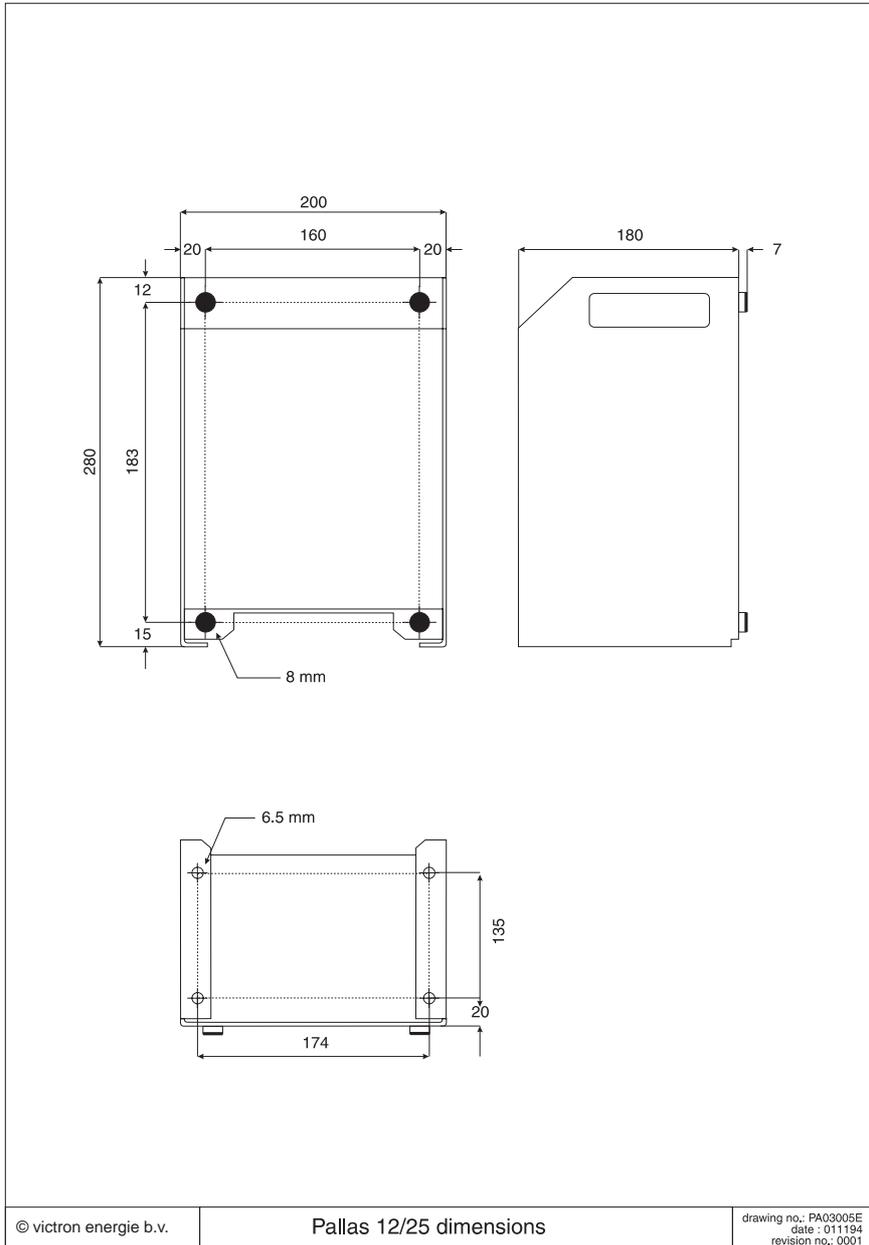
**Victron Pallas charger dimensions**

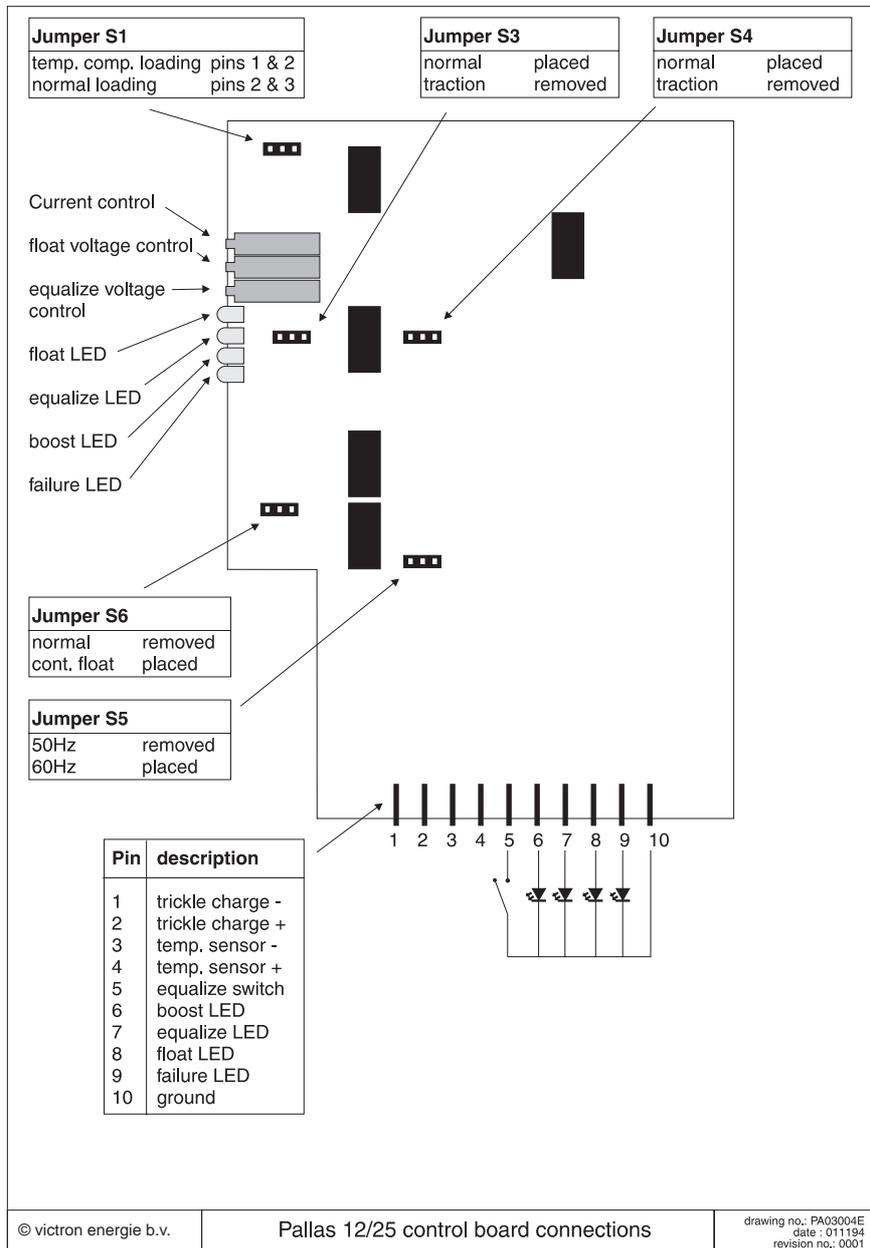
**32**

**Victron Pallas charger connections**

**33**







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