MPPT- Windpower charge controller windMax1500

Description:

This windpower charger in processor technique, contains all functions for smooth charging of lead batteries by windpower generators of 1850W at 24V- and 960W at 12V-battery-systems.
Through powertracking more electrical energy is charged from the wind generator into the battery compared with standard charging systems, depending on the nominal voltage of the wind turbine. The higher the turbine voltage against the battery voltage, the higher the gain.

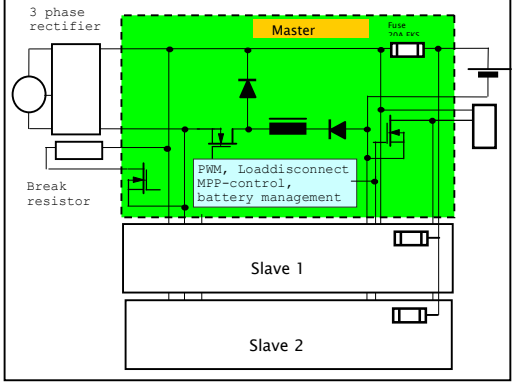
The maximum generator voltage can be 150Vac (Open circuit voltage).
It is a 3phase input. The voltage in the Maximum powerpoint of the windgenerator is transformed to the level of the battery system. (12V/24V/48V).
The topology of the buck converter feeds the maximum possible current from the power maximum into the battery. As soon as the battery is full and reaches its maximum voltage (14.1V/28.2V/56.4V) the charger drives the generator voltage towards open circuit voltage, preventing overcharging of the battery.
For protection of the windgenerator and charge controller it is possible to connect a break resistor to the terminal **DUMPLOAD**
The break resistor is switched on the gnd level via a mosfet at the output of the 3 phase rectifier.
MPPT is activated about every second.

Optional a power curve can be programmed ex works. The Voltage steps are 1V, between 0V and 192V.
Optional a temperature sensor placed near the battery system effects the maximum battery voltage at a rate of -4mV/°C/battery cell.
Optional the device can be equipped with a LCD Display for battery current, battery voltage, power and energy (kilowatt hour meter).
Optionally a RS232 can be added.

Highlights:

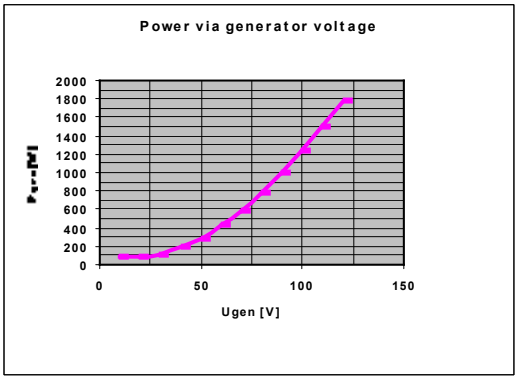
*** DC-Converter to optimize wind power income**
*** MPP-Tracking of wind generator voltage**
*** Selection of 3 battery voltages 12V/24V/48V**
*** Break resistor switching output**
*** Deep discharge protection with shortcut protection**
*** optional power curve programming, instead of mppt**
*** optional dc boost converter for generator voltage.**
*** optional LCD for current, voltage, power, energy (kilowatt hour meter)**

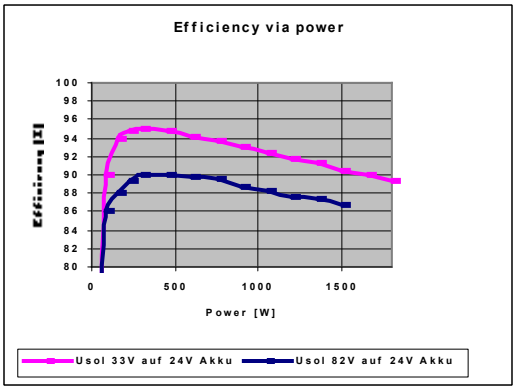
Principal circuit



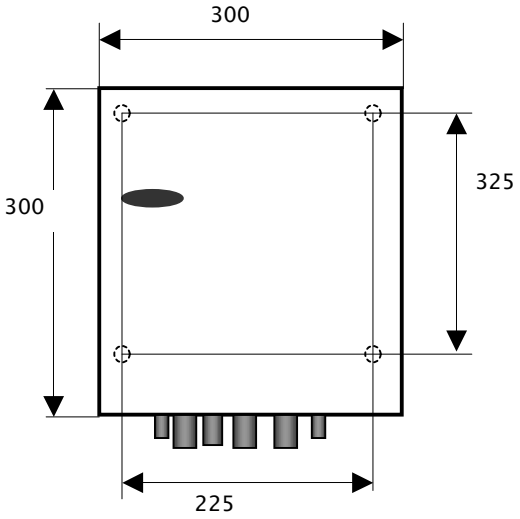
Technical data:

	12V-Battery	24V-Battery	48V-Battery
Max. Generatorvoltage, Ugendc	200Vdc	200Vdc	200Vdc
Max. Generator current	16A	16A	16A
Max. Battery current	60A	60A	37.5A
Max.Generator power, Pgen@Eff.=90%	967W	1851W	2314W
Efficiency	90% @ 0.5Pgen	94% @ 0.5Pgen	94% @ 0.5Pgen
End of charge voltage	14.5V	29.0V	58.0V
Deep discharge protection Load disconnect (short cut protected) Load reconnect Max. consumer current	 10.8V Battery voltage with 60 Sec. Delay 12.5V 37.5A	 21.6V Battery voltage with 60 Sec. delay 25.0V 37.5A	 43.2V Battery voltage with 60 Sec. delay 50.0V 37.5A
Break resistor dis-/reconnect	160Vdc/150Vdc	160Vdc/150Vdc	160Vdc/150Vdc
Current consumption	13mA	13mA	13mA
Terminals 3x wind generator 2x battery output 2x consumer outp. 2x temp. sensor 2x pot.free contacts 2x DUMPLOAD 1x Earth	16qmm/10qmm, 16qmm/10qmm, 16qmm/10qmm, 1qmm, 1qmm, 4qmm/2.5qmm, M6		
Temperature sensor	KTY10-5 or 1.91kOhm		
LEDs	right: yellow (max. battery voltage) left: green (battery current>1.5A) middle: red (load disconnected)		
Housing	Steel wall mounted wxhxd 300x400x150mm		
protection	IP55 with ventilation		
weight	15kg		
Moisture	90%		
Operating temperature	-20°C to +50°C		



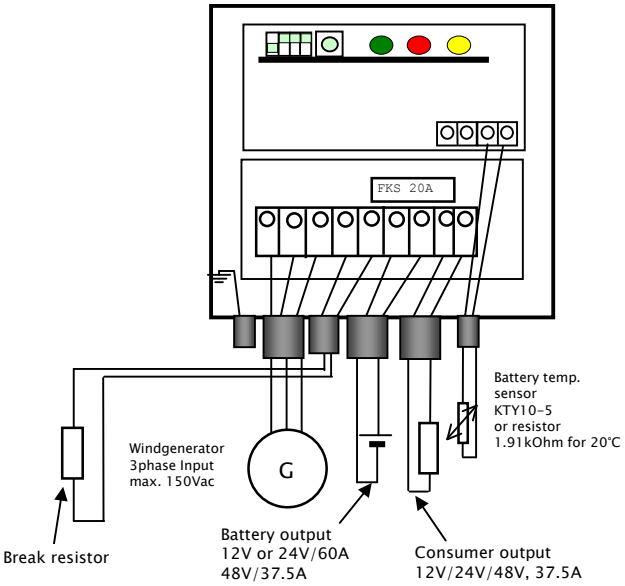


Housing dimensions (mm):



Height=150mm
Mounting holes in bottom of housing
D=10mm

connection diagram



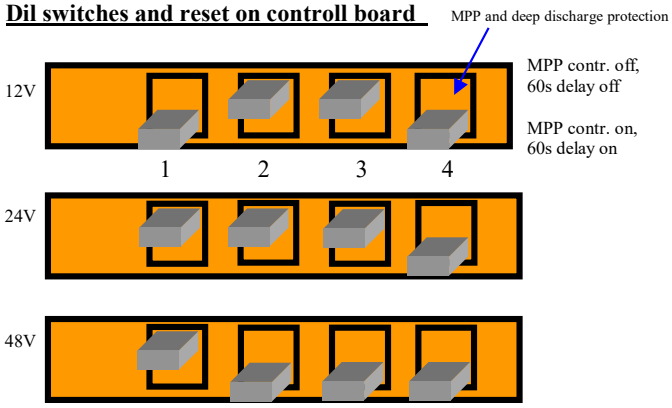
Basic calculations:

The maximum admissible input voltage of the charge controller is determined by the rectified AC-Voltage of the three phase generator. Depending on star or delta connection, the dc-voltage is different.

At a star connection the maximum generator dc-voltage is:
Ugendc=1.35*Urs or 1.35*Ust or 1.35*Urt
Urs=1.73*Ustring

At a delta connection the maximum generator dc-voltage is:
Ugendc=1.35*Urs

Dil switches and reset on controll board



By pressing the **reset switch** and having **switched off the MPP control** you can adjust manually to the MPP of the wind generator.

Connection of break resistor

The break resistor must be connected to the terminal **DUMPLOAD**.
It's purpose is to remove electrical energy from the windgenerator when the battery is full and if the windpower is too large.
As soon as a generator dc- voltage **(Ugendc)** more than 150Vdc is at the charge controller, the break resistor is switched on.

Recommended dimensioning:

Resistor value: R=150Vx150V/Pgen
Resistor power: P=150Vx150V/R

Example: Pgen=1870W

R=150x150/1870=12.03Ohm => **12Ohm**
P=150x150/12=**1875W**