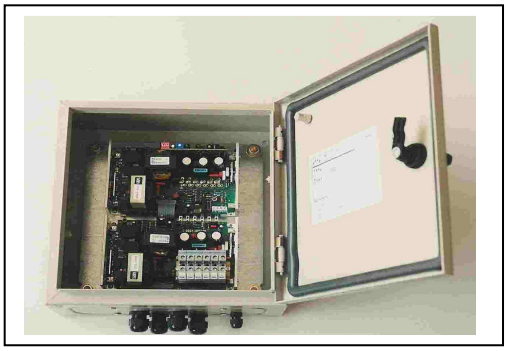
# MPP- Windpower charge controller windMax1000

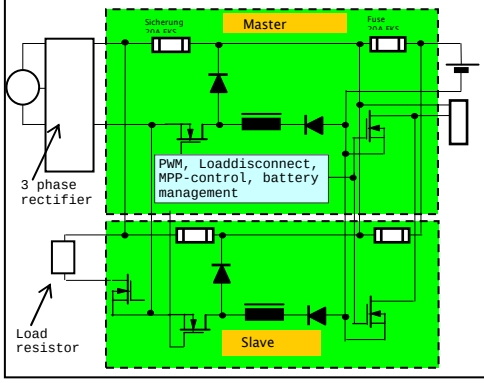
## Description:

This windpower charger in processor technique, contains all functions for smooth charging of lead batterys by windpower generators of 1120W at 24V- and 560W at 12V-battery-systems.
Because of the powertracking it is possible to increase the charged electrical power from the wind generator into the battery up to 200%, compared with standart charging systems. This is achieved through controlled adaptation (1x per Second) of windgenerator and battery system.
The maximum generator dc-voltage can be 200V, for a 12V-system as well as for a 24V-system and 48V-System. (Open circuit voltage)
The controller input is a 3phase current 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 load resistor to the terminal **Rload**.
The load resistor is connected via a mosfet between +/- of the rectified generator voltage.
An optional temperature sensor at the batterysystem effects the maximum batteryvoltage at a rate of -4mV/°C/battery cell.
LED's indicate the battery state. Battery management allows optimal use of the battery capacity



**Highlights:**
*** DC-Converter to optimize wind power income**
*** MPP-Tracking of wind generator voltage**
*** Selection of 3 battery voltages 12V/24V/48V**
*** Load resistor terminal**
*** Deep discharge protection**
*** Temperature tracking of battery voltage**
*** Battery management System**
*** Option: LCD for Battery voltage, -current, power**

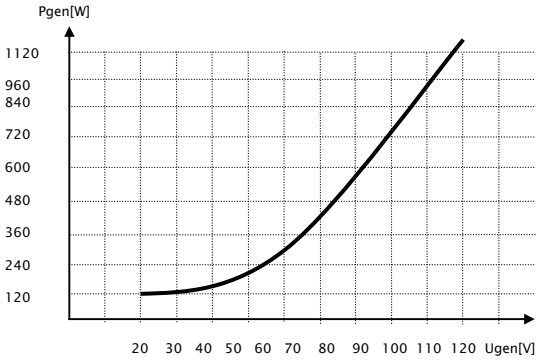
### Principal circuit diagram



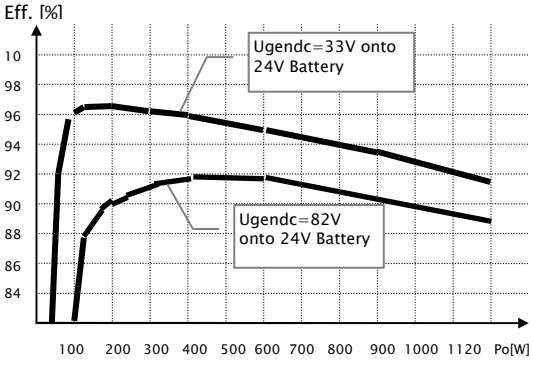

## Technical data

| | 12V-Battery | 24V-Battery | 48V-Battery |
|---|---|---|---|
| Max. Generatorvoltage, Ugendc | 200Vdc | 200Vdc | 200Vdc |
| Max. Generator current | 16A | 16A | 16A |
| Max. Battery current | 40A | 40A | 25A |
| Max.Generator power, Pgen@Eff.=90% | 620W | 1240W | 1550W |
| Efficiency | 93% @ 0.5Pgen | 96% @ 0.5Pgen | 96% @ 0.5Pgen |
| End of charge voltage | 14.5V | 29.0V | 58.0V |
| Deep discharge protection<br>Load disconnect<br>Load reconnect | 10.8V Battery voltage with 60 Sec. delay<br>12.5V | 21.6V Battery voltage with 60 Sec. delay<br>25.0V | 43.2V Battery voltage with 60 Sec. delay<br>50.0V |
| Load resistor dis-/reconnect | 150Vdc/80Vdc | 150Vdc/80Vdc | 150Vdc/80Vdc |
| Current consumption | 7mA | 7mA | 7mA |
| Terminals<br>3x wind generator<br>2x battery output<br>2x consumer outp.<br>2x temp. sensor<br>2x pot.free contacts<br>2x Rload | 16qmm/10qmm,<br>16qmm/10qmm,<br>16qmm/10qmm,<br>1.5qmm,<br>1.5qmm,<br>4qmm/2.5qmm, | | |
| Temperature sensor | KTY10-5 or 1.91kOhm | | |
| LEDs | right: yellow (max. battery voltage)<br>left: green (battery current>0.5A)<br>middle: red (load disconnected) | | |
| Housing | Steel wall mounted wxhxd 300x300x150mm | | |
| protection | IP65 | | |
| weight | 11kg | | |
| Moisture | 90% (coating) | | |
| Operating temperature | -20°C to +50°C | | |

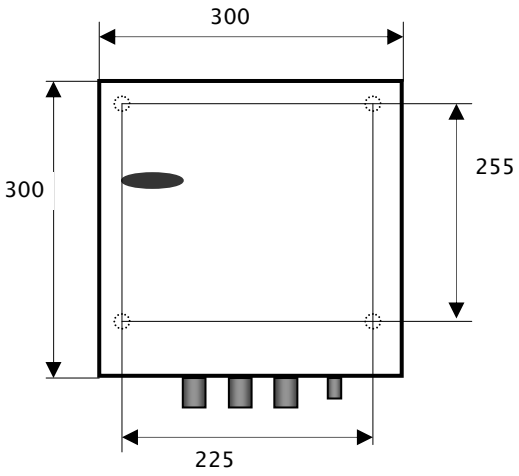
### expected generator power (battery side, 24V)




### Efficiency vs power

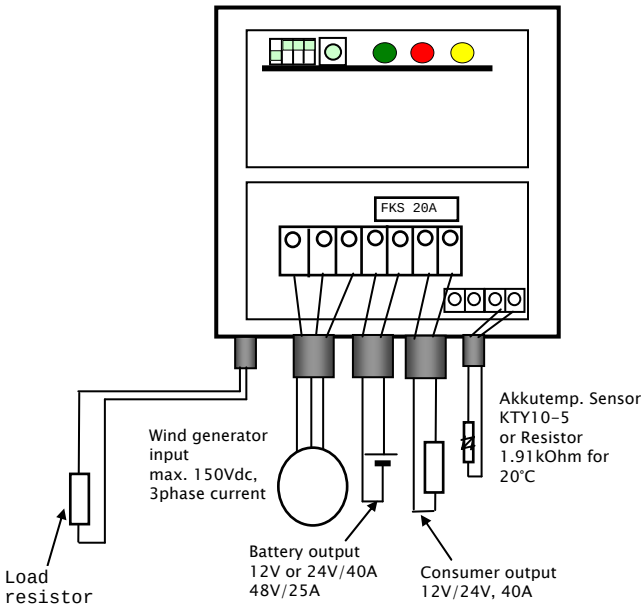


## Housing dimensions (mm):




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

## connection diagram



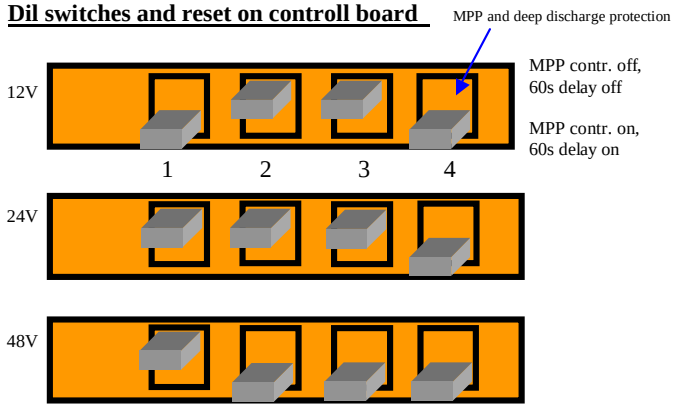

## Basic calculations:

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 contro**l you can adjust manually to the MPP of the wind generator.

## Connection of load resistor

The load resistor must be connected to the terminal Rload.
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 150V is at the charge controller, the load resistor is switched on.

Recommended dimensioning:

Resistor value: Rload=150Vx150V/Pgen
Resistor power: Pload=150Vx150V/Rload

Example: Pgen=1240W

Rload=150x150/1240=18.15Ohm => **18Ohm**
Pload=150x150/22=**1250W**