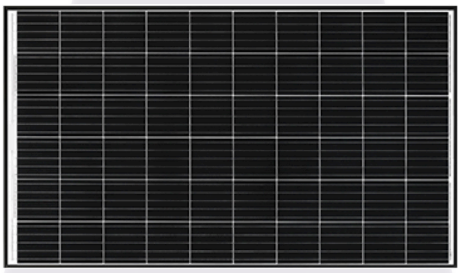
photovoltaic system

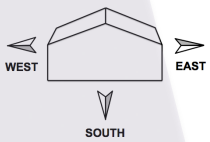
the sun has excess of energy and sends no bills because we use it

solar cell technology works by the photovoltaic effect
that converts part of the received light energy into electrical energy

the optimal place of a photovoltaic system in connection with private homes
is low inclination (18° to 30°) east / west facing orientation and additionally vertical south



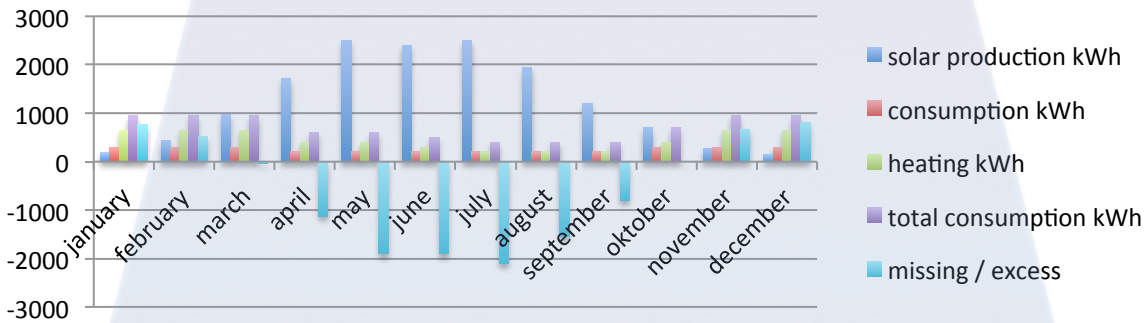
SONNENSTROM FABRIK



specification
solar module

- type mono crystalline 108 half-cut cells
- model SAPPHIRE glass/foil
- max. effect 395-405 watt peak STC
- laminated with 3,2 mm tempered glass
- measurement dxwxh : 3,5x114x175 cm
- frame 35 mm black anodized aluminium
- black appearance
- weight : 22 kg
- design load snow : 5.400 Pa
- operation temperature : -40° til 85°
- designed for outdoor use - IP65
- 26 year linear performance warranty (87%)
- 25 year product warranty
- produced in Germany by a supplier with 25 years of experience

- estimated electricity production is 880 kWh / kWp in Denmark with roof pitch 20° east / west orientation at a solar radiation of 1,045 kWh / m²
- estimated electricity production is 750 kWh / kWp in Denmark with vertical 90° south orientation at a solar radiation of 1,045 kWh / m²
- an off-grid coupled photovoltaic system is always planned larger than necessary with a safety factor to ensure that enough energy will be available throughout the year
- below is an annual overview for a 18 kWp plant with 4 months without 100% self-sufficiency



the quality is not better than the weakest part of the system

nickel ion battery system

storage of three-phase power from photovoltaics
as a stand-alone / off-grid system that cannot be hacked

victron energy
BLUE POWER

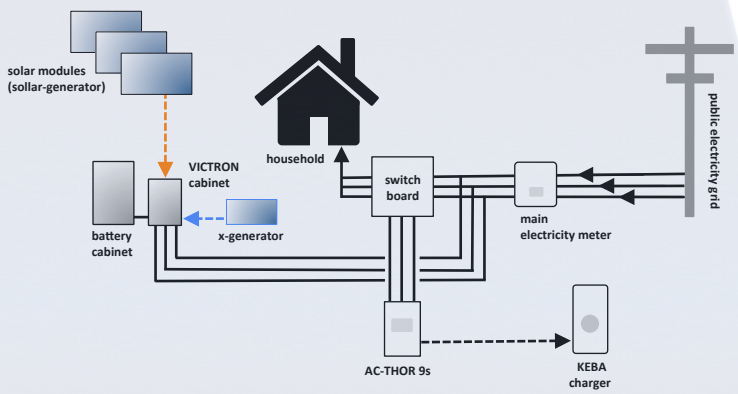
specification
VICTRON system

- three-phase combi inverter
- 3 units MultiPlus II 3000 / 5000 VA
- charge controllers RS 450 VDC
- steel cabinet EMF shielded
- measurment wxdxdh: 62x62x142 cm
- weight 110 kg
- efficiency 96%
- incl. monitoring via VRM portal
- with alternative generator input
- operation temperature -5°C to 45°C
- IP52 - should be installed a shielded place
- off-grid function 7 kW or 12 kW
- all-in-one unit incl. all necessary switches/fuses
- 5 year product warranty from a supplier with 40 years experience

ADS®

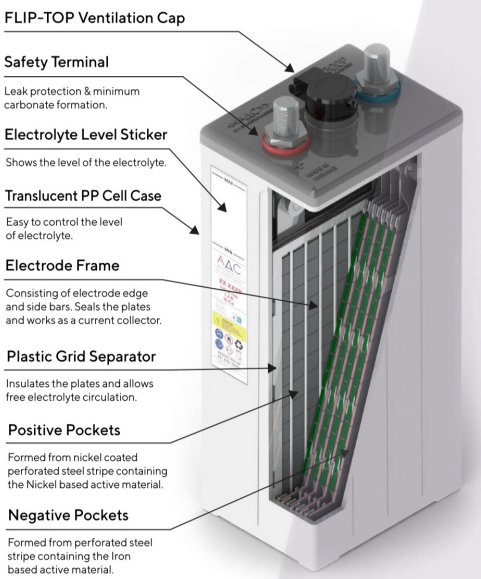
specification
NiFe battery

- Nickel Ion NiFe battery
- no hazardous chemistry - no BMS system
- a truly environmentally friendly battery solution
- steel cabinet ventilated
- dimensions wxdxh 102/122/162x62x122 cm
- weight 520, 700 og 950 kg
- usable energy 12 kWh, 19 kWh or 27 kWh (C5)
- low voltage - rated voltage 48 V
- incl. automatic watering system
- operating temperature -40° C to 60° C
- IP52 - should be installed a shielded place
- must be serviced once a year
- product life up to 40 years
- 3 year product warranty
- produced from recycled nickel in Ukraine



the quality is not better than the weakest part of the system

NiFe / nickel ion batteries



what is a nickel ion battery ?

invented over 100 years ago by Thomas Edison, as an environmentally friendly alternative to rechargeable lead-free batteries without heavy metals
they are now again being produced several places in the world after lead acid battery companies closed Edison's factory in 1972

nickel iron batteries are reliable and have a design life of 30-40 years
there are NiFe batteries that still work after 80 years and they are still one of the most environmentally friendly battery available

they have low operating costs, low self-discharge, long cycling life and are environmentally friendly
they can withstand deep discharge, large temperature variations, mechanical and electrical abuse, and still with excellent and reliable performance over a long period, and with a working temperature range of -40° C to 60° C

advantages

more amperes / energy can be squeezed out of a nickel iron battery, and still maintain a long life compared to other battery types

more Ah ampere hours = *more available power*
Ah capacity is stated as C5 (5 hours constant discharge at 25º C to 1.0 V per cell)

no memory effect
as there is no memory effect, the battery can be used for everyday cycles where there is daily charging and recharging

no acid - simple green technology
there is no danger from battery acid / electrolyte thanks to a proven green technology - no other battery on the market has the same lifespan as a NiFe battery

minimum maintenance
when the battery is charging quickly it will be necessary to add distilled water – automatic watering system is used - ventilation is necessary for the discharge of hydrogen, which is formed in very small quantities

the NiFe battery does not freeze
as Ni-Fe batteries do not freeze, they are suitable for uninhabited cabins / boats or motorhomes during the cold winter months

It is possible to add more batteries later
multiple batteries can be added at any time, so if you want to add to an existing system, this is possible for example, if you have a 500 Ah system an 800 Ah system can easily be added

withstands full discharge
NiFe batteries can be fully discharged (Depth of Discharge) without causing damage or reducing battery life

replacement of a battery cell at any time
if you have a defective battery cell this can be replaced with a new one even years later

electrolyte
the electrolyte is alkaline in the form of a mixture of KOH and LiOH (potassium hydroxide and alkali metal hydroxide)

lower weight compared to lead acid batteries
nickel is lighter than lead, and thus NiFe batteries are significantly lighter