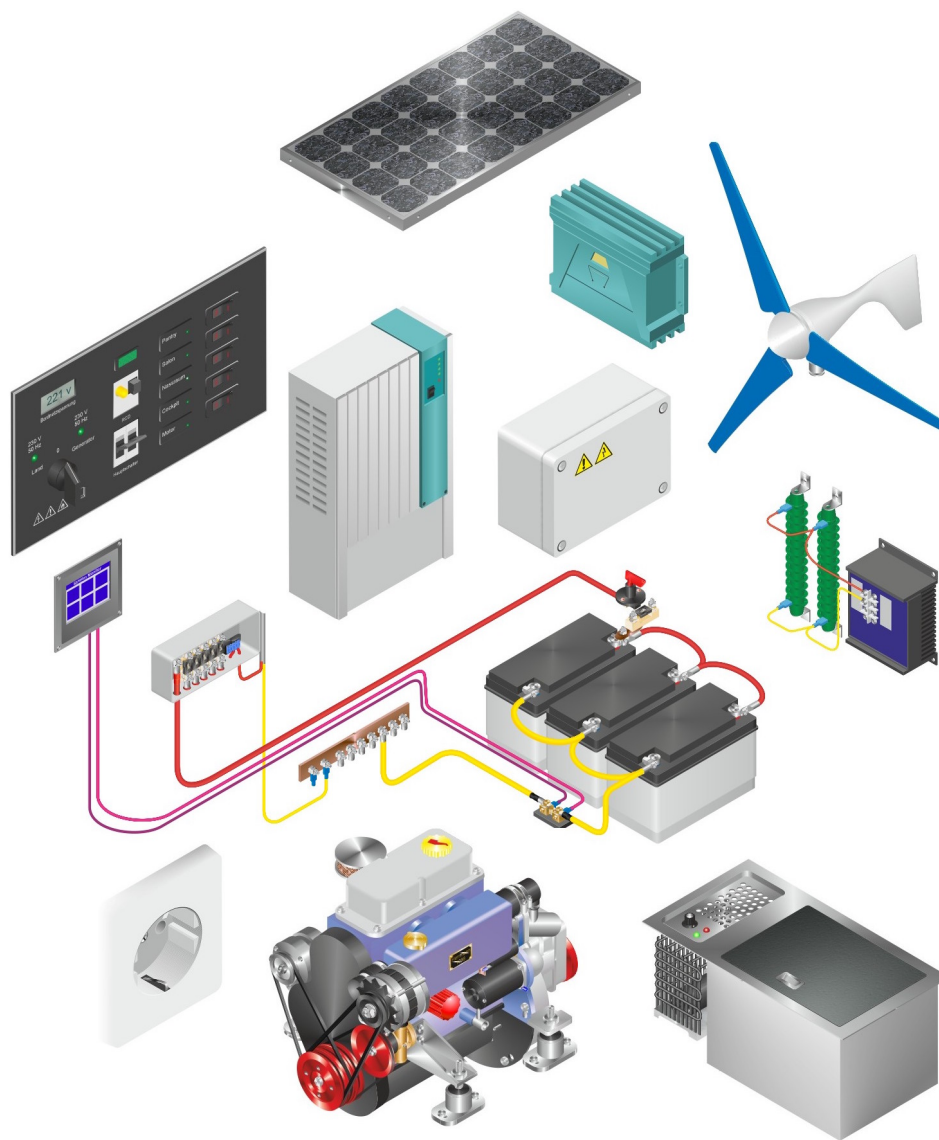


Your independent power supply



Refrigerator, microwave, water maker, autopilot, George Clooney for breakfast, computer, camera, light, hair dryer and this, if possible for a few days without running the engine!?

Desires in our independent power supply is big, the possibilities, physically, through weight, space and financially limited. As soon as no shore power is available, we are responsible for production, storage and control of your energy.



This paper is intended to provide some basic information, stimulate thinking and give a few important points which are essential for the design / adjustment of any independent power supply system.

The service / house batteries are the heart of every independent power supply. They are small chemical power plants and must be treated and monitored accordingly. Like every car have a fuel gauge, every power supply should have a battery monitor. Which tells you the state of charge as well as the actual consumption or charge.

Did you know that...

- a battery should not be discharged more than 50% of its capacity to perform a optimal life time?
- the state of charge of a battery can not be measured by voltage reading (just if battery is not charged or discharged for 4hours)
- therefore a battery management is essential to have state of charge available and beside charge and discharge can be seen and therefor functionality of equipment can be better controlled.
- a battery should be fully charged at least once a month, otherwise sulfation starts?
- it needs 3-4 hours to charge the last 10-15% to a 100% fully charged battery?
- a charger, solar charger or alternator with smart regulator without temperature compensation over charge your batteries if the temperature of the battery is over 20°C / 68°F* or under charge them if temperature is blow 20°C / 68°F*? *(standard temp. depend on manufacturer)
- a standard engine alternator never fully charge your batteries, as they don't have a 3 step charge curve. They are set to around 13.8 to 14V constant voltage, but a battery needs 14.4V (at 20°C / 68°F*) to get fully charged.
- battery life halved by every 10°C / 50°F temperature increase higher than 25°C / 77°F, and therefor battery temperature is very important?
- therefor batteries should not be mounted close together as cooling is not sufficient while charging / discharging with high currents?
- most solar systems loose up to 20% of its available power on its way to the batteries, as wiring is to small or the regulator does not have power point tracking functionality?

WireSizer		
Voltage	Amps / Watts	Circuit Len
10 VDC	13A/156W	11.0 M
11 VDC	14A/168W	11.5 M
12 VDC	15A/180W	12.0 M
13 VDC	16A/192W	12.5 M
14 VDC	17A/204W	13.0 M
Minimum Wire Gauge for Selected Voltage Drop		
1% VD: 2 AWG or 35.0 MM		
2% VD: 4 AWG or 16.0 MM		
3% VD: 6 AWG or 10.0 MM		
4% VD: 8 AWG or 10.0 MM		
5% VD: 8 AWG or 6.0 MM		

- many solar systems contains different solar panels which are wired together to one solar charge regulator and therefore the solar charger can not perform optimally, as well as shading can influence optimum power point tracking function.
- corrosion cause in my experience 75% of all the electrical and electronical problems on board, if the system is well designed.
- this are just the most important points ;-)

Therefore, it becomes clear that a independent power supply needs quite a bit of knowledge to perform as good as possible. Compromises are reality, but if you are aware of this advanced basics, you can better control your compromise / do the right one.

You see, to assemble just a few solar panels will not make you happy in the long term (except there are many of them ☺)

As in power generation, storage and control various components have to play together and each of us have different requirements and budgets, there is no standard solution.

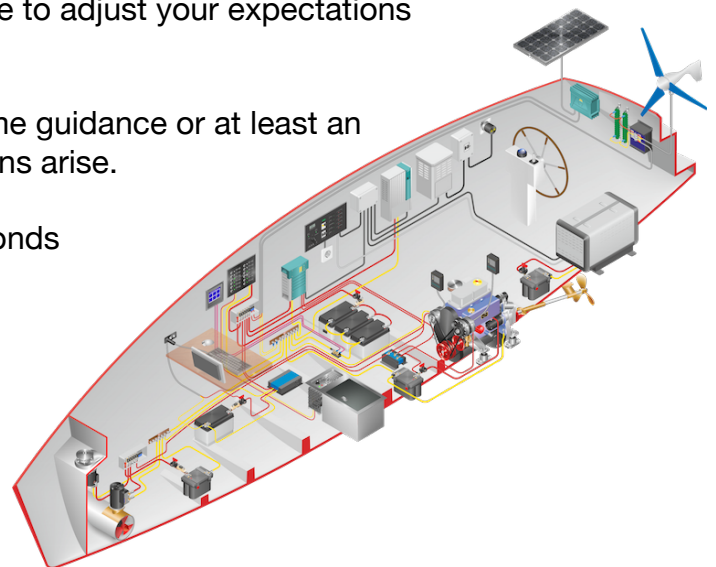
That's why I believe just buying this and than to extend a power system don't make sense.

My intention is to ensure that you get a power supply which meet your needs and is dimensioned for them. It could easily be that you have to adjust your expectations by physical or financial circumstances.

“Do it your self” is possible, but I believe it needs some guidance or at least an available support technician who can help if questions arise.

Finally however, you will get a system which corresponds with your expectations (incl. compromises).

Therefore y-tronics.com offers a world wide support. Today's communications technology offers a wide possibility for support, if it is via email, by phone, video telephony, audio or video messages.



Take advantage of my knowhow, if it's electrics, boatbuilding or daily cruising life.

Contact me without obligation.

Silvio Franceschini



That I get an overview about your wishes and requirements, as well as about what's already on board, I ask you for some information's:

My power supply should be able to:

- Which devices do you want to run for how long every day? Please expand the list accordingly (if possible with power specifications like watts and ampere)



Devices on Board	pieces	Running hours a day	Tension in volt	Power in watt	Day consumption in Wh device x watt x hour
Light					
Refrigerator					
Freezer					
Camera / Mobile					
Water pump					
Radio / TV					
Navigation					
Autopilot					
Computer					
Fans					

- How many days do you want to be independent / without engine / without shore power?

- Which charging options do you have / do you want to use?

engine solar wind shore power _____

- How much space is available for solar panels? How is the surface condition?

- What kind of chargers are installed (power & type, temp. sensor)?

- How is the charging over the engine graduated?

- What size have the actual battery bank? (Ah and may dimensions)?

- Is there a battery management system installed?

- How much space is available for new installations / extensions?

- How much do you want - can you invest?