	input	result
Customer:	TEST	
Periode of use:	seasonal Apr. To Oct. - worst case: October	
Location:	Memmingen, Germany	

1

system cost		~ 2200 $
battery cost per kWh	190,0 $	0,19 $/Wh
module cost per W	2,0 $	2,0 $/W
controller cost per A	2,0 $	0,1 $/W

Voltage	24 V

2

Consumer Profil Fridge							
reefer cargo	water	3 l	glas	0,5 kg	oil	0 l
temperature	ambient	35 °C	inside	-10 °C		
exchange frequency	1	time per day				
time for exchange	00:05					

3

Load Profil **4**

Loads	quantity	consum	unit	operating time	days per week	average current	power per day	energy per day	price/$
no cooling	1 Stk.	0,00	Wh/d	24:00:00	7 d	0,00 A	0,00 Ah/d	0,00 Wh/d	~ 0 $
Load 2	1 Stk.	250,000	W	6:00:00	5 d	1,86 A	44,64 Ah/d	1071,43 Wh/d	
Load 3	1 Stk.	20,000	Wh/d	12:00:00	7 d	0,03 A	0,83 Ah/d	20,00 Wh/d	
Load 4	1 Stk.	2,000	A	8:00:00	2 d	0,19 A	4,57 Ah/d	109,71 Wh/d	
Load 5									
Load 6									
Inverter									
Charge controller	1 Stk.	8,000	mA	24:00:00	7 d	0,01 A	0,19 Ah/d	4,61 Wh/d	~ 50 $
Total:						2,09 A	50,24 Ah/d	1205,75 Wh/d	50,00 $

Reqirement Solar Generator	Module	758 W	if 2 $ / Watt approx. 1520 $
	Radiation		2,08 kWh/m²/d
	battery efficiency		90%
	abberation from MPP		15%
	MPP-current		23,39 A
	needed module power		757,76 Wp

5

Reqirement Battery	Capacity		144 Ah	if 190 $/kWh approx. 650 $
	autonomy period			2 d
	DOD			70%
	needed capacity			143,54 Ah

6

Final System Decision by Installer	module power	capacity	η battery	MPP abberation	DOD
	480,00 Wp	530,00 Ah	85%	15%	70%
	3,48 kWh/m²/d	If the radiation is around 3,48 kWh/m²/d the system can support 1206 Wh/d			
	7,38 d	autonomy periode operating time without radiation			
	0,30 kWh/m²/d	If the radiation is around 0,3 kWh/m²/d			
	7,50 d	the running time is 7,5 days			
	14,81 A	Max. module current			

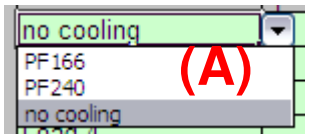
7

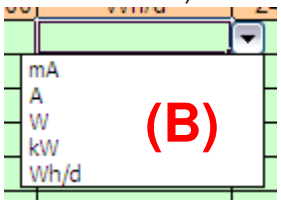
1 => Here the customer, location of the system and season of use can be noted.
When the system is to be used the whole year, this could e.g. say „Whole year – worst month: October“

2 => Here the system voltage can be set: 12, 24 or 48 [V]

3 => Interesting only if the solar fridges PF 166/240 are to be used. A usage profile can be implemented into the calculation, where „exchange frequency“ means that the complete content of the fridge is exchanged x-times a day (which takes y minutes).
Recommendation: Leave these values unchanged, except maybe (if needed) the temperatures.

4 ⇒This field is used for the overall load profile. It is possible to choose if a fridge should be used or not (A).
Other loads can be described using several unit types: (B) and (C)
Important: operating time should be put in as decimal* -> for 6hours that would be 6h / 24 = 0,25
*(but typing 06:00:00 also works)





no cooling	1 Stk.	0,00	Wh/d	24:00:00	7 d
Load 2	1 Stk.	500,000	W	6:00:00	5 d
Load 3	1 Stk.	20,000	Wh/d	12:00:00	7 d
Load 4	1 Stk.	2,000	A	8:00:00	2 d

(C)

5 => Displays calculated recommended module power depending on the locations‘ irradiation. The smallest irradiation values for the given location over the operating time/period should be chosen.
Sources for irradiation data: PVGis (Europe & Africa), Solar Electricity Handbook (worldwide, chosen locations), SoDa (NASA…)
MPP aberration and battery efficiency can stay unchanged.

6 => Calculated recommended battery capacity is displayed here. DOD 70% means that the battery will have a capacity of 30% left. This value should be set according to the manufacturers recommendation regarding discharge.
Autonomy time can be set according to the needs.

7 => If e.g. the batteries are already bought, here the system performance with given values can be checked.
The information on currents and voltages can be used to decide on the charge controller.