1 Parameters for ...

This Section contains the parameters for ... together with explanations and sources This Section should be removed, as soon everyone is familiar with the layout.

1.1 Group your parameters intelligent

Example_parameter1=	1234	[5]	Short Description of parameter 1
Example_parameter2=	1234	[5]	Short Description of parameter 2
Example_parameter3=	1234	[5]	Short Description of parameter 3 If your description gets very long, use the thead command and then you can add line wrapping. Automatic line wrapping is theoretically possible, but I couldn't make it run.

2 Parameters for Panel(Heat)

This Section contains the parameters for the heat side of the panel together with explanations and sources

2.1 densities of the panel parts

rho_Glass=	3000	[3]	Density of the Glass covering the Panel [kg/m^3]
rho_PVcells=	2330	[3]	Density of the Photovoltaik cells [kg m^{-3}]
rho_EVA=	960	[3]	Density of the ethylene vinyl acetate (EVA) layer [kg/m^3]
rho_Backsheet=	2700	[3]	Density of the Metal back sheet [kg/m^3]

2.2 Thicknesses of the panel parts

thickness_Glass=	0.003	[3]	Thickness of the Glass covering the Panel[m]
thickness_PVcells=	0.00022	[3]	Thickness of the Photovoltaik cells[m]
thickness_EVA=	0.00050	[3]	Thickness of the ethylene vinyl acetate (EVA) layer[m]
thickness_Backsheet=	0.00001	[3]	Thickness of the Metal back sheet[m]

2.3 Heat capacities for the panel

c_Glass=	500	[3]	Specific Heat capacity of the Glass covering [J/(kg*K)]
c_PVcells=	677	[3]	Specific Heat capacity of the PV cells [J kg^{-1} K^{-1}]
c_EVA=	2090	[3]	Specific Heat capacity of the ethylene vinyl acetate (EVA) layer [J kg^{-1} K^{-1}]
c_Backsheet=	900	[3]	Specific Heat capacity of the Glass covering [J/(kg K)]

2.4 Heat transfer to the outside and influence of wind

Usually the heat transfer is expressed as a U-Value. In this model, the influence of the wind is regarded as well. That means, the convective heat transfer coefficient needs to be used instead.
The convective heat transfer coefficient is given as:
$hw = 5.7 + 3.8 * windSpeed$ [2]
This means U_PA = hw

2.5 Panel efficiency

eta_PV=	0.139	[4]	Electric efficiency of the Panel

2.6 Panel dimensions

l_collector=	1.652	[4]	Total length [m]
b_collector=	1.000	[4]	Total width [m]

2.7 Tubing parameters

A_PW=	1.46	[4]	Heat absorption area for the water[m^2]
U_PW=	237	[1]	heat transfer coefficient Panel/water [$W/(m^2\,K)$]

References

[1] *Engineering ToolBox*. 2001. URL: https://www.engineeringtoolbox.com.

[2] S. Khandelwal, K. S. Reddy, and S. Srinivasa Murthy. "Performance of contact and non-contact type hybrid photovoltaic-thermal (PV-T) collectors". In: *International Journal of Low-Carbon Technologies* 2.4 (2007), pp. 359–375. DOI: 10.1093/ijlct/2.4.359. eprint: /oup/backfile/content_public/journal/ijlct/2/4/10.1093/ijlct/2.4.359/2/2-4-359.pdf. URL: http://dx.doi.org/10.1093/ijlct/2.4.359.

[3] Jae-Han Lim, Yoon-Sun Lee, and Yoon-Bok Seong. "Diurnal Thermal Behavior of Photovoltaic Panel with Phase Change Materials under Different Weather Conditions". In: *Energies* 10.12 (2017), p. 1983.

[4] Anaf S.p.A. *Photovoltaic/Thermal Panel H-NRG*. URL: http://www.anafsolar.eu/eng/prodotti_pH_1.html.

[5] Testname. "Testtitle". In: *Testjournal* ().