
Python calculation for heat pump SIN-18TU

Parametric Heat Pump calculation

Dani Carbonell

dani.carbonell@solarenergy.ch

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Table 1: Fitted coefficients for the heat pump.

Coefficient	Description	[kW]
PQ_1	1 st condenser polynomial coefficient	1.6031e+01
PQ_2	2 st condenser polynomial coefficient	1.6862e+02
PQ_3	3 st condenser polynomial coefficient	4.5006e+01
PQ_4	4 st condenser polynomial coefficient	-3.0845e+02
PQ_5	5 st condenser polynomial coefficient	2.7295e+02
PQ_6	6 st condenser polynomial coefficient	-1.9880e+02
$PCOP_1$	1 st COP polynomial coefficient	6.0450e+00
$PCOP_2$	2 st COP polynomial coefficient	5.1596e+01
$PCOP_3$	3 st COP polynomial coefficient	4.8630e-01
$PCOP_4$	4 st COP polynomial coefficient	-1.9286e+02
$PCOP_5$	5 st COP polynomial coefficient	-2.0545e+01
$PCOP_6$	6 st COP polynomial coefficient	-8.4732e+01
\dot{m}_{cond}	3000.00 [kg/h]	
\dot{m}_{evap}	3000.00 [kg/h]	
COP_{nom} (B0W35)	4.68	
$Q_{c,nom}$ (B0W35)	17.54 kW	
COP_{nom} (B2W35)	4.88	
$Q_{c,nom}$ (B2W35)	18.43 kW	
COP_{nom} (B10W35)	5.70	
$Q_{c,nom}$ (B10W35)	22.22 kW	

Table 2: Predicting results of the heat pump.

$T_{evap,in}$ °C	$T_{evap,out}$ °C	$T_{cond,in}$ °C	$T_{cond,out}$ °C	COP [-]	Q_{cond} [kW]	Q_{evap} [kW]	W_{comp} [kW]	\dot{m}_{cond} kg/h	\dot{m}_{evap} kg/h	ΔT_{evap} K	ΔT_{cond} K
-7.00	-10.45	25.86	30.00	4.17	14.45	10.99	3.47	3000	3000	3.5	4.1
-7.00	-10.39	34.54	38.75	3.75	14.72	10.79	3.93	3000	3000	3.4	4.2
-7.00	-10.14	43.32	47.50	3.15	14.61	9.97	4.64	3000	3000	3.1	4.2
-7.00	-9.57	52.21	56.25	2.38	14.12	8.19	5.94	3000	3000	2.6	4.0
-7.00	-8.25	61.19	65.00	1.42	13.31	3.96	9.35	3000	3000	1.2	3.8
-4.00	-7.84	25.50	30.00	4.52	15.70	12.23	3.48	3000	3000	3.8	4.5
-4.00	-7.76	34.20	38.75	4.03	15.88	11.94	3.94	3000	3000	3.8	4.5
-4.00	-7.47	43.01	47.50	3.38	15.68	11.04	4.64	3000	3000	3.5	4.5
-4.00	-6.88	51.92	56.25	2.54	15.11	9.17	5.94	3000	3000	2.9	4.3
-4.00	-5.54	60.93	65.00	1.52	14.22	4.89	9.33	3000	3000	1.5	4.1
-1.00	-5.25	25.13	30.00	4.86	17.01	13.51	3.50	3000	3000	4.2	4.9
-1.00	-5.13	33.85	38.75	4.32	17.10	13.14	3.96	3000	3000	4.1	4.9
-1.00	-4.82	42.68	47.50	3.60	16.82	12.15	4.67	3000	3000	3.8	4.8
-1.00	-4.21	51.62	56.25	2.71	16.16	10.19	5.97	3000	3000	3.2	4.6
-1.00	-2.83	60.65	65.00	1.62	15.19	5.83	9.36	3000	3000	1.8	4.4
2.00	-2.67	24.74	30.00	5.20	18.38	14.84	3.53	3000	3000	4.7	5.3
2.00	-2.52	33.49	38.75	4.60	18.38	14.39	3.99	3000	3000	4.5	5.3
2.00	-2.18	42.34	47.50	3.83	18.02	13.31	4.71	3000	3000	4.2	5.2
2.00	-1.54	51.30	56.25	2.87	17.28	11.25	6.02	3000	3000	3.5	4.9
2.00	-0.14	60.35	65.00	1.72	16.23	6.79	9.43	3000	3000	2.1	4.6
5.00	-0.10	24.33	30.00	5.54	19.80	16.23	3.57	3000	3000	5.1	5.7
5.00	0.07	33.10	38.75	4.88	19.72	15.68	4.04	3000	3000	4.9	5.6
5.00	0.44	41.98	47.50	4.05	19.27	14.51	4.76	3000	3000	4.6	5.5
5.00	1.11	50.97	56.25	3.03	18.45	12.36	6.09	3000	3000	3.9	5.3
5.00	2.55	60.04	65.00	1.82	17.32	7.79	9.54	3000	3000	2.4	5.0
8.00	2.45	23.91	30.00	5.88	21.28	17.66	3.62	3000	3000	5.6	6.1
8.00	2.64	32.70	38.75	5.17	21.12	17.03	4.09	3000	3000	5.4	6.0
8.00	3.04	41.60	47.50	4.27	20.59	15.76	4.82	3000	3000	5.0	5.9
8.00	3.75	50.61	56.25	3.19	19.68	13.51	6.18	3000	3000	4.2	5.6
8.00	5.23	59.71	65.00	1.91	18.48	8.82	9.67	3000	3000	2.8	5.3
11.00	4.98	23.47	30.00	6.22	22.81	19.15	3.67	3000	3000	6.0	6.5
11.00	5.21	32.28	38.75	5.44	22.57	18.43	4.15	3000	3000	5.8	6.5
11.00	5.63	41.21	47.50	4.49	21.96	17.07	4.89	3000	3000	5.4	6.3
11.00	6.38	50.24	56.25	3.34	20.98	14.70	6.27	3000	3000	4.6	6.0
11.00	7.89	59.36	65.00	2.01	19.70	9.88	9.82	3000	3000	3.1	5.6
14.00	7.50	23.01	30.00	6.56	24.41	20.68	3.72	3000	3000	6.5	7.0
14.00	7.75	31.85	38.75	5.72	24.09	19.88	4.21	3000	3000	6.3	6.9
14.00	8.21	40.80	47.50	4.71	23.39	18.42	4.97	3000	3000	5.8	6.7
14.00	8.98	49.85	56.25	3.50	22.33	15.95	6.38	3000	3000	5.0	6.4
14.00	10.54	58.99	65.00	2.10	20.99	11.00	9.99	3000	3000	3.5	6.0
17.00	10.00	22.54	30.00	6.89	26.05	22.27	3.78	3000	3000	7.0	7.5
17.00	10.28	31.40	38.75	6.00	25.65	21.38	4.28	3000	3000	6.7	7.3
17.00	10.77	40.37	47.50	4.92	24.88	19.83	5.05	3000	3000	6.2	7.1
17.00	11.58	49.45	56.25	3.66	23.74	17.25	6.49	3000	3000	5.4	6.8
17.00	13.18	58.61	65.00	2.19	22.33	12.15	10.18	3000	3000	3.8	6.4
20.00	12.48	22.05	30.00	7.22	27.76	23.91	3.84	3000	3000	7.5	7.9
20.00	12.79	30.94	38.75	6.27	27.28	22.93	4.35	3000	3000	7.2	7.8
20.00	13.31	39.93	47.50	5.14	26.43	21.29	5.14	3000	3000	6.7	7.6
20.00	14.15	49.03	56.25	3.81	25.21	18.60	6.61	3000	3000	5.8	7.2
20.00	15.80	58.20	65.00	2.29	23.73	13.36	10.37	3000	3000	4.2	6.8

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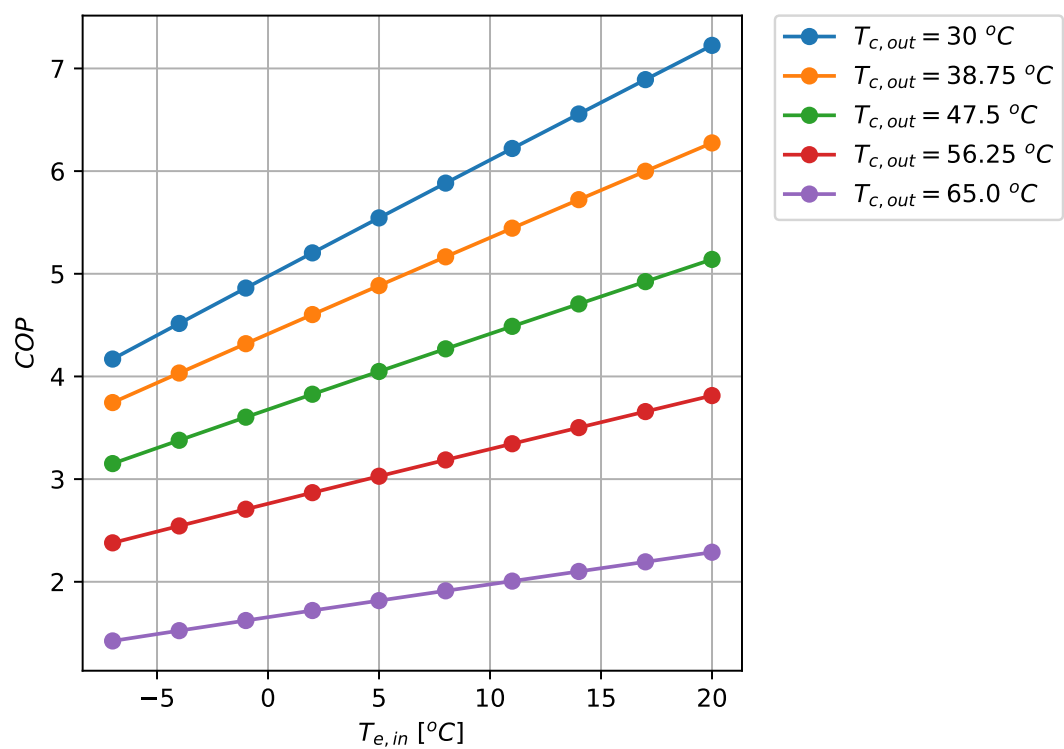


Figure 1: COP Results for the heat pump at the selected points

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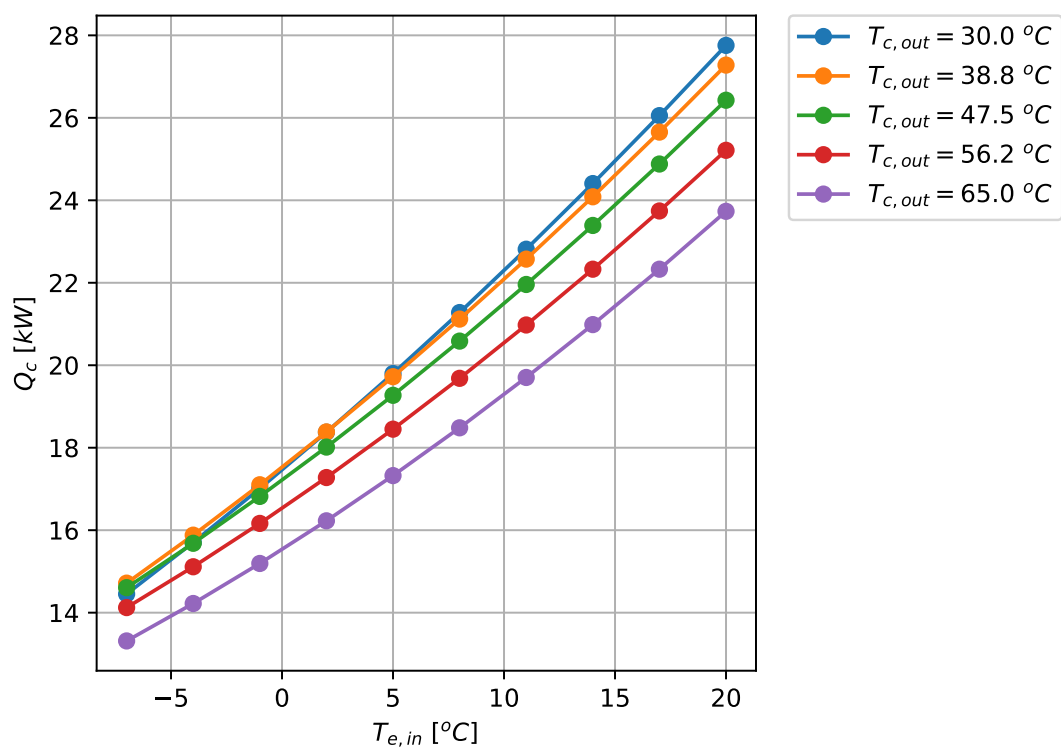


Figure 2: Q_c Results for the heat pump at the selected points