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# Python calculation for heat pump SI8TU

## Parametric Heat Pump calculation

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Table 1: Fitted coefficients for the heat pump.

Coefficient	Description	[kW]
$PQ_1$	1 <sup>st</sup> condenser polynomial coefficient	9.7100e+00
$PQ_2$	2 <sup>st</sup> condenser polynomial coefficient	7.1010e+01
$PQ_3$	3 <sup>st</sup> condenser polynomial coefficient	-1.4100e+01
$PQ_4$	4 <sup>st</sup> condenser polynomial coefficient	-7.1180e+01
$PQ_5$	5 <sup>st</sup> condenser polynomial coefficient	1.7675e+02
$PQ_6$	6 <sup>st</sup> condenser polynomial coefficient	1.4450e+01
$PCOP_1$	1 <sup>st</sup> COP polynomial coefficient	9.6700e+00
$PCOP_2$	2 <sup>st</sup> COP polynomial coefficient	7.4780e+01
$PCOP_3$	3 <sup>st</sup> COP polynomial coefficient	-4.5480e+01
$PCOP_4$	4 <sup>st</sup> COP polynomial coefficient	-2.2890e+02
$PCOP_5$	5 <sup>st</sup> COP polynomial coefficient	1.3432e+02
$PCOP_6$	6 <sup>st</sup> COP polynomial coefficient	6.9780e+01
$\dot{m}_{cond}$	1400.00 [kg/h]	
$\dot{m}_{evap}$	1930.00 [kg/h]	
$COP_{nom}$ (B0W35)	4.97	
$Q_{c,nom}$ (B0W35)	7.89 kW	
$COP_{nom}$ (B2W35)	5.31	
$Q_{c,nom}$ (B2W35)	8.32 kW	
$COP_{nom}$ (B10W35)	6.81	
$Q_{c,nom}$ (B10W35)	10.22 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	$\Delta T_{evap}$ K	$\Delta T_{cond}$ K
-7.00	-9.50	25.92	30.00	4.32	6.65	5.11	1.54	1400	1930	2.5	4.1
-7.00	-9.26	34.82	38.75	3.62	6.40	4.63	1.77	1400	1930	2.3	3.9
-7.00	-9.03	43.71	47.50	3.06	6.18	4.16	2.02	1400	1930	2.0	3.8
-7.00	-8.82	52.58	56.25	2.65	5.98	3.72	2.26	1400	1930	1.8	3.7
-7.00	-8.64	61.44	65.00	2.37	5.80	3.35	2.45	1400	1930	1.6	3.6
-4.00	-6.80	25.56	30.00	4.80	7.23	5.73	1.51	1400	1930	2.8	4.4
-4.00	-6.56	34.48	38.75	4.03	6.96	5.23	1.73	1400	1930	2.6	4.3
-4.00	-6.31	43.38	47.50	3.39	6.71	4.73	1.98	1400	1930	2.3	4.1
-4.00	-6.08	52.27	56.25	2.89	6.49	4.25	2.24	1400	1930	2.1	4.0
-4.00	-5.86	61.14	65.00	2.54	6.30	3.81	2.48	1400	1930	1.9	3.9
-1.00	-4.12	25.18	30.00	5.32	7.85	6.37	1.48	1400	1930	3.1	4.8
-1.00	-3.86	34.11	38.75	4.46	7.55	5.86	1.69	1400	1930	2.9	4.6
-1.00	-3.61	43.03	47.50	3.75	7.28	5.34	1.94	1400	1930	2.6	4.5
-1.00	-3.36	51.93	56.25	3.17	7.04	4.82	2.22	1400	1930	2.4	4.3
-1.00	-3.12	60.81	65.00	2.74	6.83	4.33	2.49	1400	1930	2.1	4.2
2.00	-1.45	24.78	30.00	5.86	8.51	7.06	1.45	1400	1930	3.4	5.2
2.00	-1.19	33.73	38.75	4.93	8.19	6.53	1.66	1400	1930	3.2	5.0
2.00	-0.93	42.66	47.50	4.14	7.89	5.99	1.91	1400	1930	2.9	4.8
2.00	-0.66	51.57	56.25	3.49	7.63	5.44	2.19	1400	1930	2.7	4.7
2.00	-0.40	60.46	65.00	2.97	7.40	4.91	2.49	1400	1930	2.4	4.5
5.00	1.20	24.35	30.00	6.44	9.20	7.77	1.43	1400	1930	3.8	5.6
5.00	1.47	33.32	38.75	5.43	8.86	7.23	1.63	1400	1930	3.5	5.4
5.00	1.74	42.26	47.50	4.56	8.54	6.67	1.87	1400	1930	3.3	5.2
5.00	2.02	51.18	56.25	3.83	8.26	6.10	2.16	1400	1930	3.0	5.1
5.00	2.30	60.09	65.00	3.24	8.00	5.53	2.47	1400	1930	2.7	4.9
8.00	3.83	23.91	30.00	7.06	9.93	8.52	1.41	1400	1930	4.2	6.1
8.00	4.11	32.88	38.75	5.96	9.56	7.96	1.60	1400	1930	3.9	5.9
8.00	4.39	41.84	47.50	5.01	9.23	7.39	1.84	1400	1930	3.6	5.7
8.00	4.68	50.77	56.25	4.21	8.92	6.80	2.12	1400	1930	3.3	5.5
8.00	4.97	59.69	65.00	3.54	8.64	6.20	2.45	1400	1930	3.0	5.3
11.00	6.45	23.44	30.00	7.70	10.70	9.31	1.39	1400	1930	4.5	6.6
11.00	6.73	32.42	38.75	6.53	10.31	8.73	1.58	1400	1930	4.3	6.3
11.00	7.02	41.39	47.50	5.50	9.95	8.14	1.81	1400	1930	4.0	6.1
11.00	7.32	50.34	56.25	4.61	9.62	7.54	2.09	1400	1930	3.7	5.9
11.00	7.62	59.28	65.00	3.87	9.32	6.91	2.41	1400	1930	3.4	5.7
14.00	9.05	22.94	30.00	8.38	11.50	10.13	1.37	1400	1930	4.9	7.1
14.00	9.34	31.94	38.75	7.13	11.09	9.53	1.56	1400	1930	4.7	6.8
14.00	9.63	40.93	47.50	6.02	10.71	8.93	1.78	1400	1930	4.4	6.6
14.00	9.94	49.89	56.25	5.05	10.36	8.31	2.05	1400	1930	4.1	6.4
14.00	10.25	58.84	65.00	4.23	10.04	7.67	2.38	1400	1930	3.7	6.2
17.00	11.63	22.43	30.00	9.09	12.34	10.98	1.36	1400	1930	5.4	7.6
17.00	11.93	31.44	38.75	7.76	11.91	10.37	1.54	1400	1930	5.1	7.3
17.00	12.23	40.44	47.50	6.57	11.51	9.76	1.75	1400	1930	4.8	7.1
17.00	12.54	49.42	56.25	5.53	11.14	9.12	2.02	1400	1930	4.5	6.8
17.00	12.87	58.38	65.00	4.62	10.79	8.46	2.34	1400	1930	4.1	6.6
20.00	14.20	21.89	30.00	9.83	13.22	11.87	1.34	1400	1930	5.8	8.1
20.00	14.50	30.92	38.75	8.42	12.76	11.25	1.52	1400	1930	5.5	7.8
20.00	14.81	39.93	47.50	7.16	12.34	10.62	1.72	1400	1930	5.2	7.6
20.00	15.13	48.92	56.25	6.03	11.95	9.97	1.98	1400	1930	4.9	7.3
20.00	15.46	57.89	65.00	5.05	11.58	9.29	2.29	1400	1930	4.5	7.1

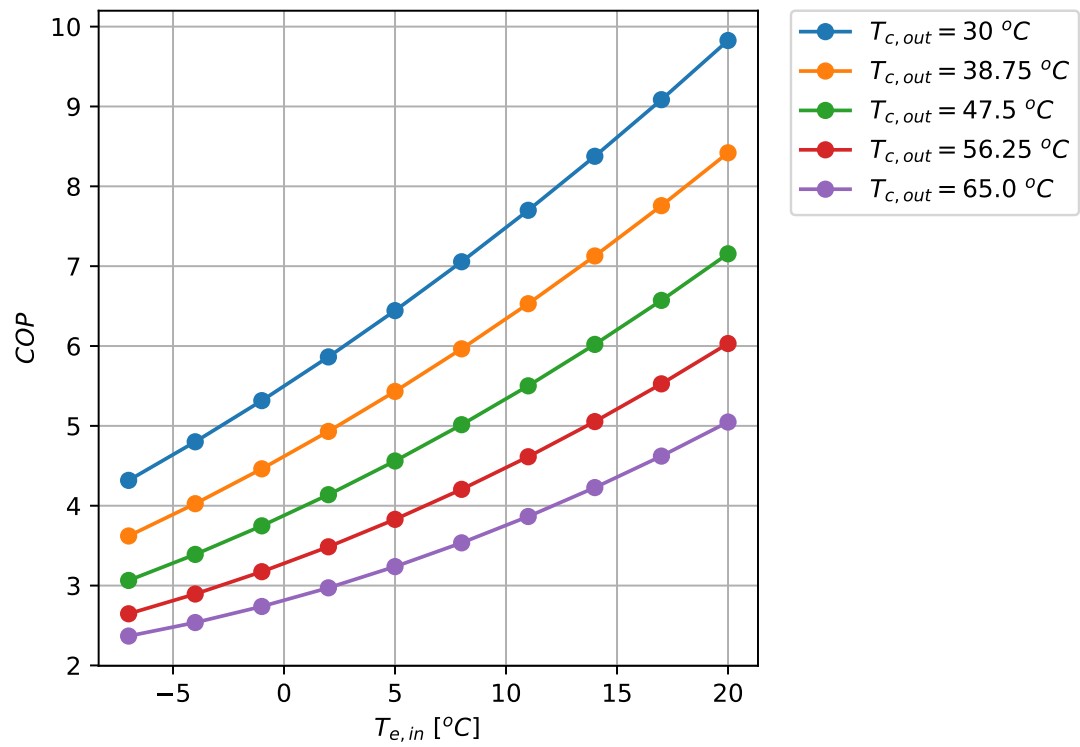


Figure 1: COP Results for the heat pump at the selected points

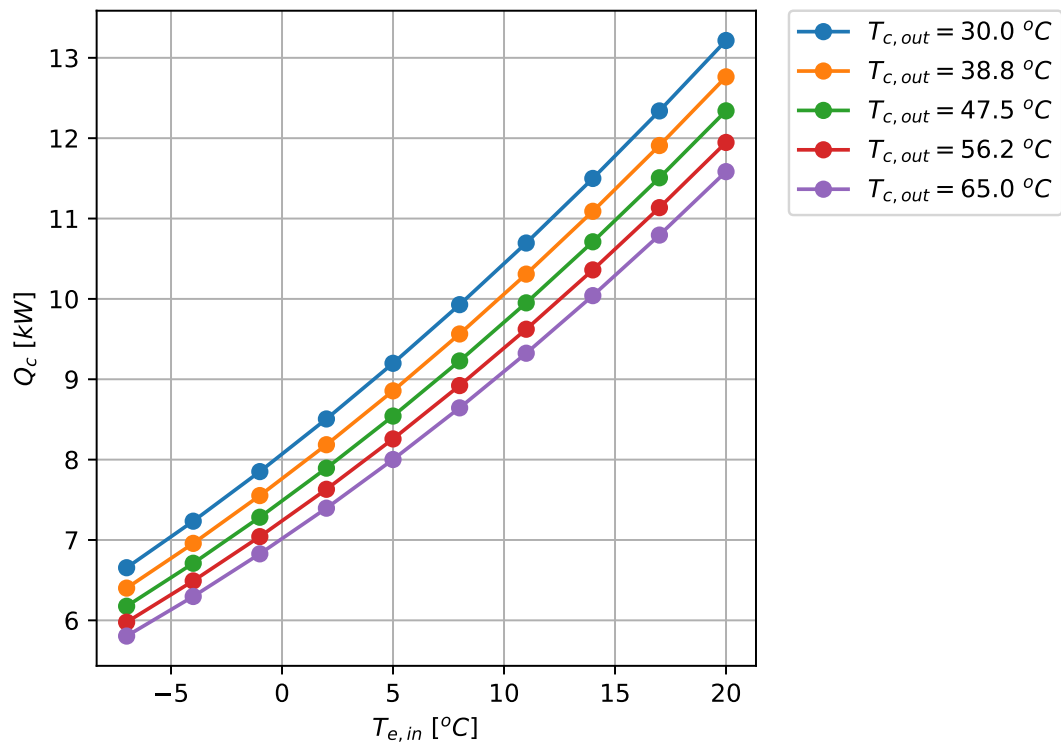


Figure 2:  $Q_c$  Results for the heat pump at the selected points