INSTITUT FÜR SOLARTECHNIK

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Python calculation for heat pump HP25L-M-WEB

Parametric Heat Pump calculation

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2019/02/26 at: 13:20:44 h

Table 1: Fitted coefficients for the heat pump.

Coefficient	Description	
		$[kW]$
PQ_1	1^{st} *condenser polynomial coefficient*	2.5033e+01
PQ_2	2^{st} *condenser polynomial coefficient*	2.2522e+02
PQ_3	3^{st} *condenser polynomial coefficient*	7.3843e+01
PQ_4	4^{st} *condenser polynomial coefficient*	-8.4936e+01
PQ_5	5^{st} *condenser polynomial coefficient*	3.1917e+02
PQ_6	6^{st} *condenser polynomial coefficient*	-4.6866e+02
$PCOP_1$	1^{st} *COP polynomial coefficient*	9.6808e+00
$PCOP_2$	2^{st} *COP polynomial coefficient*	5.3607e+01
$PCOP_3$	3^{st} *COP polynomial coefficient*	-5.5041e+01
$PCOP_4$	4^{st} *COP polynomial coefficient*	-1.7681e+02
$PCOP_5$	5^{st} *COP polynomial coefficient*	7.0311e+01
$PCOP_6$	6^{st} *COP polynomial coefficient*	9.0167e+01
$\dot{m}_{cond}$	4500.00 $[kg/h]$	
$\dot{m}_{evap}$	11250.00 $[kg/h]$	
COP_{nom} (B0W35)	4.10	
$Q_{c,nom}$ (B0W35)	25.20 kW	
COP_{nom} (B2W35)	4.33	
$Q_{c,nom}$ (B2W35)	26.63 kW	
COP_{nom} (B10W35)	5.31	
$Q_{c,nom}$ (B10W35)	32.56 kW	

Table 2: Predicting results of the heat pump.

$T_{evap,in}$ ^oC	$T_{evap,out}$ ^oC	$T_{cond,in}$ ^oC	$T_{cond,out}$ ^oC	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	-11.12	26.02	30.00	3.89	20.85	15.48	5.37	4500	11250	4.1	4.0
-7.00	-10.54	34.94	38.75	3.01	19.93	13.32	6.61	4500	11250	3.5	3.8
-7.00	-9.74	44.05	47.50	2.32	18.08	10.29	7.79	4500	11250	2.7	3.5
-7.00	-8.80	53.34	56.25	1.80	15.23	6.78	8.45	4500	11250	1.8	2.9
-7.00	-7.94	62.85	65.00	1.46	11.27	3.53	7.74	4500	11250	0.9	2.2
-4.00	-8.64	25.64	30.00	4.22	22.85	17.44	5.41	4500	11250	4.6	4.4
-4.00	-8.06	34.56	38.75	3.29	21.94	15.28	6.66	4500	11250	4.1	4.2
-4.00	-7.24	43.66	47.50	2.54	20.10	12.19	7.91	4500	11250	3.2	3.8
-4.00	-6.25	52.95	56.25	1.96	17.27	8.47	8.80	4500	11250	2.3	3.3
-4.00	-5.27	62.45	65.00	1.56	13.36	4.78	8.58	4500	11250	1.3	2.6
-1.00	-6.18	25.24	30.00	4.58	24.92	19.48	5.44	4500	11250	5.2	4.8
-1.00	-5.60	34.17	38.75	3.59	24.00	17.31	6.69	4500	11250	4.6	4.6
-1.00	-4.77	43.27	47.50	2.78	22.17	14.19	7.98	4500	11250	3.8	4.2
-1.00	-3.74	52.55	56.25	2.14	19.37	10.32	9.05	4500	11250	2.7	3.7
-1.00	-2.66	62.04	65.00	1.68	15.50	6.25	9.24	4500	11250	1.7	3.0
2.00	-3.73	24.84	30.00	4.95	27.04	21.58	5.46	4500	11250	5.7	5.2
2.00	-3.16	33.76	38.75	3.90	26.12	19.43	6.70	4500	11250	5.2	5.0
2.00	-2.33	42.86	47.50	3.03	24.30	16.28	8.02	4500	11250	4.3	4.6
2.00	-1.27	52.14	56.25	2.33	21.51	12.30	9.22	4500	11250	3.3	4.1
2.00	-0.11	61.62	65.00	1.81	17.69	7.93	9.76	4500	11250	2.1	3.4
5.00	-1.31	24.42	30.00	5.34	29.22	23.74	5.47	4500	11250	6.3	5.6
5.00	-0.74	33.35	38.75	4.23	28.30	21.61	6.70	4500	11250	5.7	5.4
5.00	0.10	42.44	47.50	3.30	26.49	18.45	8.03	4500	11250	4.9	5.1
5.00	1.17	51.72	56.25	2.54	23.72	14.40	9.32	4500	11250	3.8	4.5
5.00	2.40	61.20	65.00	1.96	19.93	9.78	10.15	4500	11250	2.6	3.8
8.00	1.10	23.99	30.00	5.74	31.45	25.98	5.48	4500	11250	6.9	6.0
8.00	1.66	32.92	38.75	4.57	30.54	23.86	6.68	4500	11250	6.3	5.8
8.00	2.50	42.01	47.50	3.58	28.73	20.71	8.02	4500	11250	5.5	5.5
8.00	3.59	51.29	56.25	2.77	25.98	16.60	9.38	4500	11250	4.4	5.0
8.00	4.87	60.76	65.00	2.13	22.22	11.79	10.42	4500	11250	3.1	4.2
11.00	3.49	23.56	30.00	6.16	33.74	28.27	5.48	4500	11250	7.5	6.4
11.00	4.04	32.48	38.75	4.93	32.83	26.18	6.66	4500	11250	7.0	6.3
11.00	4.88	41.58	47.50	3.88	31.03	23.04	7.99	4500	11250	6.1	5.9
11.00	5.98	50.85	56.25	3.01	28.29	18.90	9.39	4500	11250	5.0	5.4
11.00	7.29	60.31	65.00	2.32	24.56	13.95	10.61	4500	11250	3.7	4.7
14.00	5.86	23.11	30.00	6.60	36.09	30.62	5.47	4500	11250	8.1	6.9
14.00	6.41	32.03	38.75	5.31	35.18	28.55	6.63	4500	11250	7.6	6.7
14.00	7.24	41.13	47.50	4.20	33.38	25.43	7.95	4500	11250	6.8	6.4
14.00	8.34	50.40	56.25	3.27	30.66	21.28	9.37	4500	11250	5.7	5.9
14.00	9.68	59.85	65.00	2.52	26.95	16.24	10.72	4500	11250	4.3	5.1
17.00	8.22	22.65	30.00	7.05	38.50	33.04	5.46	4500	11250	8.8	7.4
17.00	8.76	31.57	38.75	5.70	37.59	30.99	6.59	4500	11250	8.2	7.2
17.00	9.59	40.67	47.50	4.53	35.79	27.90	7.90	4500	11250	7.4	6.8
17.00	10.69	49.93	56.25	3.54	33.08	23.75	9.33	4500	11250	6.3	6.3
17.00	12.05	59.39	65.00	2.73	29.40	18.64	10.76	4500	11250	5.0	5.6
20.00	10.56	22.18	30.00	7.52	40.96	35.51	5.45	4500	11250	9.4	7.8
20.00	11.10	31.10	38.75	6.11	40.05	33.49	6.56	4500	11250	8.9	7.6
20.00	11.91	40.19	47.50	4.88	38.26	30.42	7.84	4500	11250	8.1	7.3
20.00	13.01	49.46	56.25	3.84	35.56	26.29	9.27	4500	11250	7.0	6.8
20.00	14.38	58.91	65.00	2.96	31.90	21.14	10.76	4500	11250	5.6	6.1

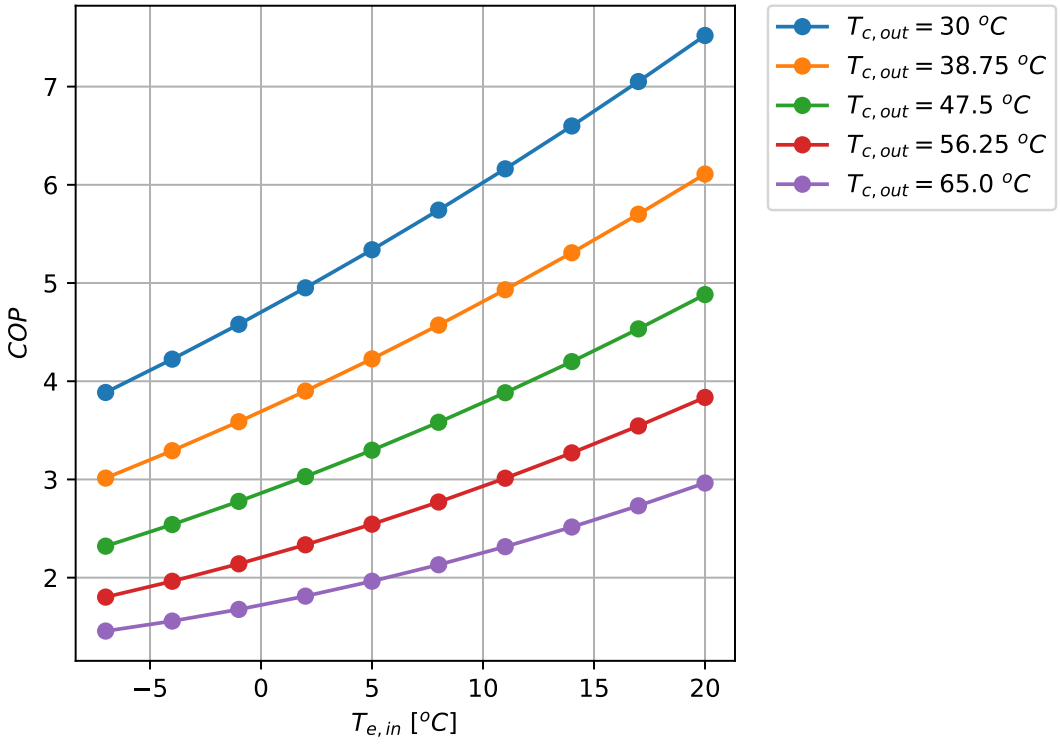

Figure 1: COP Results for the heat pump at the selected points

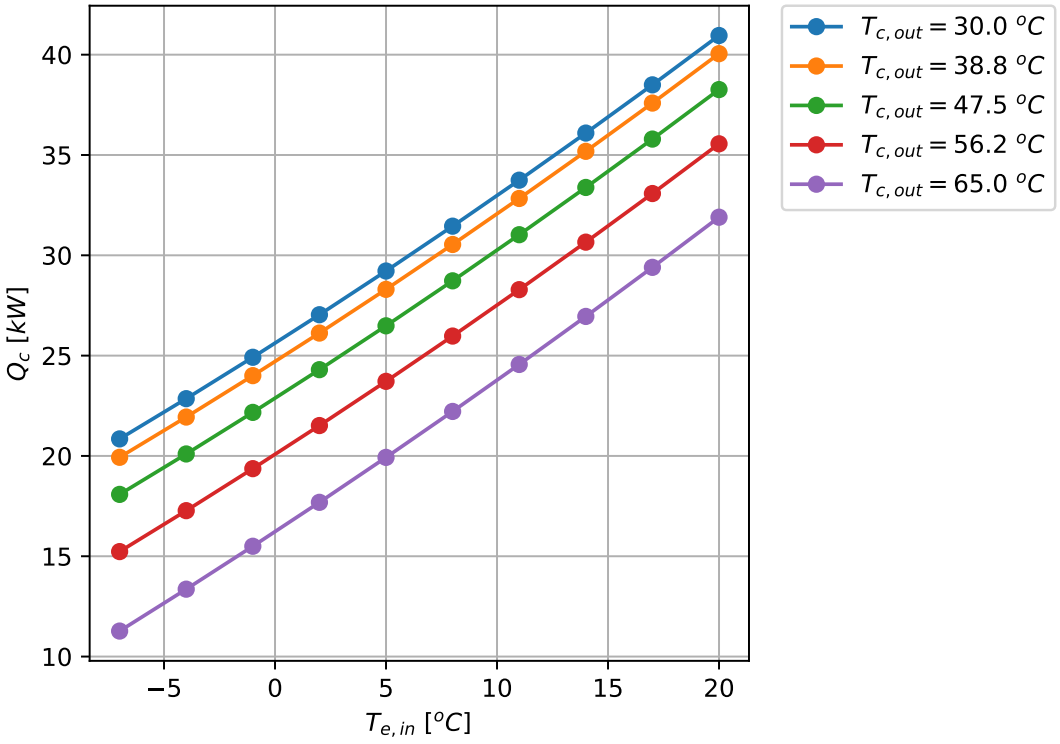

Figure 2: Q_c Results for the heat pump at the selected points