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Python calculation for heat pump ProDomo13-R410A

Parametric Heat Pump calculation

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Table 1: Fitted coefficients for the heat pump.

Coefficient	Description	
		$[kW]$
PQ_1	1st condenser polynomial coefficient	1.4868e+01
PQ_2	2st condenser polynomial coefficient	1.2747e+02
PQ_3	3st condenser polynomial coefficient	-1.3745e+01
PQ_4	4st condenser polynomial coefficient	-2.1650e+02
PQ_5	5st condenser polynomial coefficient	3.9254e+02
PQ_6	6st condenser polynomial coefficient	-7.9875e+00
$PCOP_1$	1st COP polynomial coefficient	1.2411e+01
$PCOP_2$	2st COP polynomial coefficient	6.1891e+01
$PCOP_3$	3st COP polynomial coefficient	-8.3490e+01
$PCOP_4$	4st COP polynomial coefficient	-2.3331e+02
$PCOP_5$	5st COP polynomial coefficient	1.0307e+02
$PCOP_6$	6st COP polynomial coefficient	1.7703e+02
$\dot{m}_{cond}$	3000.00 $[kg/h]$	
$\dot{m}_{evap}$	2800.00 $[kg/h]$	
COP_{nom} (B0W35)	4.68	
$Q_{c,nom}$ (B0W35)	12.48 kW	
COP_{nom} (B2W35)	4.92	
$Q_{c,nom}$ (B2W35)	13.17 kW	
COP_{nom} (B10W35)	6.00	
$Q_{c,nom}$ (B10W35)	16.29 kW	

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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	-9.76	26.99	30.00	4.57	10.50	8.20	2.30	3000	2800	2.8	3.0
-7.00	-9.47	35.82	38.75	3.50	10.25	7.32	2.93	3000	2800	2.5	2.9
-7.00	-9.16	44.64	47.50	2.79	9.98	6.40	3.58	3000	2800	2.2	2.9
-7.00	-8.92	53.48	56.25	2.43	9.67	5.70	3.97	3000	2800	1.9	2.8
-7.00	-8.85	62.33	65.00	2.44	9.33	5.50	3.83	3000	2800	1.9	2.7
-4.00	-7.06	26.74	30.00	4.93	11.39	9.08	2.31	3000	2800	3.1	3.3
-4.00	-6.74	35.58	38.75	3.78	11.07	8.14	2.93	3000	2800	2.7	3.2
-4.00	-6.40	44.42	47.50	2.98	10.74	7.14	3.60	3000	2800	2.4	3.1
-4.00	-6.12	53.28	56.25	2.54	10.37	6.29	4.08	3000	2800	2.1	3.0
-4.00	-5.99	62.15	65.00	2.46	9.96	5.92	4.04	3000	2800	2.0	2.9
-1.00	-4.38	26.46	30.00	5.31	12.36	10.04	2.33	3000	2800	3.4	3.5
-1.00	-4.05	35.32	38.75	4.07	11.98	9.04	2.94	3000	2800	3.0	3.4
-1.00	-3.68	44.18	47.50	3.20	11.58	7.96	3.62	3000	2800	2.7	3.3
-1.00	-3.35	53.06	56.25	2.68	11.15	6.99	4.16	3000	2800	2.4	3.2
-1.00	-3.17	61.94	65.00	2.52	10.68	6.43	4.24	3000	2800	2.2	3.1
2.00	-1.73	26.16	30.00	5.72	13.42	11.07	2.35	3000	2800	3.7	3.8
2.00	-1.38	35.03	38.75	4.40	12.98	10.03	2.95	3000	2800	3.4	3.7
2.00	-0.99	43.92	47.50	3.44	12.51	8.88	3.64	3000	2800	3.0	3.6
2.00	-0.62	52.81	56.25	2.84	12.02	7.79	4.24	3000	2800	2.6	3.4
2.00	-0.38	61.71	65.00	2.59	11.48	7.06	4.43	3000	2800	2.4	3.3
5.00	0.89	25.83	30.00	6.15	14.56	12.19	2.37	3000	2800	4.1	4.2
5.00	1.26	34.73	38.75	4.75	14.05	11.09	2.96	3000	2800	3.7	4.0
5.00	1.67	43.63	47.50	3.71	13.53	9.88	3.65	3000	2800	3.3	3.9
5.00	2.08	52.53	56.25	3.02	12.97	8.68	4.29	3000	2800	2.9	3.7
5.00	2.38	61.46	65.00	2.70	12.37	7.78	4.59	3000	2800	2.6	3.5
8.00	3.49	25.48	30.00	6.61	15.78	13.39	2.39	3000	2800	4.5	4.5
8.00	3.88	34.39	38.75	5.12	15.21	12.24	2.97	3000	2800	4.1	4.4
8.00	4.31	43.31	47.50	4.00	14.62	10.96	3.66	3000	2800	3.7	4.2
8.00	4.74	52.24	56.25	3.23	14.01	9.67	4.33	3000	2800	3.3	4.0
8.00	5.10	61.18	65.00	2.82	13.35	8.62	4.73	3000	2800	2.9	3.8
11.00	6.06	25.11	30.00	7.09	17.08	14.67	2.41	3000	2800	4.9	4.9
11.00	6.46	34.04	38.75	5.52	16.45	13.47	2.98	3000	2800	4.5	4.7
11.00	6.91	42.98	47.50	4.31	15.80	12.13	3.66	3000	2800	4.1	4.5
11.00	7.38	51.92	56.25	3.46	15.12	10.76	4.36	3000	2800	3.6	4.3
11.00	7.78	60.87	65.00	2.97	14.41	9.56	4.84	3000	2800	3.2	4.1
14.00	8.60	24.71	30.00	7.59	18.46	16.03	2.43	3000	2800	5.4	5.3
14.00	9.02	33.66	38.75	5.94	17.76	14.78	2.99	3000	2800	5.0	5.1
14.00	9.49	42.62	47.50	4.65	17.05	13.39	3.67	3000	2800	4.5	4.9
14.00	9.98	51.58	56.25	3.72	16.32	11.94	4.38	3000	2800	4.0	4.7
14.00	10.43	60.55	65.00	3.15	15.55	10.61	4.94	3000	2800	3.6	4.5
17.00	11.12	24.30	30.00	8.13	19.92	17.46	2.45	3000	2800	5.9	5.7
17.00	11.55	33.26	38.75	6.39	19.16	16.16	3.00	3000	2800	5.4	5.5
17.00	12.04	42.23	47.50	5.02	18.39	14.72	3.67	3000	2800	5.0	5.3
17.00	12.55	51.21	56.25	4.00	17.60	13.20	4.39	3000	2800	4.4	5.0
17.00	13.04	60.20	65.00	3.35	16.77	11.76	5.01	3000	2800	4.0	4.8
20.00	13.61	23.86	30.00	8.68	21.45	18.98	2.47	3000	2800	6.4	6.1
20.00	14.06	32.84	38.75	6.86	20.63	17.63	3.01	3000	2800	5.9	5.9
20.00	14.56	41.83	47.50	5.41	19.80	16.14	3.66	3000	2800	5.4	5.7
20.00	15.10	50.82	56.25	4.31	18.95	14.55	4.40	3000	2800	4.9	5.4
20.00	15.62	59.83	65.00	3.57	18.06	13.01	5.05	3000	2800	4.4	5.2

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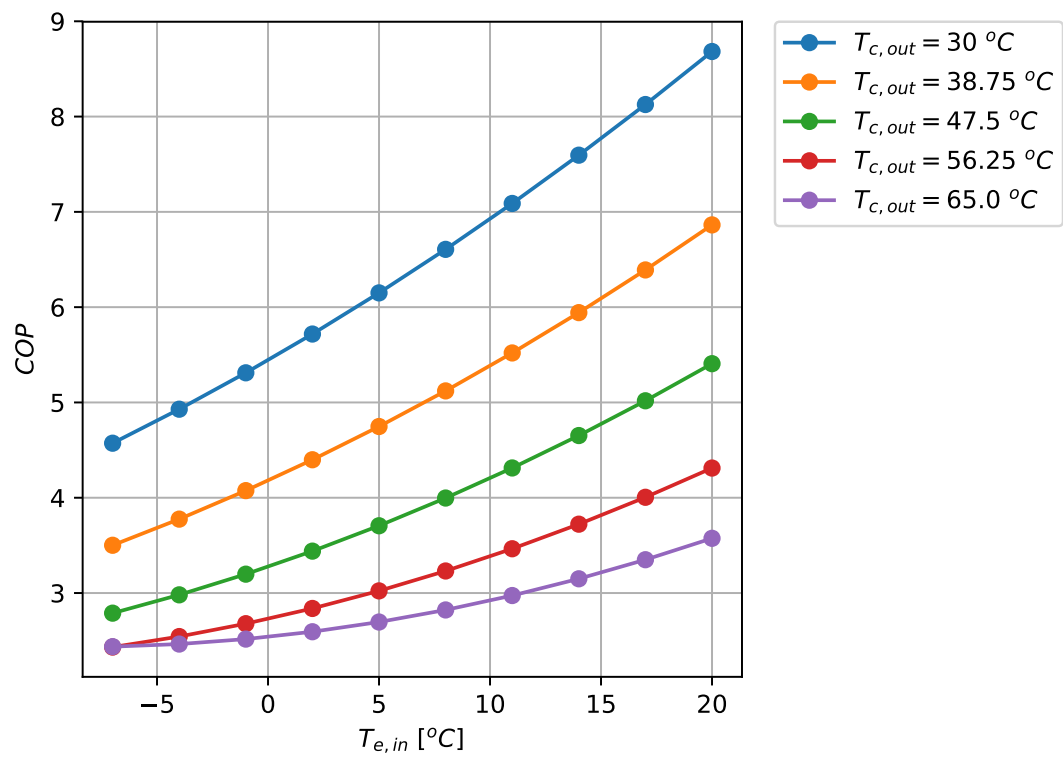
Figure 1: COP Results for the heat pump at the selected points

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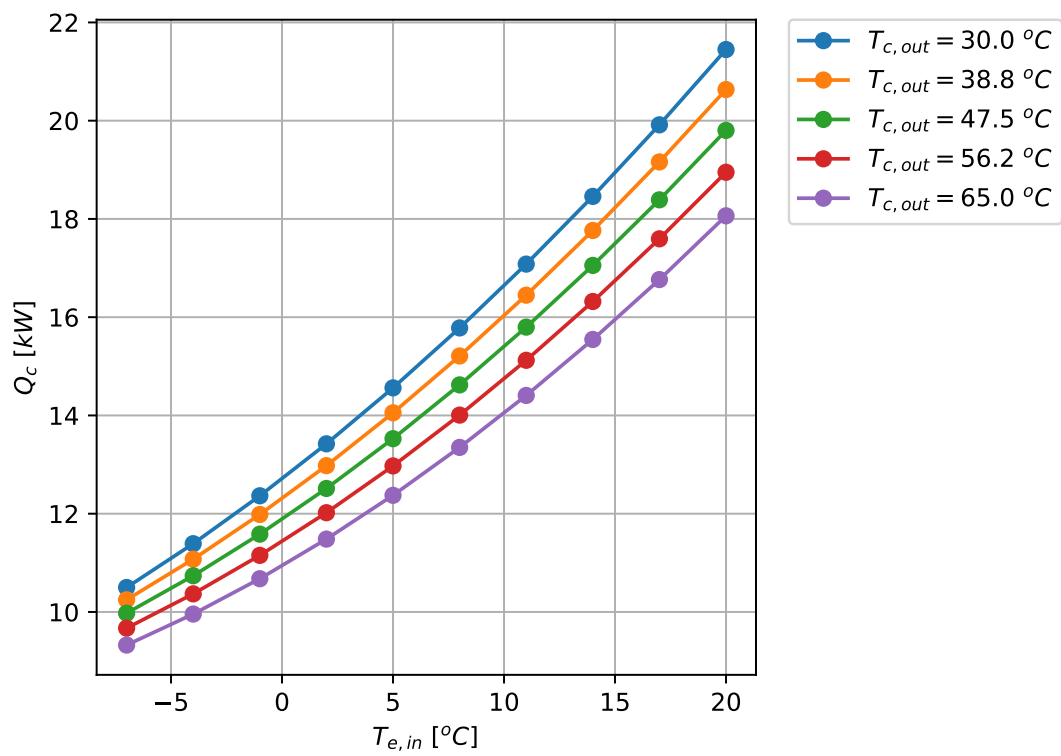HOCHSCHULE FÜR TECHNIK
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Figure 2: Q_c Results for the heat pump at the selected points