



$\begin{array}{c} {\bf Python~calculation~for~heat~pump}\\ {\bf SIN-22TU} \end{array}$

Parametric Heat Pump calculation

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Table 1: Fitted coefficients for the heat pump.

Coefficient	Description	
		[kW]
PQ_1	1^{st} condenser polynomial coefficient	2.2267e+01
PQ_2	2^{st} condenser polynomial coefficient	2.0015e+02
PQ_3	3^{st} condenser polynomial coefficient	4.1062e+01
PQ_4	4^{st} condenser polynomial coefficient	-2.4655e + 02
PQ_5	5^{st} condenser polynomial coefficient	-2.0174e + 02
PQ_6	6^{st} condenser polynomial coefficient	-2.1232e+02
$PCOP_1$	1 st COP polynomial coefficient	5.6654e+00
$PCOP_2$	2^{st} COP polynomial coefficient	3.5744e + 01
$PCOP_3$	3^{st} COP polynomial coefficient	3.3127e+00
$PCOP_4$	4 st COP polynomial coefficient	-7.4772e + 01
$PCOP_5$	5^{st} COP polynomial coefficient	-1.5825e + 02
$PCOP_6$	6 st COP polynomial coefficient	-8.9463e+01
\dot{m}_{cond}	$4000.00 \ [kg/h]$	
\dot{m}_{evap}	$4000.00 \ [kg/h]$	
COP_{nom} (B0W35)	4.57	
$Q_{c,nom}$ (B0W35)	$22.82~\mathrm{kW}$	
COP_{nom} (B2W35)	4.77	
$Q_{c,nom}$ (B2W35)	$24.00~\mathrm{kW}$	
COP_{nom} (B10W35)	5.44	
$Q_{c,nom}$ (B10W35)	28.57 kW	





Table 2: Predicting results of the heat pump.

-7.00	$T_{evap,in}$	$T_{evap,out}$	$T_{cond,in}$	$T_{cond,out}$	COP	Q_{cond}	Q_{evap}	W_{comp}	\dot{m}_{cond}	\dot{m}_{evap}	ΔT_{evap}	ΔT_{cond}
-7.00 -10.13 34.77 38.75 3.53 18.51 13.27 5.24 4000 4000 2.8 3.9 -7.00 -9.08 43.61 47.50 2.87 18.13 11.80 6.33 4000 4000 2.8 3.9 -7.00 -7.20 61.45 65.00 1.05 16.54 0.84 15.71 4000 400 0.2 3.6 -4.00 -7.72 26.52 30.0 4.40 0.61 4.61 4.00 400 400 4.00 4.00 4.00 3.2 4.33 4.75 3.20 19.87 13.67 6.21 4000 400 3.2 4.3 -4.00 -5.51 61.13 65.02 2.34 19.05 10.90 8.16 4000 400 3.2 4.3 -1.00 -6.57 52.16 56.22 3.31 11.68 13.9 14.0 40.0 400 400 3.0 4.1 4.8 4.0 4	°C	°C	°C	°C	[-]	[kW]	[kW]	[kW]	kg/h	kg/h	K	K
-7.00 -9.78 43.61 47.50 2.87 18.13 11.80 63.33 4000 4000 2.8 3.9 -7.00 -9.08 52.51 56.52 2.03 17.40 8.82 8.58 4000 4000 0.02 3.6 -4.00 -7.72 25.62 30.00 4.40 20.40 15.76 4.64 4000 4000 3.6 4.4 -4.00 -7.22 43.23 47.50 3.20 19.87 13.67 6.21 4000 4000 3.6 4.4 -4.00 -5.01 61.13 65.00 1.31 18.01 4.30 13.71 4000 4000 3.6 4.4 -4.00 -5.01 61.13 65.00 1.31 18.01 4.30 13.71 4000 4000 400 4.6 4.8 -1.00 -4.64 42.86 47.50 3.51 21.58 15.43 61.5 4000 4000 400 4.6												
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-4.00 -7.72 25.62 30.00 4.40 20.40 15.76 4.64 4000 4000 3.7 4.4 -4.00 -7.56 34.38 38.75 3.89 20.33 15.10 5.23 4000 4000 3.6 4.4 -4.00 -6.57 52.16 56.25 2.34 19.05 10.90 8.16 4000 4000 2.6 4.3 -4.00 -5.01 61.13 65.00 1.31 18.01 4.30 13.71 4000 4000 1.0 1.9 -1.00 -5.14 25.22 30.00 4.75 22.25 17.57 4.69 4000 4000 4.0 4.8 -1.00 -4.64 42.86 47.50 3.51 15.53 6.15 4.0 4.0 4.0 4.0 4.6 4.6 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0												
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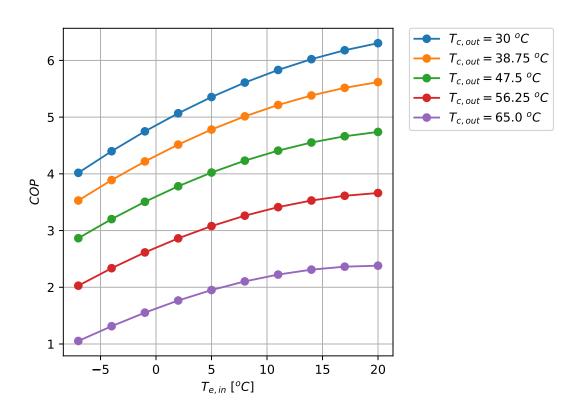


Figure 1: COP Results for the heat pump at the selected points





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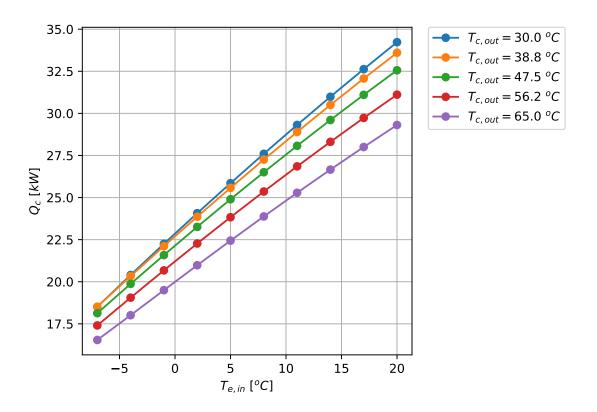


Figure 2: Q_c Results for the heat pump at the selected points