
Type977 fitting for heat pump Propane2HPFit_Min

Parametric Heat Pump calculation

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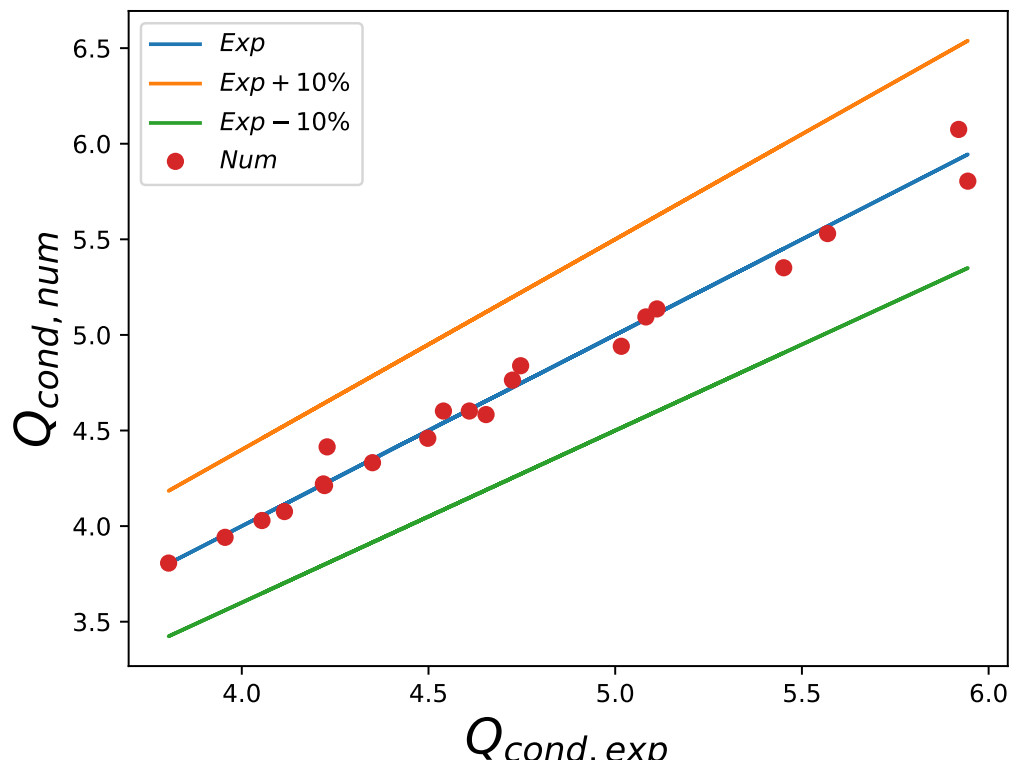


Figure 1: Q_{cond} differences between experiments and fitted data

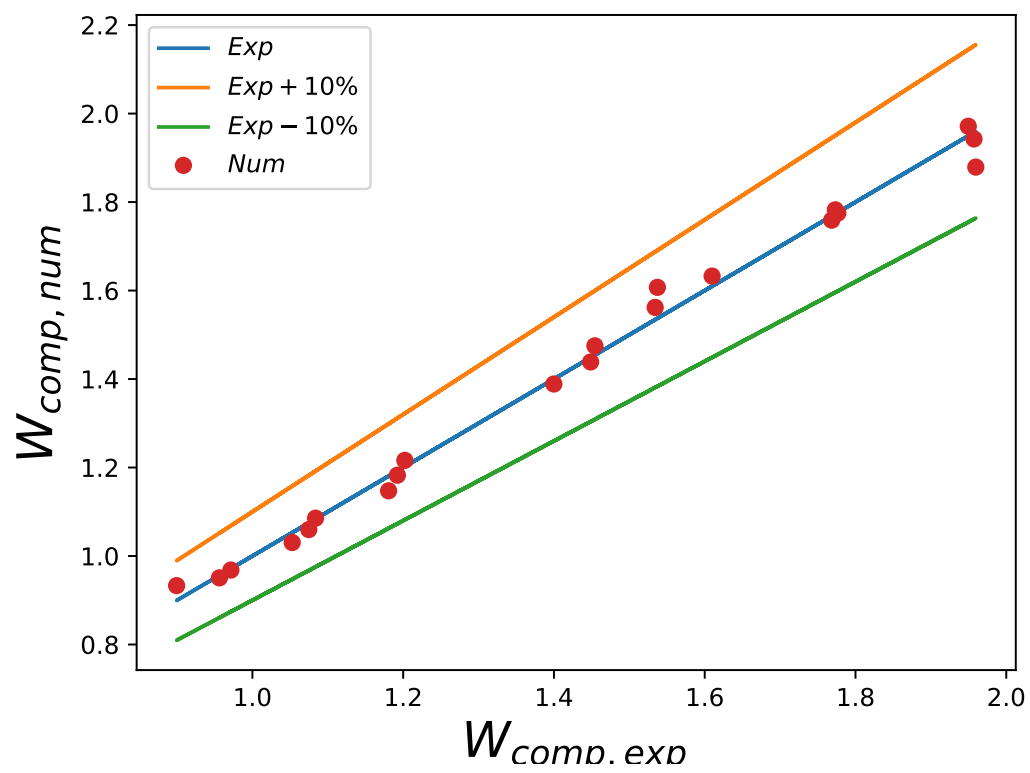


Figure 2: W_{comp} differences between experiments and fitted data

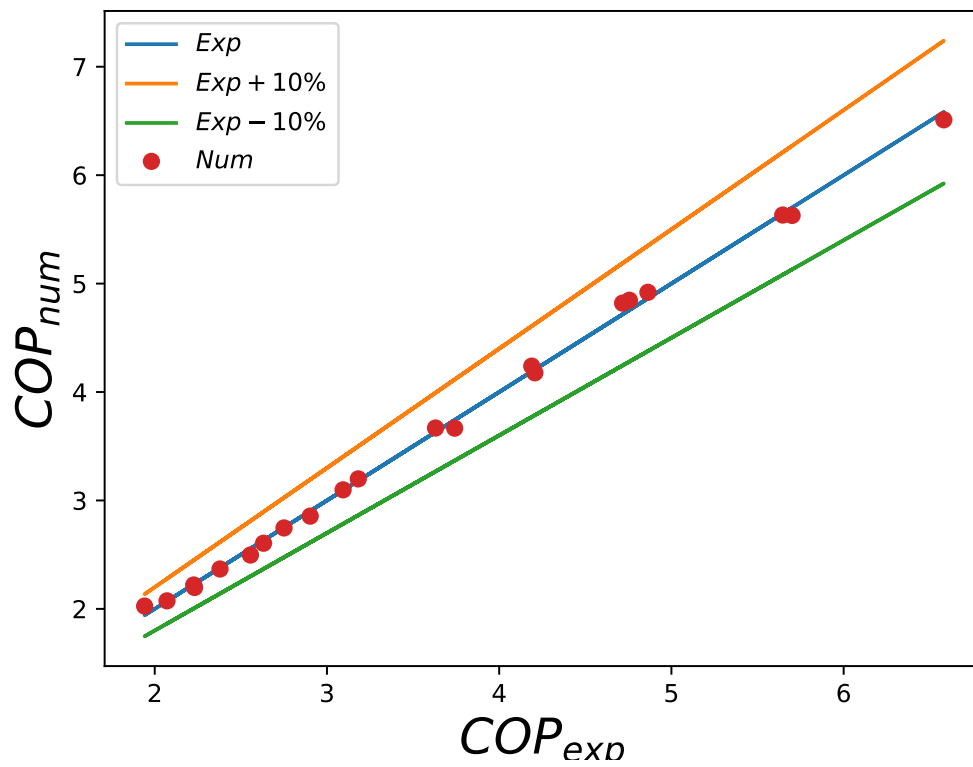


Figure 3: COP differences between experiments and fitted data

Table 1: Fitted coefficients for the heat pump.

Coefficient	Description	[kW]
P_{Q_1}	1 st condenser polynomial coefficient	6.0662e+00
P_{Q_2}	2 nd condenser polynomial coefficient	5.9980e+01
P_{Q_3}	3 rd condenser polynomial coefficient	-1.0648e+01
P_{Q_4}	4 th condenser polynomial coefficient	-1.9263e+02
P_{Q_5}	5 th condenser polynomial coefficient	5.6755e+01
P_{Q_6}	6 th condenser polynomial coefficient	6.0667e+00
P_{COP_1}	1 st COP polynomial coefficient	1.1661e+01
P_{COP_2}	2 nd COP polynomial coefficient	8.4819e+01
P_{COP_3}	3 rd COP polynomial coefficient	-7.0508e+01
P_{COP_4}	4 th COP polynomial coefficient	-3.4235e+02
P_{COP_5}	5 th COP polynomial coefficient	9.4717e+01
P_{COP_6}	6 th COP polynomial coefficient	1.2687e+02
\dot{m}_{cond}	461.30 [kg/h]	
\dot{m}_{evap}	836.03 [kg/h]	
COP_{nom} (A0W35)	4.67	
$Q_{cond,nom}$ (A0W35)	4.55 [kW]	
$Q_{evap,nom}$ (A0W35)	3.58 [kW]	
$W_{comp,nom}$ (A0W35)	0.97 [kW]	
RMS_{COP}	$5.25e - 02$	
$RMS_{Q_{cond}}$	$7.54e - 02$	
$RMS_{W_{comp}}$	$2.88e - 02$	
Fit model	Average Temperature	

Table 2: Differences between experiments and fitted data for the heat pump. $error = 100 \cdot \left| \frac{Q_{exp} - Q_{num}}{Q_{exp}} \right|$ and

$$RMS = \sqrt{\sum \frac{(Q_{exp} - Q_{num})^2}{n_p}} \text{ where } n_p \text{ is the number of data points.}$$

$T_{cond,avg}$ °C	$T_{evap,in}$ °C	COP [—]	COP_{exp} [—]	error [%]	Q_{cond} [kW]	$Q_{cond,exp}$ [kW]	error [%]	W_{comp} [kW]	$W_{comp,exp}$ [kW]	error [%]
35.00	0.39	4.92	4.86	1.2	4.76	4.72	0.8	0.97	0.97	0.33
39.98	0.30	4.24	4.19	1.2	4.60	4.54	1.4	1.09	1.08	0.16
44.98	0.31	3.67	3.74	2.0	4.46	4.50	0.9	1.22	1.20	1.16
55.01	0.31	2.86	2.90	1.6	4.21	4.22	0.2	1.48	1.45	1.43
59.98	0.36	2.50	2.56	2.3	4.08	4.11	0.9	1.63	1.61	1.42
64.99	0.34	2.22	2.23	0.3	3.94	3.96	0.4	1.78	1.78	0.08
70.00	0.38	2.03	1.94	4.4	3.81	3.80	0.1	1.88	1.96	4.11
35.01	4.96	5.63	5.70	1.3	5.35	5.45	1.8	0.95	0.96	0.58
39.98	4.99	4.85	4.76	1.9	5.14	5.11	0.5	1.06	1.07	1.40
44.97	4.97	4.18	4.21	0.7	4.94	5.02	1.5	1.18	1.19	0.81
54.97	4.98	3.20	3.18	0.5	4.60	4.61	0.2	1.44	1.45	0.70
59.65	5.01	2.75	2.75	0.1	4.41	4.23	4.4	1.61	1.54	4.55
65.00	4.97	2.37	2.38	0.5	4.22	4.22	0.0	1.78	1.77	0.52
70.00	4.97	2.07	2.07	0.1	4.03	4.05	0.6	1.94	1.96	0.74
34.81	9.99	6.51	6.58	1.1	6.07	5.92	2.6	0.93	0.90	3.74
40.01	9.95	5.63	5.65	0.2	5.80	5.94	2.4	1.03	1.05	2.11
45.01	9.95	4.82	4.72	2.2	5.53	5.57	0.7	1.15	1.18	2.82
54.87	9.99	3.67	3.63	1.0	5.09	5.08	0.2	1.39	1.40	0.79
59.68	10.00	3.10	3.09	0.1	4.84	4.75	1.9	1.56	1.53	1.80
64.98	9.99	2.61	2.63	1.0	4.58	4.65	1.5	1.76	1.77	0.53
70.00	9.95	2.20	2.23	1.5	4.33	4.35	0.4	1.97	1.95	1.11
Sum				25.3			23.4			30.90
RMS_{COP}	5.25e − 02									
$RMS_{Q_{cond}}$	7.54e − 02									
$RMS_{W_{comp}}$	2.88e − 02									