
Type977 fitting for heat pump SI-GEO-15-70

Parametric Heat Pump calculation

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2019/03/12 at: 16:02:13 h

Table 1: Fitted coefficients for the heat pump.

Coefficient	Description	[kW]
P_{Q_1}	1 st condenser polynomial coefficient	5.6979e+01
P_{Q_2}	2 st condenser polynomial coefficient	6.8526e+02
P_{Q_3}	3 st condenser polynomial coefficient	1.6528e+02
P_{Q_4}	4 st condenser polynomial coefficient	-6.5796e+02
P_{Q_5}	5 st condenser polynomial coefficient	2.4441e+02
P_{Q_6}	6 st condenser polynomial coefficient	-8.4816e+02
P_{COP_1}	1 st COP polynomial coefficient	4.8763e+00
P_{COP_2}	2 st COP polynomial coefficient	6.4325e+01
P_{COP_3}	3 st COP polynomial coefficient	1.2688e+01
P_{COP_4}	4 st COP polynomial coefficient	-1.7647e+02
P_{COP_5}	5 st COP polynomial coefficient	-6.8752e+00
P_{COP_6}	6 st COP polynomial coefficient	-1.1758e+02
\dot{m}_{cond}	9771.00 [kg/h]	
\dot{m}_{evap}	9771.00 [kg/h]	
COP_{nom} (A0W35)	4.32	
$Q_{cond,nom}$ (A0W35)	59.10 [kW]	
$Q_{evap,nom}$ (A0W35)	45.43 [kW]	
$W_{comp,nom}$ (A0W35)	13.67 [kW]	
RMS_{COP}	$6.11e - 02$	
$RMS_{Q_{cond}}$	$1.30e - 01$	
$RMS_{W_{comp}}$	$2.04e - 01$	
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 $RMS = \sqrt{\sum \frac{(Q_{exp} - Q_{num})^2}{n_p}}$ where n_p is the number of data points.

$T_{cond,out}$ °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	-5.00	3.64	3.70	1.6	49.78	49.83	0.1	13.69	13.48	1.56
35.00	0.00	4.37	4.20	4.1	59.72	59.60	0.2	13.65	14.19	3.78
35.00	5.00	5.12	5.20	1.6	69.82	69.86	0.1	13.64	13.44	1.53
50.00	-5.00	2.69	2.67	1.1	46.61	46.70	0.2	17.30	17.52	1.24
50.00	0.00	3.29	3.23	1.7	56.12	55.82	0.5	17.06	17.27	1.17
50.00	5.00	3.89	3.83	1.6	65.80	65.69	0.2	16.90	17.15	1.43
45.00	-5.00	3.09	3.11	0.9	48.16	48.27	0.2	15.61	15.51	0.66
45.00	0.00	3.73	3.78	1.3	57.83	57.72	0.2	15.50	15.27	1.51
45.00	5.00	4.38	4.43	1.1	67.66	67.78	0.2	15.44	15.29	0.95
55.00	0.00	2.77	2.80	1.1	53.94	53.93	0.0	19.47	19.25	1.14
55.00	5.00	3.33	3.35	0.6	63.47	63.61	0.2	19.08	19.00	0.40
35.00	10.00	5.87	5.90	0.5	80.07	80.12	0.1	13.65	13.58	0.49
35.00	15.00	6.62	6.58	0.5	90.47	90.38	0.1	13.67	13.73	0.44
50.00	10.00	4.50	4.44	1.5	75.64	75.56	0.1	16.80	17.03	1.34
50.00	15.00	5.11	5.05	1.3	85.62	85.42	0.2	16.75	16.92	1.05
45.00	10.00	5.04	5.08	0.9	77.64	77.84	0.3	15.41	15.31	0.63
45.00	15.00	5.70	5.74	0.7	87.76	87.91	0.2	15.40	15.32	0.52
55.00	10.00	3.89	3.91	0.5	73.15	73.28	0.2	18.82	18.76	0.35
55.00	15.00	4.45	4.48	0.7	82.99	82.95	0.0	18.65	18.52	0.75
Sum				23.4			3.2			20.91
RMS_{COP}	6.11e - 02									
$RMS_{Q_{cond}}$	1.30e - 01									
$RMS_{W_{comp}}$	2.04e - 01									

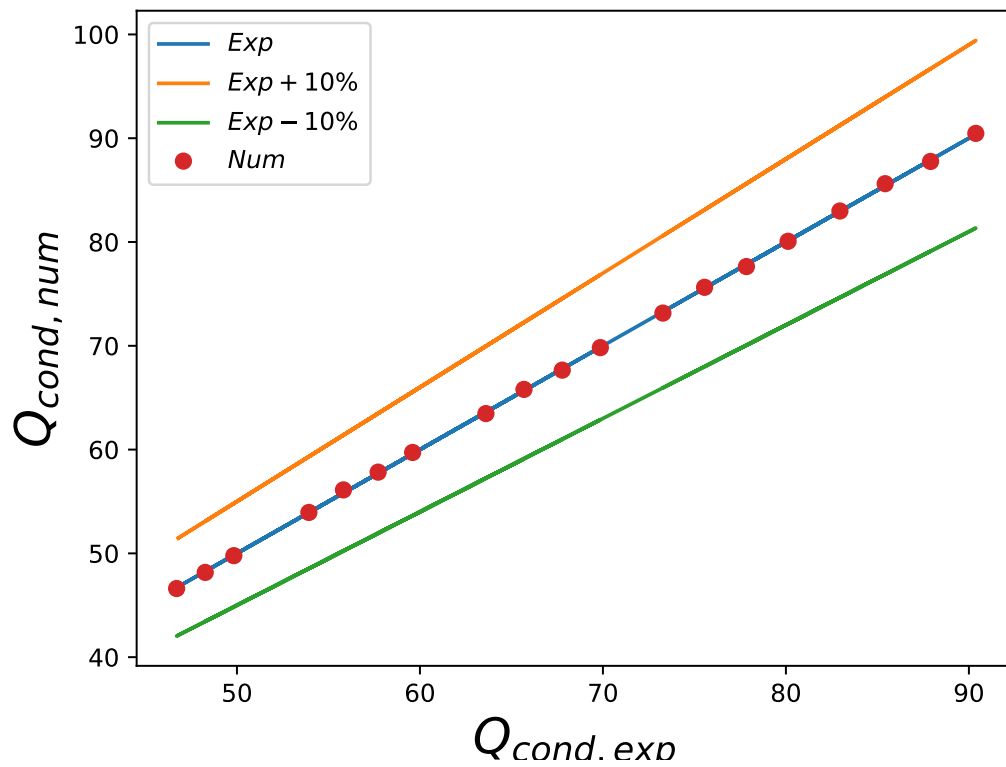


Figure 1: Q_{cond} differences between experiments and fitted data

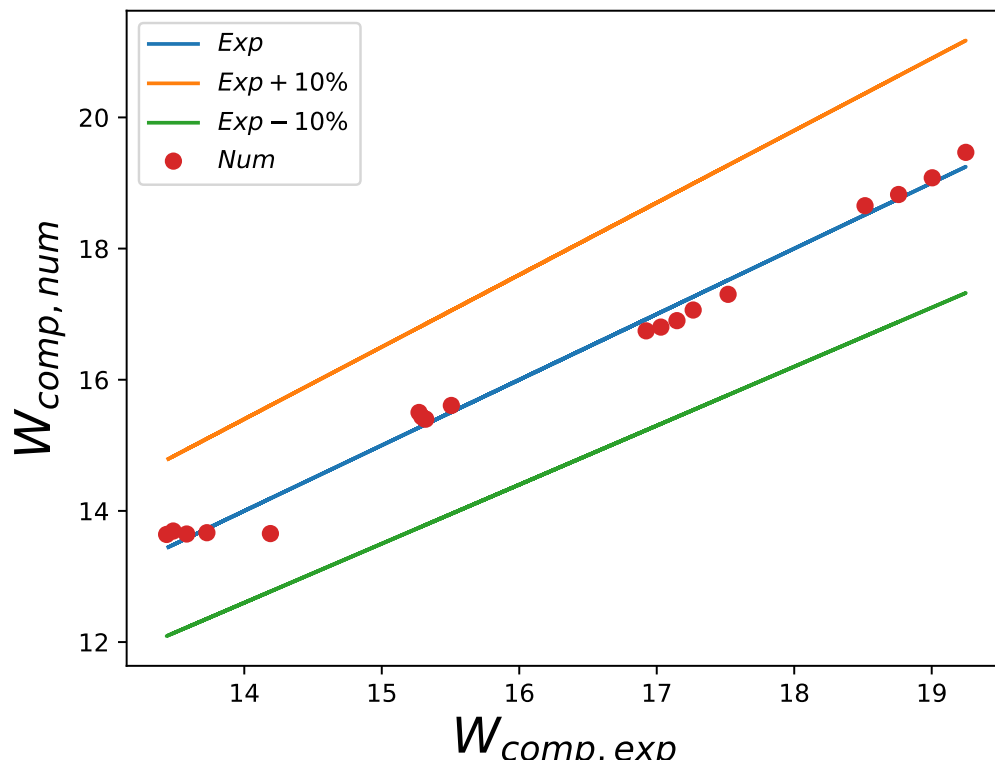


Figure 2: W_{comp} differences between experiments and fitted data

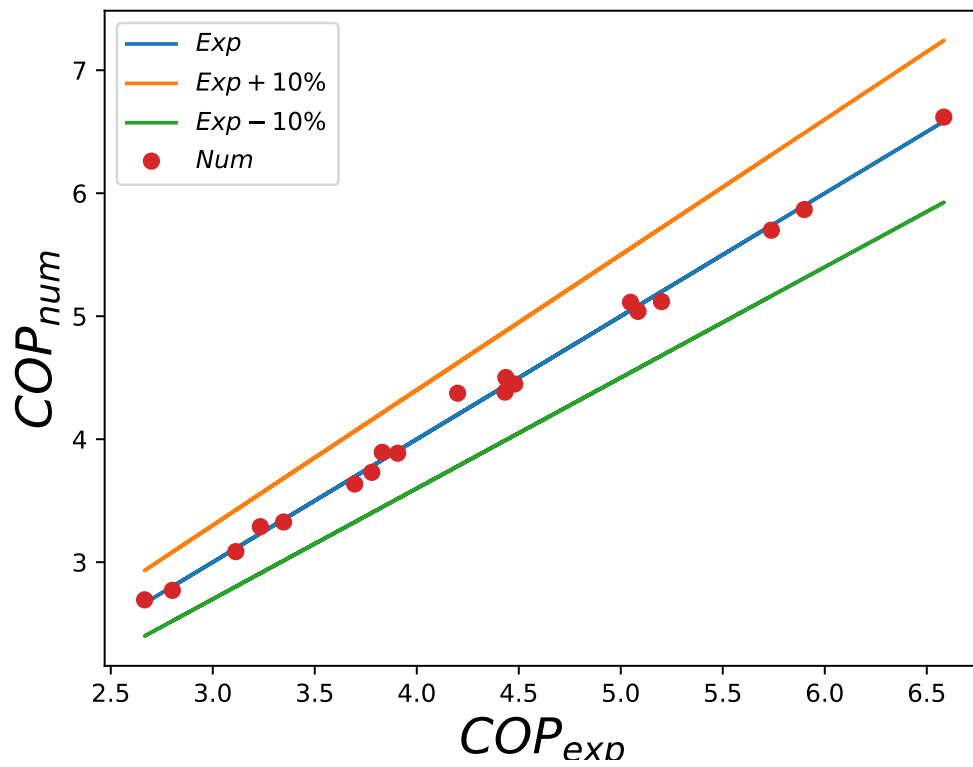


Figure 3: COP differences between experiments and fitted data