
Type977 fitting for heat pump SIN-8TU

Parametric Heat Pump calculation

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Table 1: Fitted coefficients for the heat pump.

Coefficient	Description	[kW]
P_{Q_1}	1 st condenser polynomial coefficient	7.4629e+00
P_{Q_2}	2 st condenser polynomial coefficient	8.1802e+01
P_{Q_3}	3 st condenser polynomial coefficient	2.4943e+01
P_{Q_4}	4 st condenser polynomial coefficient	-1.0992e+02
P_{Q_5}	5 st condenser polynomial coefficient	-1.8134e+01
P_{Q_6}	6 st condenser polynomial coefficient	-1.2741e+02
P_{COP_1}	1 st COP polynomial coefficient	7.3526e+00
P_{COP_2}	2 st COP polynomial coefficient	8.2053e+01
P_{COP_3}	3 st COP polynomial coefficient	-1.0997e+01
P_{COP_4}	4 st COP polynomial coefficient	-3.3950e+02
P_{COP_5}	5 st COP polynomial coefficient	-2.6884e+00
P_{COP_6}	6 st COP polynomial coefficient	-6.2924e+01
\dot{m}_{cond}	1400.00 [kg/h]	
\dot{m}_{evap}	1400.00 [kg/h]	
COP_{nom} (A0W35)	4.77	
$Q_{cond,nom}$ (A0W35)	8.00 [kW]	
$Q_{evap,nom}$ (A0W35)	6.32 [kW]	
$W_{comp,nom}$ (A0W35)	1.68 [kW]	
RMS_{COP}	$5.23e - 02$	
$RMS_{Q_{cond}}$	$1.67e - 02$	
$RMS_{W_{comp}}$	$2.65e - 02$	
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 $RMS = \sqrt{\sum \frac{(Q_{exp} - Q_{num})^2}{n_p}}$ 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	4.10	4.11	0.3	6.91	6.90	0.2	1.69	1.68	0.44
35.00	0.00	4.82	4.79	0.6	8.08	8.10	0.2	1.68	1.69	0.84
35.00	5.00	5.56	5.54	0.4	9.25	9.25	0.0	1.66	1.67	0.43
50.00	-5.00	2.95	2.91	1.3	6.43	6.43	0.1	2.18	2.21	1.39
50.00	0.00	3.36	3.29	2.1	7.52	7.50	0.3	2.24	2.28	1.78
50.00	5.00	3.80	3.73	1.7	8.61	8.58	0.3	2.27	2.30	1.34
45.00	-5.00	3.37	3.42	1.4	6.67	6.67	0.0	1.98	1.95	1.50
45.00	0.00	3.90	3.93	0.9	7.79	7.80	0.1	2.00	1.98	0.77
45.00	5.00	4.43	4.49	1.3	8.91	8.92	0.1	2.01	1.99	1.18
55.00	0.00	2.78	2.80	0.6	7.18	7.20	0.3	2.58	2.57	0.35
55.00	5.00	3.11	3.15	1.4	8.24	8.25	0.1	2.65	2.62	1.34
35.00	10.00	6.31	6.30	0.2	10.41	10.40	0.1	1.65	1.65	0.09
35.00	15.00	7.08	7.09	0.1	11.56	11.55	0.1	1.63	1.63	0.21
50.00	10.00	4.24	4.16	1.9	9.69	9.67	0.3	2.29	2.32	1.55
50.00	15.00	4.69	4.58	2.5	10.77	10.75	0.2	2.29	2.35	2.26
45.00	10.00	4.98	5.05	1.3	10.01	10.03	0.2	2.01	1.99	1.14
45.00	15.00	5.54	5.61	1.2	11.12	11.15	0.3	2.00	1.99	0.85
55.00	10.00	3.45	3.50	1.4	9.30	9.30	0.0	2.70	2.66	1.35
55.00	15.00	3.80	3.83	0.7	10.35	10.35	0.0	2.72	2.71	0.68
Sum				21.3			3.0			19.50
RMS_{COP}	5.23e - 02									
$RMS_{Q_{cond}}$	1.67e - 02									
$RMS_{W_{comp}}$	2.65e - 02									

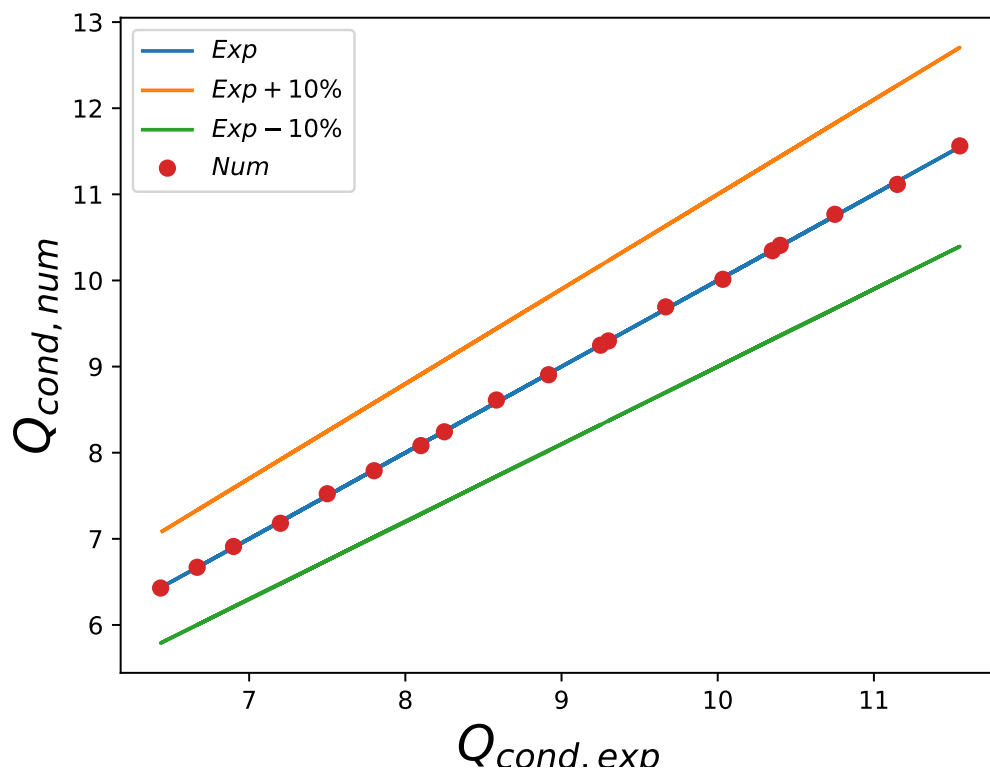


Figure 1: Q_{cond} differences between experiments and fitted data

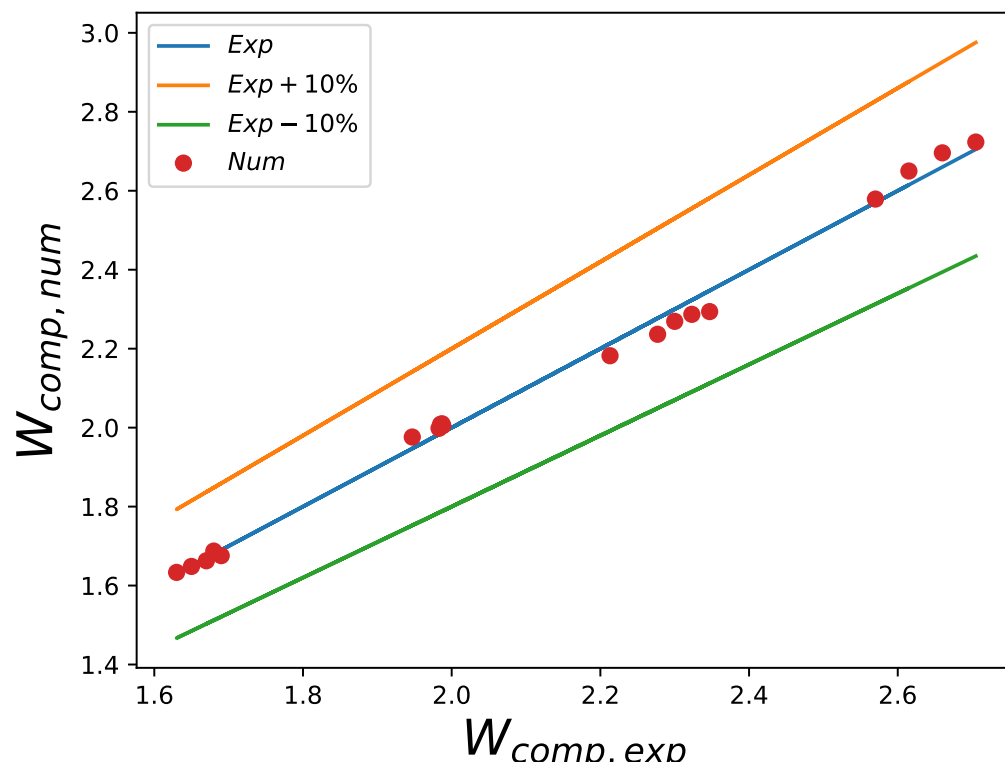


Figure 2: W_{comp} differences between experiments and fitted data

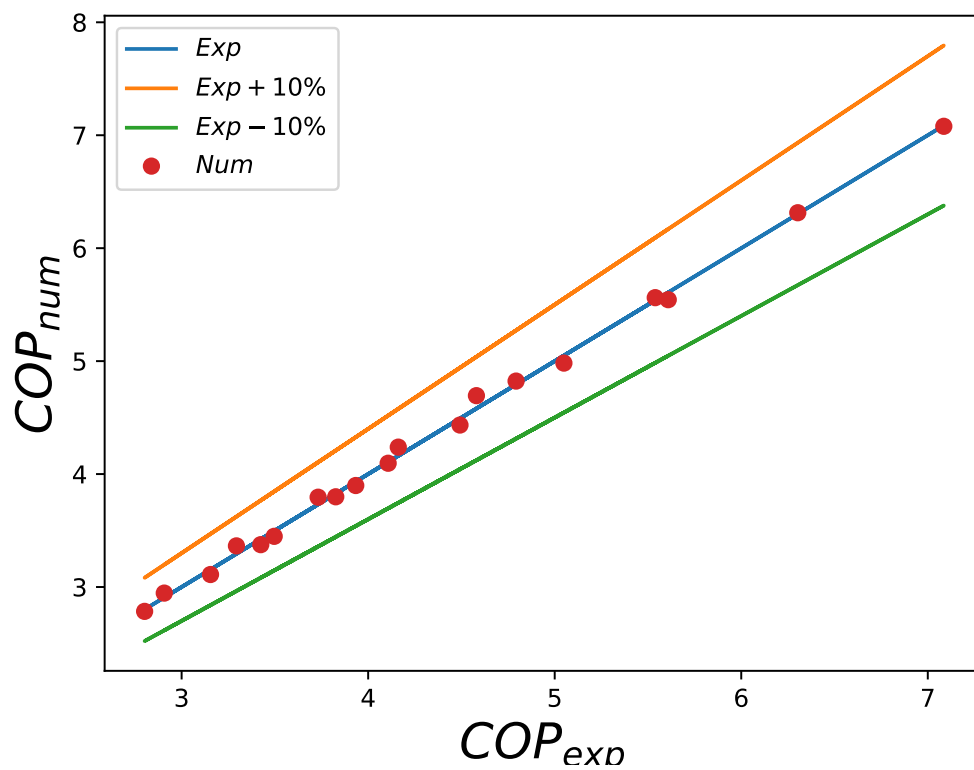


Figure 3: COP differences between experiments and fitted data