
Type977 fitting for heat pump SIN-14TU

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	1.3258e+01
P_{Q_2}	2 st condenser polynomial coefficient	1.5673e+02
P_{Q_3}	3 st condenser polynomial coefficient	3.5853e+01
P_{Q_4}	4 st condenser polynomial coefficient	-2.6116e+02
P_{Q_5}	5 st condenser polynomial coefficient	2.0242e+01
P_{Q_6}	6 st condenser polynomial coefficient	-1.8200e+02
P_{COP_1}	1 st COP polynomial coefficient	7.4744e+00
P_{COP_2}	2 st COP polynomial coefficient	8.2635e+01
P_{COP_3}	3 st COP polynomial coefficient	-9.7922e+00
P_{COP_4}	4 st COP polynomial coefficient	-3.2890e+02
P_{COP_5}	5 st COP polynomial coefficient	-6.5161e+01
P_{COP_6}	6 st COP polynomial coefficient	-6.7357e+01
\dot{m}_{cond}	2400.00 [kg/h]	
\dot{m}_{evap}	2400.00 [kg/h]	
COP_{nom} (A0W35)	4.95	
$Q_{cond,nom}$ (A0W35)	13.80 [kW]	
$Q_{evap,nom}$ (A0W35)	11.01 [kW]	
$W_{comp,nom}$ (A0W35)	2.79 [kW]	
RMS_{COP}	$5.09e - 02$	
$RMS_{Q_{cond}}$	$3.70e - 02$	
$RMS_{W_{comp}}$	$4.18e - 02$	
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	4.21	4.20	0.2	11.84	11.90	0.5	2.81	2.83	0.69
35.00	0.00	5.00	5.00	0.0	13.94	13.90	0.3	2.79	2.78	0.27
35.00	5.00	5.77	5.75	0.3	16.06	16.05	0.1	2.78	2.79	0.23
50.00	-5.00	3.05	3.00	1.5	11.32	11.30	0.1	3.71	3.76	1.34
50.00	0.00	3.54	3.49	1.5	13.22	13.17	0.4	3.73	3.77	1.07
50.00	5.00	4.01	3.94	1.9	15.14	15.12	0.2	3.77	3.84	1.74
45.00	-5.00	3.48	3.52	1.0	11.60	11.60	0.0	3.33	3.30	1.04
45.00	0.00	4.08	4.13	1.3	13.57	13.53	0.3	3.33	3.28	1.60
45.00	5.00	4.65	4.70	1.1	15.56	15.58	0.1	3.35	3.31	0.96
55.00	0.00	2.96	3.00	1.3	12.76	12.80	0.3	4.31	4.27	0.96
55.00	5.00	3.33	3.36	0.9	14.61	14.65	0.3	4.39	4.37	0.61
35.00	10.00	6.52	6.50	0.3	18.21	18.20	0.0	2.79	2.80	0.24
35.00	15.00	7.24	7.24	0.0	20.37	20.35	0.1	2.81	2.81	0.09
50.00	10.00	4.46	4.37	2.1	17.09	17.07	0.1	3.83	3.91	1.95
50.00	15.00	4.88	4.79	2.0	19.05	19.02	0.2	3.90	3.97	1.81
45.00	10.00	5.20	5.26	1.1	17.58	17.63	0.3	3.38	3.35	0.78
45.00	15.00	5.73	5.80	1.3	19.61	19.68	0.4	3.42	3.39	0.91
55.00	10.00	3.67	3.70	0.8	16.49	16.50	0.1	4.49	4.46	0.72
55.00	15.00	3.99	4.03	1.0	18.39	18.35	0.2	4.61	4.55	1.21
Sum				19.5			4.0			18.22
RMS_{COP}	5.09e - 02									
$RMS_{Q_{cond}}$	3.70e - 02									
$RMS_{W_{comp}}$	4.18e - 02									

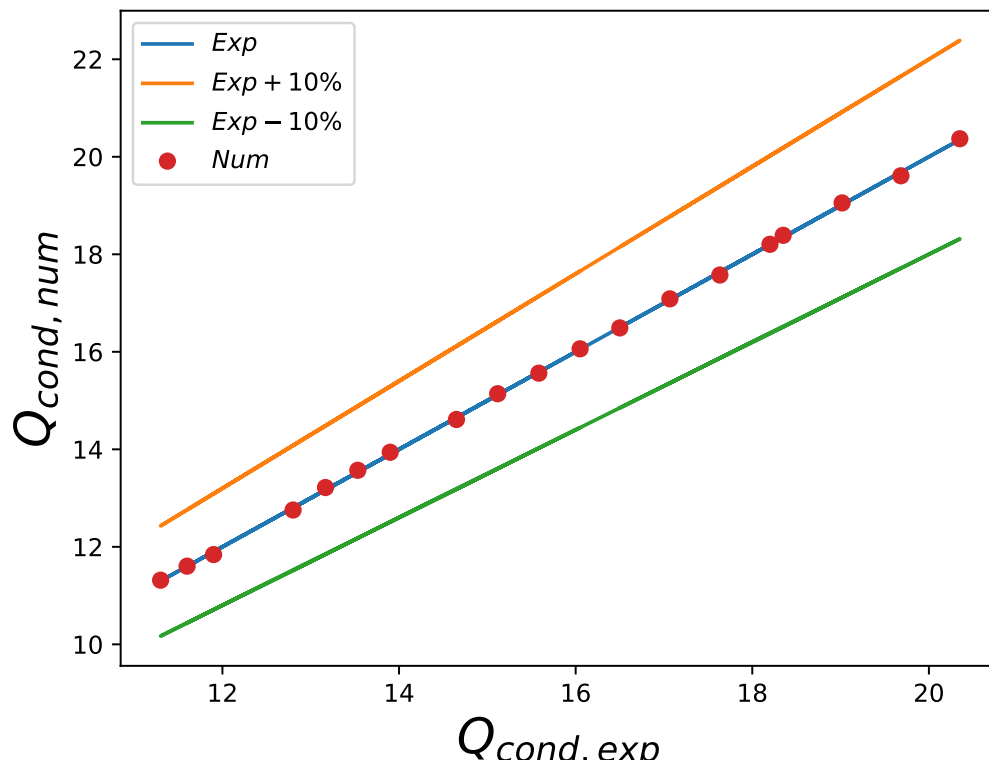


Figure 1: Q_{cond} differences between experiments and fitted data

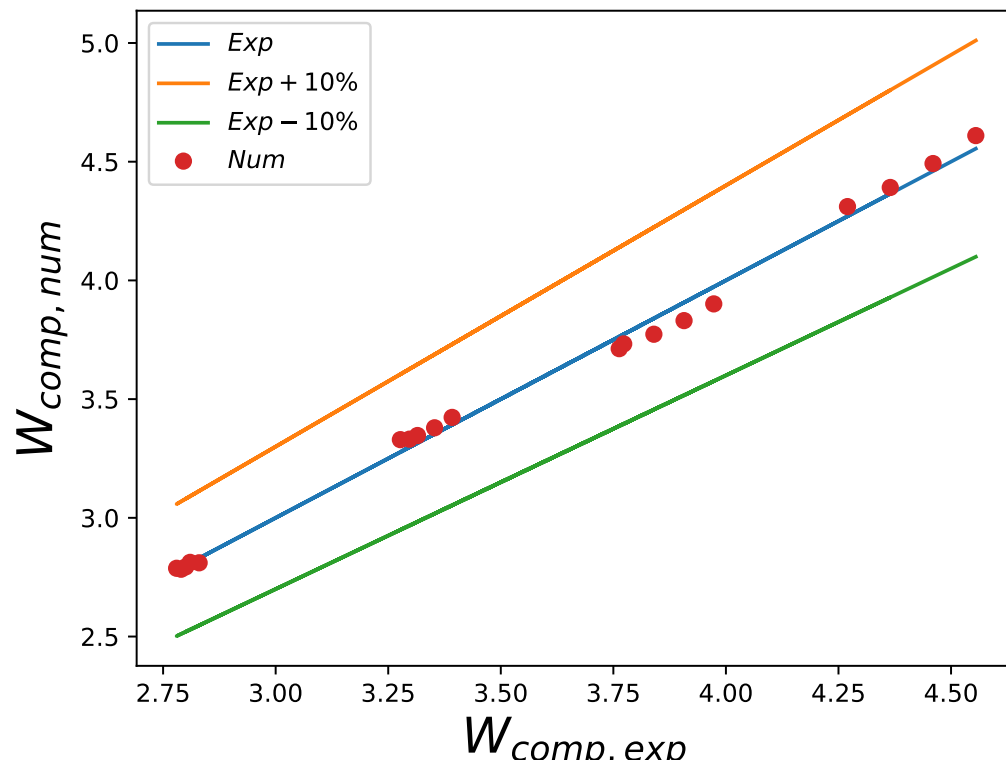


Figure 2: W_{comp} differences between experiments and fitted data

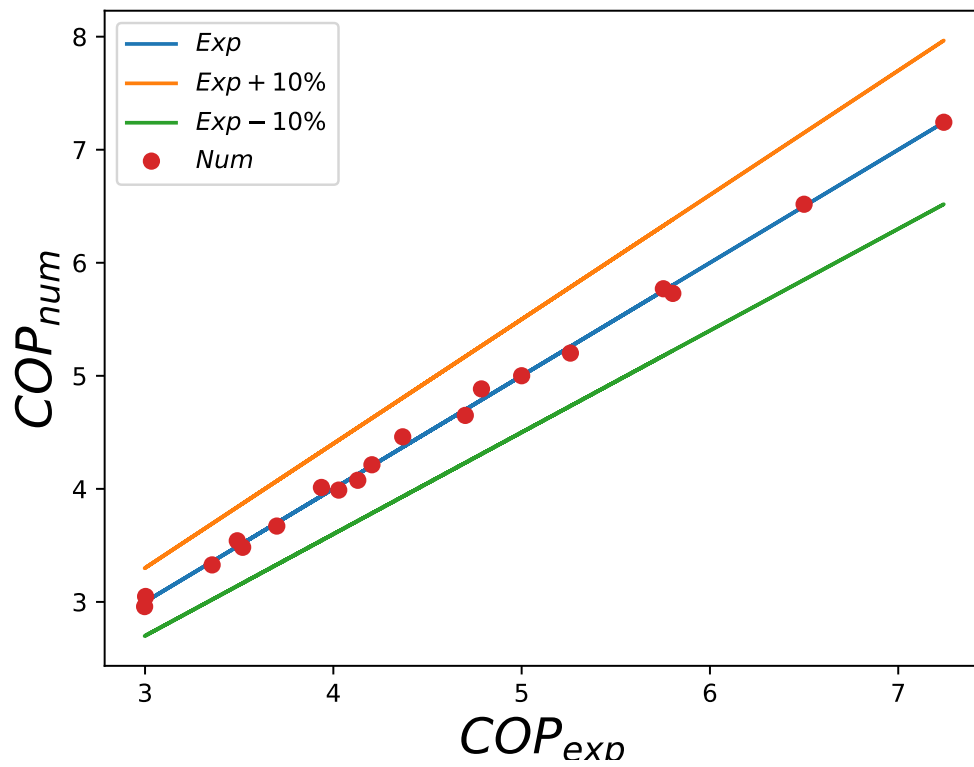


Figure 3: COP differences between experiments and fitted data