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# Type977 fitting for heat pump HP20L-WEB

## Parametric Heat Pump calculation

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Table 1: Fitted coefficients for the heat pump.

Coefficient	Description	[kW]
$P_{Q_1}$	1 <sup>st</sup> condenser polynomial coefficient	2.6787e+01
$P_{Q_2}$	2 <sup>st</sup> condenser polynomial coefficient	1.5985e+02
$P_{Q_3}$	3 <sup>st</sup> condenser polynomial coefficient	-5.7934e+01
$P_{Q_4}$	4 <sup>st</sup> condenser polynomial coefficient	5.2841e+01
$P_{Q_5}$	5 <sup>st</sup> condenser polynomial coefficient	6.2612e+02
$P_{Q_6}$	6 <sup>st</sup> condenser polynomial coefficient	6.3036e+01
$P_{COP_1}$	1 <sup>st</sup> COP polynomial coefficient	8.5612e+00
$P_{COP_2}$	2 <sup>st</sup> COP polynomial coefficient	4.5769e+01
$P_{COP_3}$	3 <sup>st</sup> COP polynomial coefficient	-4.0607e+01
$P_{COP_4}$	4 <sup>st</sup> COP polynomial coefficient	-1.2222e+02
$P_{COP_5}$	5 <sup>st</sup> COP polynomial coefficient	6.4169e+01
$P_{COP_6}$	6 <sup>st</sup> COP polynomial coefficient	4.4747e+01
$\dot{m}_{cond}$	4400.00 [kg/h]	
$\dot{m}_{evap}$	11000.00 [kg/h]	
$COP_{nom}$ (A0W35)	4.08	
$Q_{cond,nom}$ (A0W35)	19.32 [kW]	
$Q_{evap,nom}$ (A0W35)	14.59 [kW]	
$W_{comp,nom}$ (A0W35)	4.73 [kW]	
$RMS_{COP}$	$7.99e - 02$	
$RMS_{Q_{cond}}$	$4.16e - 01$	
$RMS_{W_{comp}}$	$6.33e - 02$	
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	20.00	6.54	6.48	0.8	32.95	32.80	0.5	5.04	5.06	0.37
35.00	10.00	5.23	5.30	1.3	25.59	25.71	0.5	4.89	4.85	0.87
35.00	7.00	4.88	5.03	3.0	23.65	24.46	3.3	4.84	4.86	0.37
35.00	2.00	4.28	4.11	4.1	20.60	19.80	4.0	4.82	4.82	0.07
35.00	-7.00	3.36	3.30	1.6	16.05	15.86	1.2	4.78	4.80	0.43
35.00	-15.00	2.65	2.71	2.2	12.97	13.07	0.8	4.90	4.83	1.47
45.00	7.00	3.79	3.85	1.6	22.39	23.00	2.6	5.91	5.97	1.08
45.00	2.00	3.27	3.16	3.5	19.31	18.82	2.6	5.90	5.95	0.90
45.00	-7.00	2.49	2.44	2.0	14.66	14.63	0.2	5.89	5.99	1.75
45.00	-15.00	1.91	1.96	2.7	11.50	11.89	3.3	6.03	6.07	0.59
50.00	20.00	4.65	4.68	0.6	31.32	31.30	0.1	6.73	6.69	0.63
50.00	15.00	4.09	4.09	0.1	27.42	27.00	1.5	6.71	6.60	1.69
50.00	7.00	3.29	3.41	3.4	21.84	22.35	2.3	6.64	6.56	1.20
50.00	2.00	2.82	2.78	1.3	18.74	18.32	2.3	6.66	6.59	0.99
50.00	-7.00	2.10	2.06	1.9	14.04	13.80	1.8	6.69	6.70	0.11
55.00	20.00	4.08	4.00	2.1	30.89	30.80	0.3	7.57	7.70	1.74
55.00	7.00	2.82	2.89	2.3	21.35	21.86	2.3	7.57	7.57	0.01
55.00	-7.00	1.74	1.73	0.8	13.49	13.30	1.4	7.76	7.71	0.62
Sum				35.4			31.0			14.89
$RMS_{COP}$	7.99e - 02									
$RMS_{Q_{cond}}$	4.16e - 01									
$RMS_{W_{comp}}$	6.33e - 02									

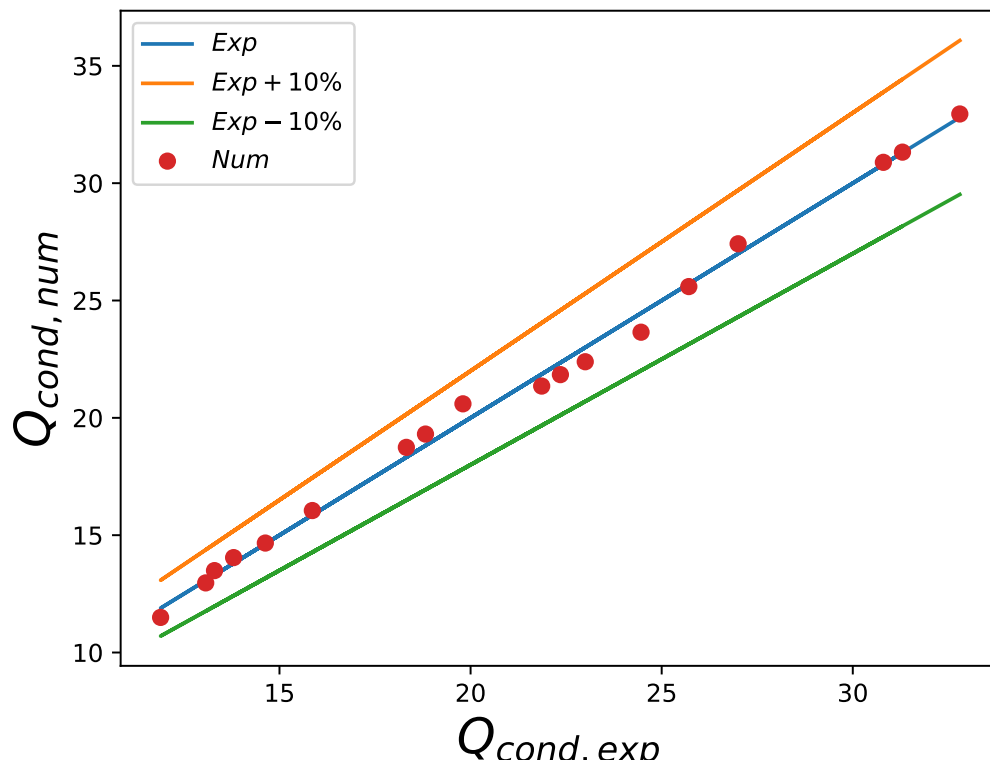


Figure 1:  $Q_{cond}$  differences between experiments and fitted data

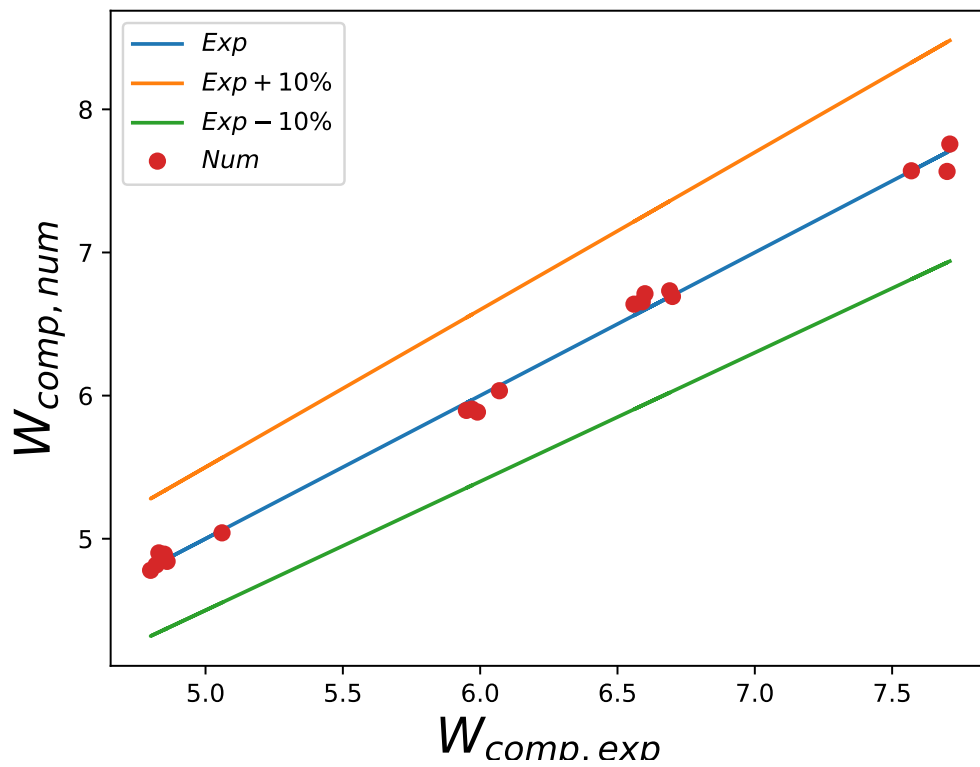


Figure 2:  $W_{comp}$  differences between experiments and fitted data

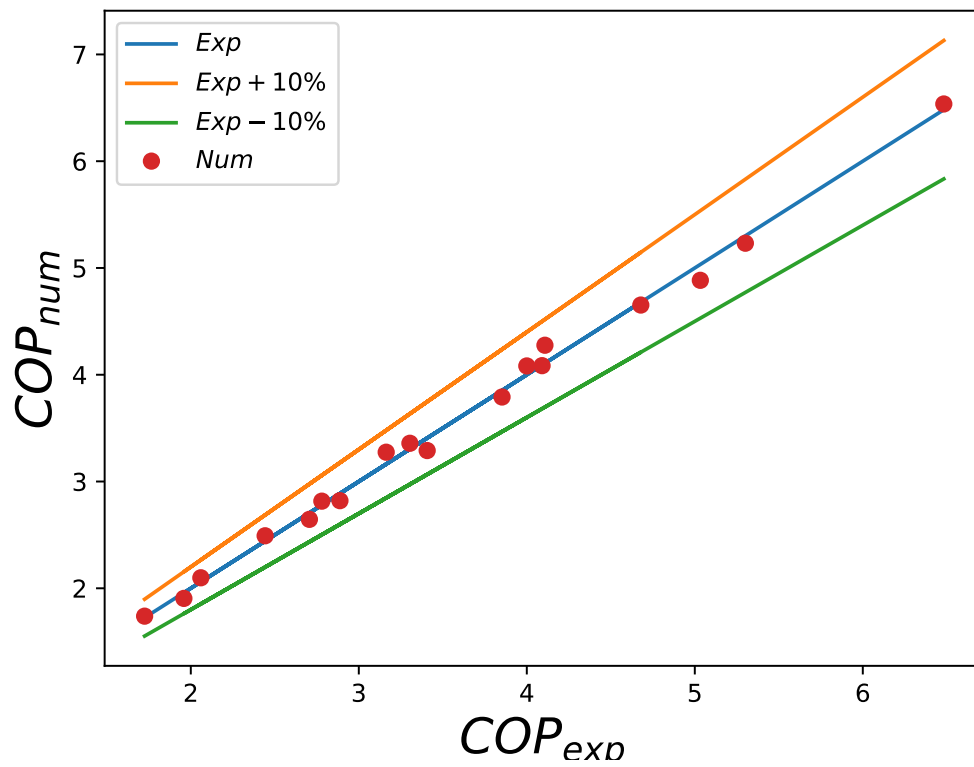


Figure 3:  $COP$  differences between experiments and fitted data