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# Type977 fitting for heat pump HP30L-M-WEB

## Parametric Heat Pump calculation

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Dani Carbonell  
[dani.carbonell@spf.ch](mailto:dani.carbonell@spf.ch)

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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	4.1854e+01
$P_{Q_2}$	2 <sup>st</sup> condenser polynomial coefficient	2.7234e+02
$P_{Q_3}$	3 <sup>st</sup> condenser polynomial coefficient	-3.0235e+01
$P_{Q_4}$	4 <sup>st</sup> condenser polynomial coefficient	3.3505e+01
$P_{Q_5}$	5 <sup>st</sup> condenser polynomial coefficient	7.7189e+01
$P_{Q_6}$	6 <sup>st</sup> condenser polynomial coefficient	-1.5104e+02
$P_{COP_1}$	1 <sup>st</sup> COP polynomial coefficient	1.0074e+01
$P_{COP_2}$	2 <sup>st</sup> COP polynomial coefficient	4.8898e+01
$P_{COP_3}$	3 <sup>st</sup> COP polynomial coefficient	-6.1964e+01
$P_{COP_4}$	4 <sup>st</sup> COP polynomial coefficient	-1.5923e+02
$P_{COP_5}$	5 <sup>st</sup> COP polynomial coefficient	3.6790e+01
$P_{COP_6}$	6 <sup>st</sup> COP polynomial coefficient	1.1997e+02
$\dot{m}_{cond}$	4700.00 [kg/h]	
$\dot{m}_{evap}$	11750.00 [kg/h]	
$COP_{nom}$ (A0W35)	4.13	
$Q_{cond,nom}$ (A0W35)	33.60 [kW]	
$Q_{evap,nom}$ (A0W35)	25.46 [kW]	
$W_{comp,nom}$ (A0W35)	8.14 [kW]	
$RMS_{COP}$	1.16e - 01	
$RMS_{Q_{cond}}$	1.25e + 00	
$RMS_{W_{comp}}$	1.35e - 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	20.00	6.41	6.37	0.6	51.45	50.57	1.7	8.03	7.94	1.10
35.00	10.00	5.25	5.34	1.7	42.23	43.25	2.3	8.05	8.10	0.62
35.00	7.00	4.93	5.12	3.7	39.51	41.56	4.9	8.02	8.12	1.25
35.00	2.00	4.29	4.06	5.6	34.79	32.85	5.9	8.12	8.09	0.32
35.00	-7.00	3.39	3.28	3.2	26.65	25.68	3.8	7.86	7.82	0.57
35.00	-15.00	2.66	2.71	1.7	19.50	19.92	2.1	7.32	7.35	0.44
45.00	7.00	3.77	3.92	3.8	37.40	39.06	4.2	9.91	9.96	0.49
45.00	2.00	3.27	3.15	4.0	32.64	30.88	5.7	9.97	9.81	1.64
45.00	-7.00	2.56	2.56	0.2	24.43	23.91	2.2	9.53	9.34	1.99
45.00	-15.00	2.01	2.14	6.1	17.21	18.56	7.3	8.58	8.69	1.29
50.00	20.00	4.42	4.28	3.1	48.31	47.56	1.6	10.93	11.10	1.51
50.00	15.00	4.00	4.05	1.2	43.69	44.90	2.7	10.93	11.10	1.53
50.00	7.00	3.31	3.40	2.6	36.20	37.32	3.0	10.93	10.97	0.37
50.00	2.00	2.88	2.74	5.0	31.42	29.55	6.3	10.90	10.77	1.24
50.00	-7.00	2.27	2.22	2.1	23.15	22.62	2.4	10.22	10.19	0.30
55.00	20.00	3.91	3.92	0.2	47.10	46.46	1.4	12.03	11.85	1.54
55.00	7.00	2.94	3.09	4.8	34.93	36.22	3.6	11.88	11.73	1.28
55.00	-7.00	2.05	1.97	4.1	21.77	21.52	1.1	10.64	10.95	2.83
Sum				53.7			62.3			20.30
$RMS_{COP}$	1.16e - 01									
$RMS_{Q_{cond}}$	1.25e + 00									
$RMS_{W_{comp}}$	1.35e - 01									

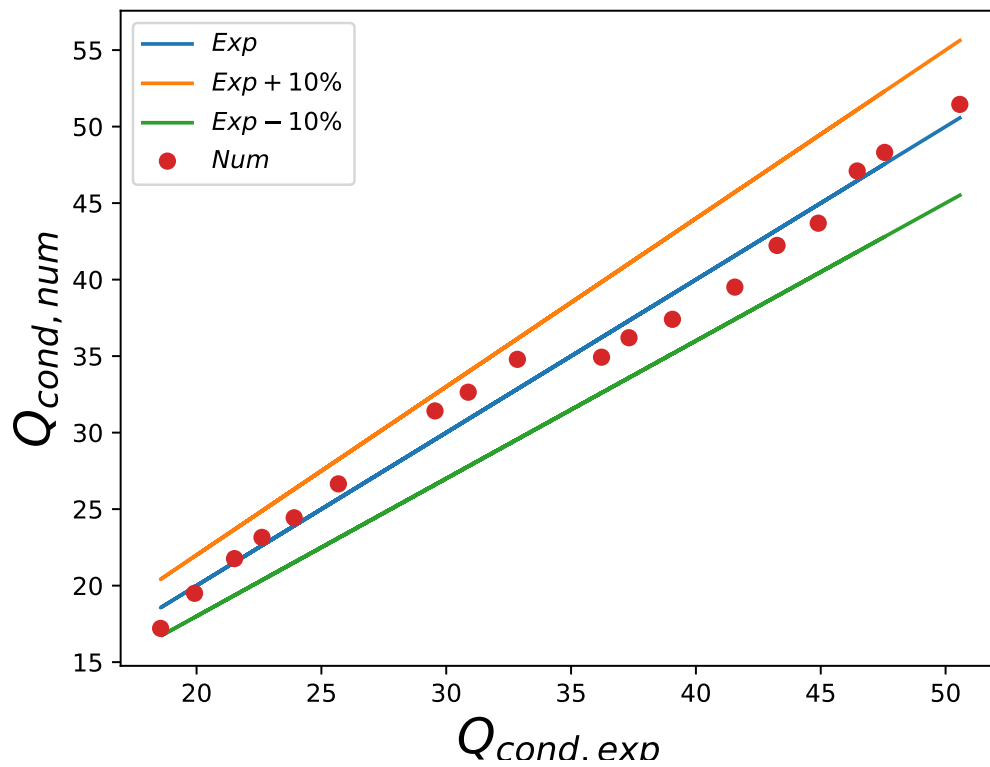


Figure 1:  $Q_{cond}$  differences between experiments and fitted data

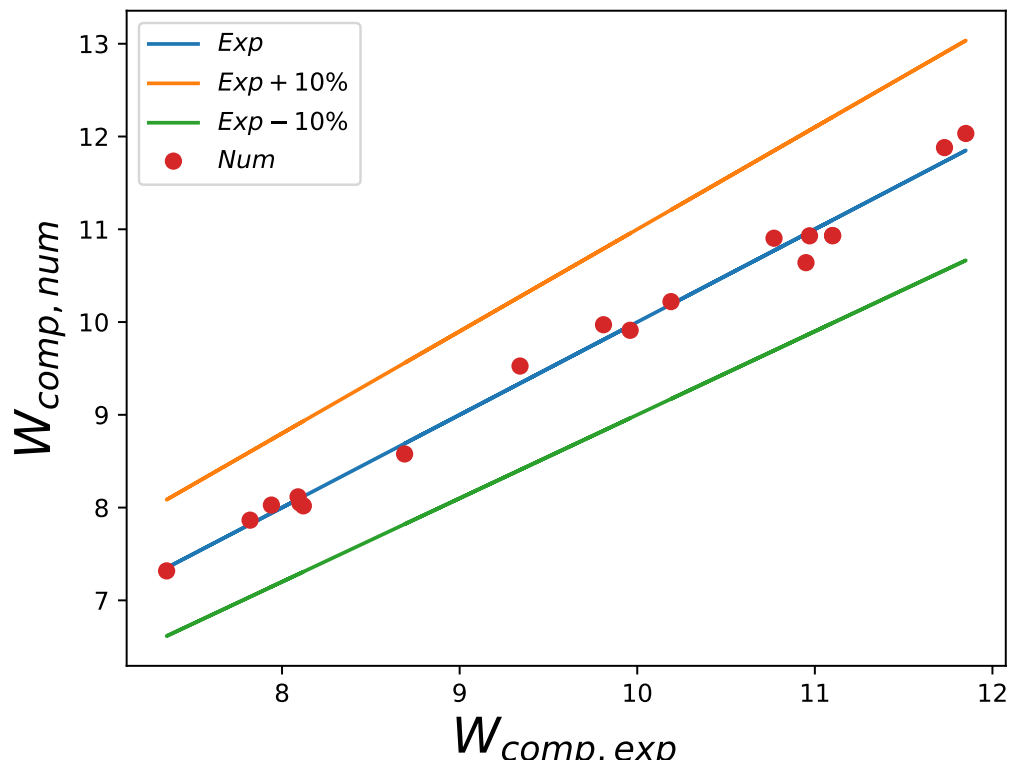


Figure 2:  $W_{comp}$  differences between experiments and fitted data

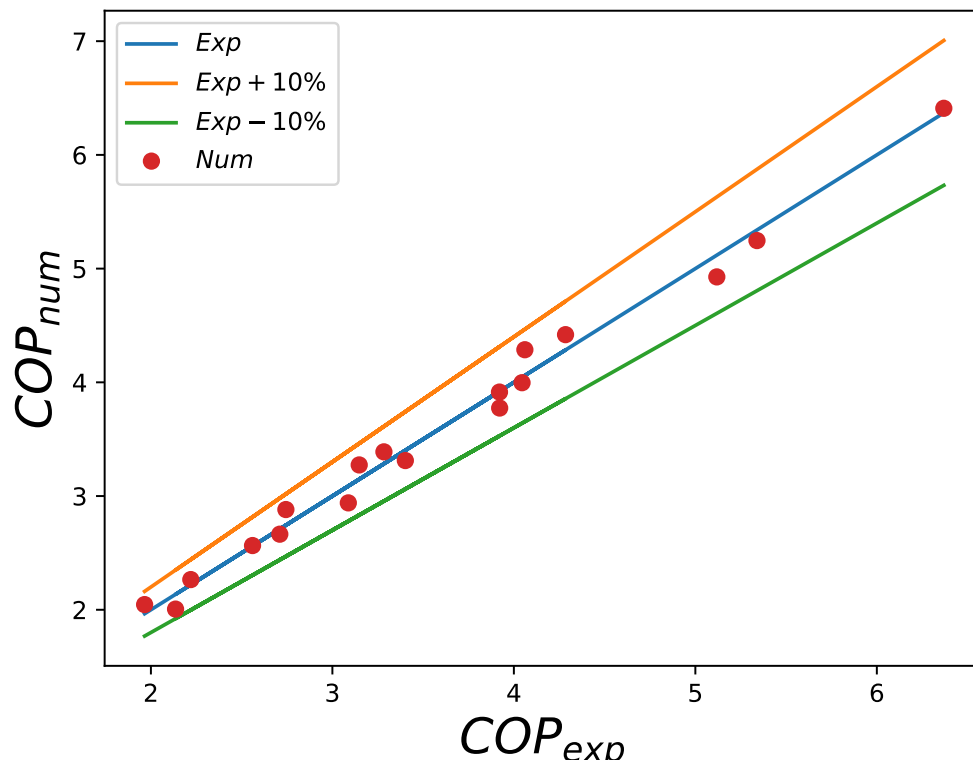


Figure 3:  $COP$  differences between experiments and fitted data