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# Type977 fitting for heat pump HP08L-K-BC

## 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	7.1081e+00
$P_{Q_2}$	2 <sup>st</sup> condenser polynomial coefficient	6.4049e+01
$P_{Q_3}$	3 <sup>st</sup> condenser polynomial coefficient	3.1445e+01
$P_{Q_4}$	4 <sup>st</sup> condenser polynomial coefficient	1.6814e+01
$P_{Q_5}$	5 <sup>st</sup> condenser polynomial coefficient	5.7808e+01
$P_{Q_6}$	6 <sup>st</sup> condenser polynomial coefficient	-1.7193e+02
$P_{COP_1}$	1 <sup>st</sup> COP polynomial coefficient	7.7795e+00
$P_{COP_2}$	2 <sup>st</sup> COP polynomial coefficient	6.1523e+01
$P_{COP_3}$	3 <sup>st</sup> COP polynomial coefficient	-2.9184e+01
$P_{COP_4}$	4 <sup>st</sup> COP polynomial coefficient	-2.1983e+02
$P_{COP_5}$	5 <sup>st</sup> COP polynomial coefficient	6.0715e+01
$P_{COP_6}$	6 <sup>st</sup> COP polynomial coefficient	3.8932e+00
$\dot{m}_{cond}$	1600.00 [kg/h]	
$\dot{m}_{evap}$	4000.00 [kg/h]	
$COP_{nom}$ (A0W35)	4.04	
$Q_{cond,nom}$ (A0W35)	7.82 [kW]	
$Q_{evap,nom}$ (A0W35)	5.88 [kW]	
$W_{comp,nom}$ (A0W35)	1.93 [kW]	
$RMS_{COP}$	$9.72e - 02$	
$RMS_{Q_{cond}}$	$1.95e - 01$	
$RMS_{W_{comp}}$	$4.91e - 02$	
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	6.77	6.85	1.2	12.51	12.47	0.3	1.85	1.82	1.53
35.00	10.00	5.33	5.28	1.0	10.14	10.24	1.0	1.90	1.94	2.01
35.00	7.00	4.94	5.01	1.5	9.45	9.67	2.3	1.91	1.93	0.85
35.00	2.00	4.27	4.09	4.3	8.31	7.98	4.1	1.95	1.95	0.17
35.00	-7.00	3.24	3.23	0.2	6.35	6.27	1.3	1.96	1.94	1.09
35.00	-15.00	2.43	2.53	4.1	4.69	4.82	2.6	1.93	1.90	1.59
45.00	7.00	3.80	3.79	0.2	8.96	9.10	1.5	2.36	2.40	1.79
45.00	2.00	3.27	3.15	3.9	7.79	7.50	3.8	2.38	2.38	0.04
45.00	-7.00	2.48	2.45	1.5	5.78	5.70	1.5	2.33	2.33	0.00
45.00	-15.00	1.89	1.89	0.0	4.08	4.23	3.6	2.16	2.24	3.56
50.00	20.00	4.55	4.45	2.2	11.71	11.56	1.3	2.58	2.60	0.90
50.00	15.00	4.03	4.15	2.9	10.49	10.80	2.8	2.60	2.60	0.03
50.00	7.00	3.24	3.44	5.6	8.56	8.83	3.0	2.64	2.57	2.75
50.00	2.00	2.78	2.79	0.4	7.37	7.14	3.2	2.65	2.56	3.65
50.00	-7.00	2.10	2.10	0.3	5.33	5.24	1.8	2.54	2.50	1.52
55.00	20.00	3.80	3.69	3.0	11.24	11.03	1.9	2.96	2.99	1.13
55.00	7.00	2.67	2.79	4.4	8.05	8.30	3.0	3.01	2.97	1.49
55.00	-7.00	1.72	1.63	5.4	4.77	4.71	1.4	2.78	2.89	3.85
Sum				42.2			40.5			27.95
$RMS_{COP}$	9.72e - 02									
$RMS_{Q_{cond}}$	1.95e - 01									
$RMS_{W_{comp}}$	4.91e - 02									

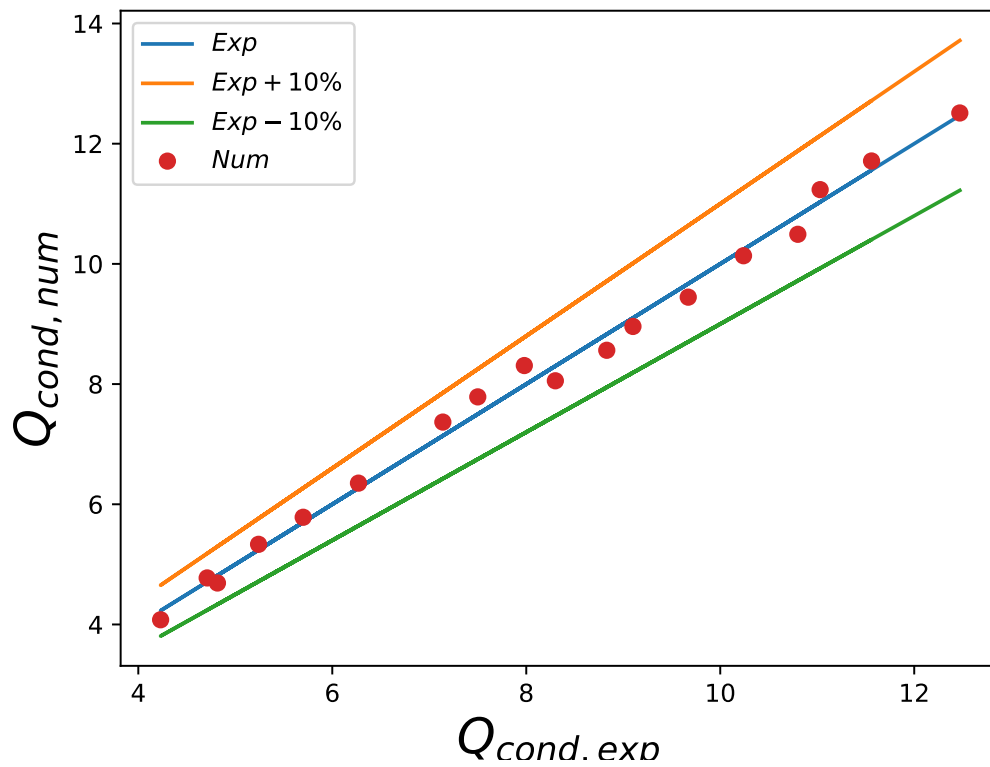


Figure 1:  $Q_{cond}$  differences between experiments and fitted data

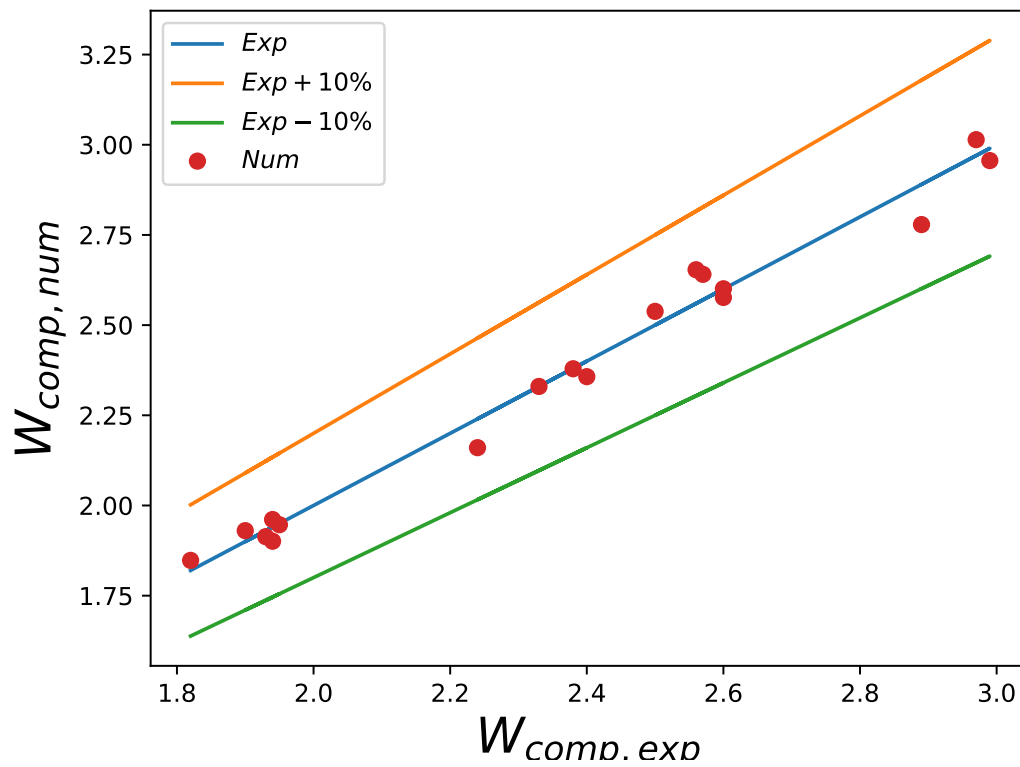


Figure 2:  $W_{comp}$  differences between experiments and fitted data

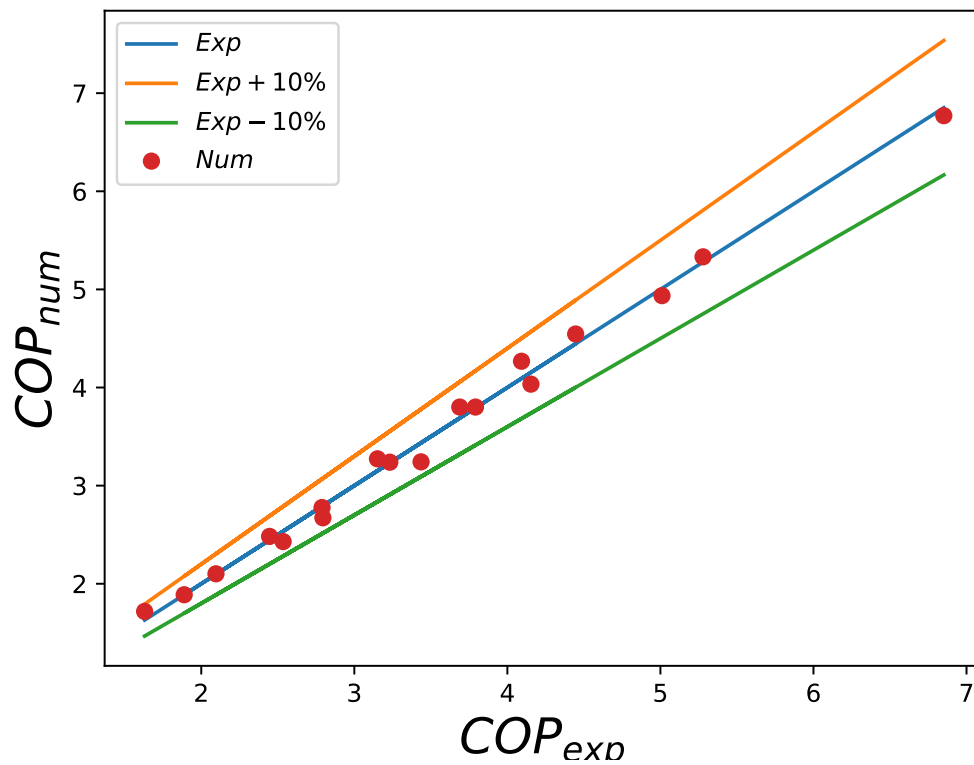


Figure 3:  $COP$  differences between experiments and fitted data