

SUPPLEMENTARY MATERIAL

Table S1 Pump model Database

The database encompasses the following parameters characterizing the performance curves of each pump model:

- η_0 : Maximum efficiency of the pump model.
- H_1 , A , B : Coefficients pertaining to the head curve of each pump model.
- $Q_{b,max}$: Upper limit of the pump model's flow capacity.
- Q_0 : Standard flow rate associated with each pump model in the best efficient point.
- H_0 : Standard head value for each pump model in the best efficient point.
- E , F : Coefficients related to the efficiency curve of each pump model.
- Cost: This cost includes both the pump's purchase price and installation expenses.

N° Model	η_0	H_1 (m)	A	B	$Q_{b,max}$	Q_0 (L/s)	H_0 (m)	E	F	Cost (€)
1	56.00%	26.17	0.24	2	10.52	5.26	19.63	0.2128	0.0202	2361.83
2	47.00%	22.83	0.28	2	9.02	4.51	17.12	0.2084	0.0231	2442.90
3	50.00%	27.75	0.28	2	10.00	5.00	20.81	0.2000	0.0200	2534.86
4	56.00%	37.00	0.27	2	11.72	5.86	27.75	0.1912	0.0163	2644.97
5	58.00%	42.53	0.27	2	12.54	6.27	31.89	0.1851	0.0148	2742.98
6	50.00%	48.30	0.37	2	11.44	5.72	36.23	0.1748	0.0153	3154.38
7	53.00%	55.85	0.27	2	14.41	7.20	41.89	0.1472	0.0102	3468.98
8	54.00%	68.65	0.29	2	15.51	7.75	51.49	0.1393	0.0090	3703.72
9	39.00%	69.79	0.20	2	18.73	9.36	52.34	0.0833	0.0044	5450.96
10	43.00%	92.35	0.25	2	19.29	9.65	69.26	0.0891	0.0046	5862.36
11	45.00%	102.75	0.23	2	21.18	10.59	77.06	0.0850	0.0040	6202.37
12	78.00%	26.92	0.04	2	25.14	12.57	20.19	0.1241	0.0049	2896.65
13	52.50%	27.99	0.10	2	17.04	8.52	20.99	0.1232	0.0072	2884.55
14	62.50%	33.86	0.08	2	21.17	10.58	25.39	0.1181	0.0056	3005.55
15	66.20%	42.59	0.07	2	24.68	12.34	31.94	0.1073	0.0043	3496.81
16	56.00%	41.33	0.17	2	15.59	7.79	31.00	0.1437	0.0092	3718.24
17	59.00%	56.51	0.12	2	21.37	10.68	42.39	0.1104	0.0052	3965.08
18	61.00%	67.73	0.11	2	24.27	12.14	50.80	0.1005	0.0041	4988.74
19	49.00%	59.30	0.11	2	23.49	11.74	44.48	0.0834	0.0036	5544.13
20	53.00%	75.21	0.12	2	25.40	12.70	56.41	0.0835	0.0033	5954.32
21	55.00%	100.47	0.11	2	30.18	15.09	75.35	0.0729	0.0024	7042.11
22	73.00%	15.77	0.02	2	29.86	14.93	11.83	0.0978	0.0033	2598.99
23	74.00%	19.13	0.02	2	33.03	16.52	14.35	0.0896	0.0027	2819.21
24	75.50%	23.49	0.01	2	42.86	21.43	17.61	0.0705	0.0016	2952.31
25	76.00%	27.26	0.01	2	43.87	21.94	20.45	0.0693	0.0016	3539.16
26	74.00%	29.42	0.02	2	37.55	18.77	22.06	0.0788	0.0021	3831.98
27	76.00%	38.08	0.02	2	42.64	21.32	28.56	0.0713	0.0017	4152.63
28	76.50%	43.63	0.02	2	48.50	24.25	32.72	0.0631	0.0013	4882.26
29	68.00%	55.49	0.05	2	34.78	17.39	41.61	0.0782	0.0022	5050.45
30	69.50%	63.54	0.04	2	38.94	19.47	47.65	0.0714	0.0018	5459.43
31	70.00%	67.24	0.04	2	38.70	19.35	50.43	0.0723	0.0019	5805.49

N° Model	η_0	H ₁ (m)	A	B	Q _{b,max}	Q ₀ (L/s)	H ₀ (m)	E	F	Cost (€)
32	61.00%	81.41	0.04	2	45.42	22.71	61.06	0.0537	0.0012	7056.63
33	63.00%	104.98	0.04	2	48.63	24.32	78.73	0.0518	0.0011	9356.84
34	70.00%	20.50	0.23	2	9.42	4.71	15.38	0.2973	0.0316	3637.17
35	73.00%	22.83	0.20	2	10.59	5.30	17.13	0.2756	0.0260	3917.89
36	76.00%	26.81	0.19	2	11.99	5.99	20.11	0.2536	0.0212	4884.68
37	76.00%	33.36	0.26	2	11.32	5.66	25.02	0.2687	0.0237	4997.21
38	81.00%	44.44	0.26	2	12.99	6.50	33.33	0.2494	0.0192	5407.40
39	72.00%	41.29	0.28	2	12.17	6.09	30.97	0.2366	0.0194	5667.55
40	73.50%	49.14	0.24	2	14.27	7.14	36.85	0.2060	0.0144	6009.98
41	75.00%	55.03	0.28	2	14.13	7.07	41.27	0.2123	0.0150	7048.16
42	77.00%	68.92	0.27	2	15.97	7.99	51.69	0.1928	0.0121	9053.13
43	73.00%	82.74	0.32	2	16.16	8.08	62.06	0.1807	0.0112	9278.19
44	75.00%	93.45	0.31	2	17.41	8.71	70.09	0.1723	0.0099	9552.86
45	77.00%	104.25	0.32	2	18.11	9.06	78.19	0.1701	0.0094	11157.32
46	75.00%	26.58	0.10	2	16.61	8.31	19.93	0.1806	0.0109	5225.90
47	78.00%	33.16	0.12	2	16.57	8.29	24.87	0.1883	0.0114	5637.30
48	82.00%	34.83	0.08	2	20.48	10.24	26.12	0.1601	0.0078	5979.73
49	84.00%	39.62	0.08	2	21.96	10.98	29.71	0.1530	0.0070	6725.09
50	78.00%	49.06	0.14	2	18.79	9.40	36.79	0.1660	0.0088	7230.87
51	79.00%	54.18	0.12	2	21.06	10.53	40.64	0.1501	0.0071	9297.55
52	80.00%	59.61	0.10	2	23.83	11.92	44.71	0.1343	0.0056	9655.71
53	80.50%	65.69	0.10	2	25.38	12.69	49.27	0.1269	0.0050	10845.14
54	82.00%	73.46	0.19	2	19.63	9.82	55.09	0.1670	0.0085	11260.17
55	82.00%	86.11	0.14	2	24.78	12.39	64.58	0.1324	0.0053	13745.51
56	80.00%	100.97	0.14	2	26.83	13.41	75.73	0.1193	0.0044	16492.21
57	78.00%	41.57	0.07	2	23.57	11.78	31.18	0.1324	0.0056	7627.75
58	80.50%	48.18	0.06	2	28.01	14.00	36.14	0.1150	0.0041	9405.24
59	81.50%	53.70	0.06	2	29.91	14.96	40.28	0.1090	0.0036	9758.56
60	82.50%	59.98	0.05	2	33.28	16.64	44.99	0.0992	0.0030	11108.92
61	83.00%	65.09	0.04	2	38.31	19.16	48.81	0.0867	0.0023	13597.89
62	82.50%	62.74	0.10	2	25.05	12.53	47.06	0.1317	0.0053	11365.44
63	82.75%	71.69	0.08	2	29.72	14.86	53.77	0.1114	0.0037	14119.40
64	83.00%	82.03	0.07	2	33.94	16.97	61.52	0.0978	0.0029	16866.10
65	70.00%	44.54	0.02	2	50.74	25.37	33.41	0.0552	0.0011	11490.07
66	72.00%	49.37	0.02	2	50.45	25.23	37.03	0.0571	0.0011	13486.57
67	74.00%	54.58	0.02	2	48.27	24.13	40.93	0.0613	0.0013	17258.14