ES ENERGY SAVE

Performance Curves

ES M R290 Series

ES M8 R290

ES M12 R290

ES M15 R290 1 PH ES

M15 R290 3 PH

V2.0 2026-04-15

Table of Contents

1 Document History

Version	Release	Version Information
1.0	April 1, 2025	First release
2.0	April 15, 2026	Design update

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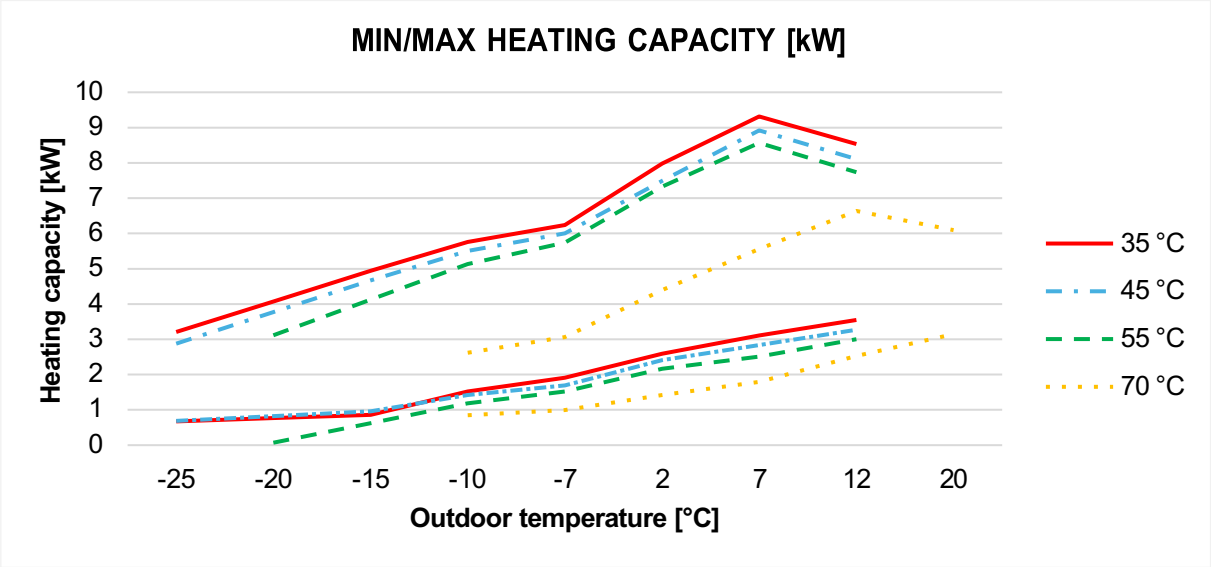
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Heating capacity [kW]
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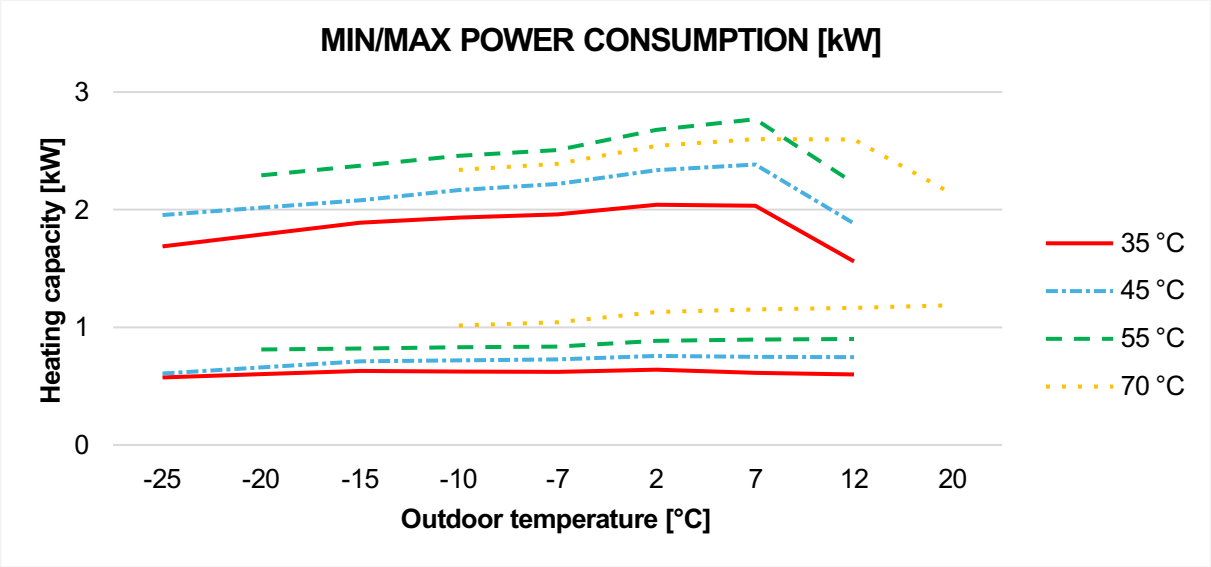
8
7
6
5
4
3
2
1
0
-25
-20
-15
-10
-7
2
7
12
20
Outdoor temperature [°C]
35 °C
45 °C
55 °C
70 °C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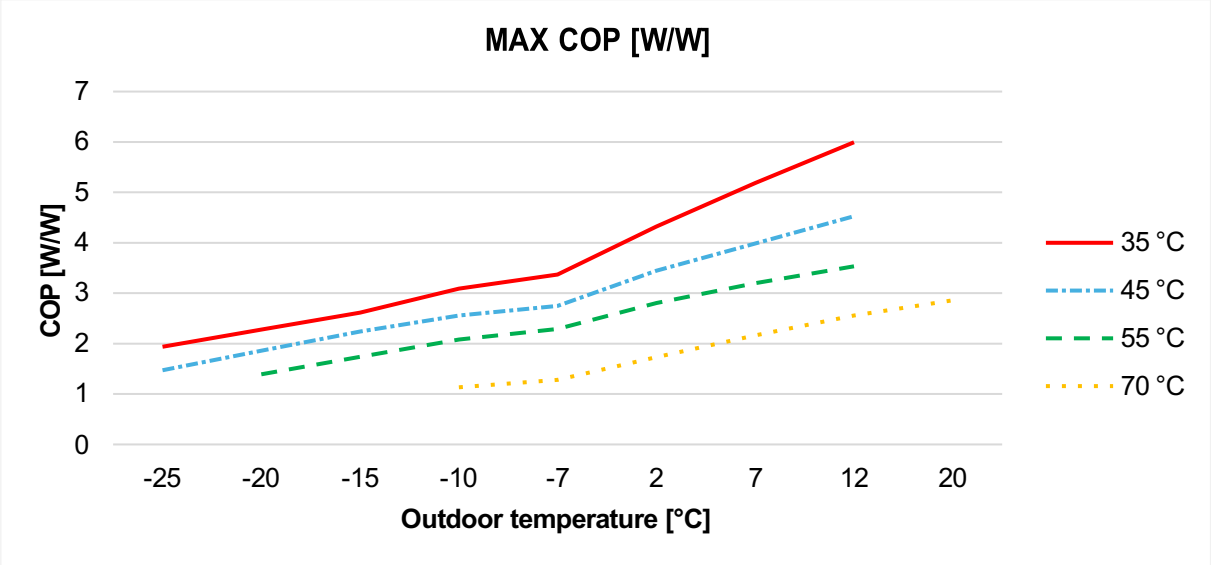
12
20
Outdoor temperature [°C]
35 °C
45 °C
55 °C
70 °C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COP [W/W]
7
6
5
4
3
2
1
0
-25
-20
-15
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-7
2
7
12
20
Outdoor temperature [°C]
35 °C
45 °C
55 °C
70 °C

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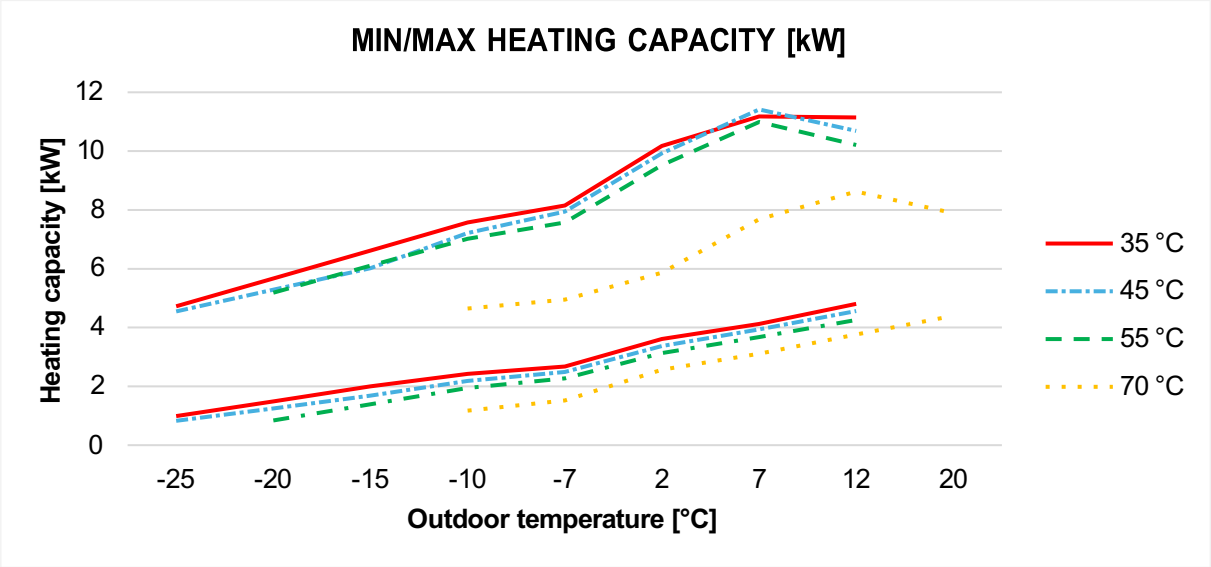
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Heating capacity [kW]
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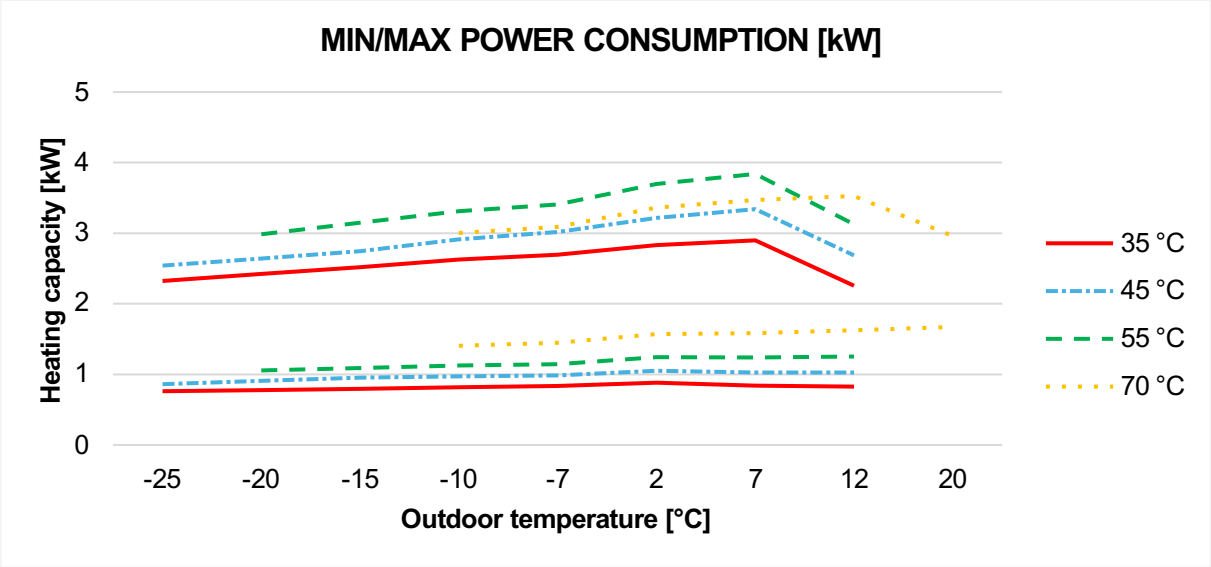
2
7
12
20
Outdoor temperature [°C]
35 °C
45 °C
55 °C
70 °C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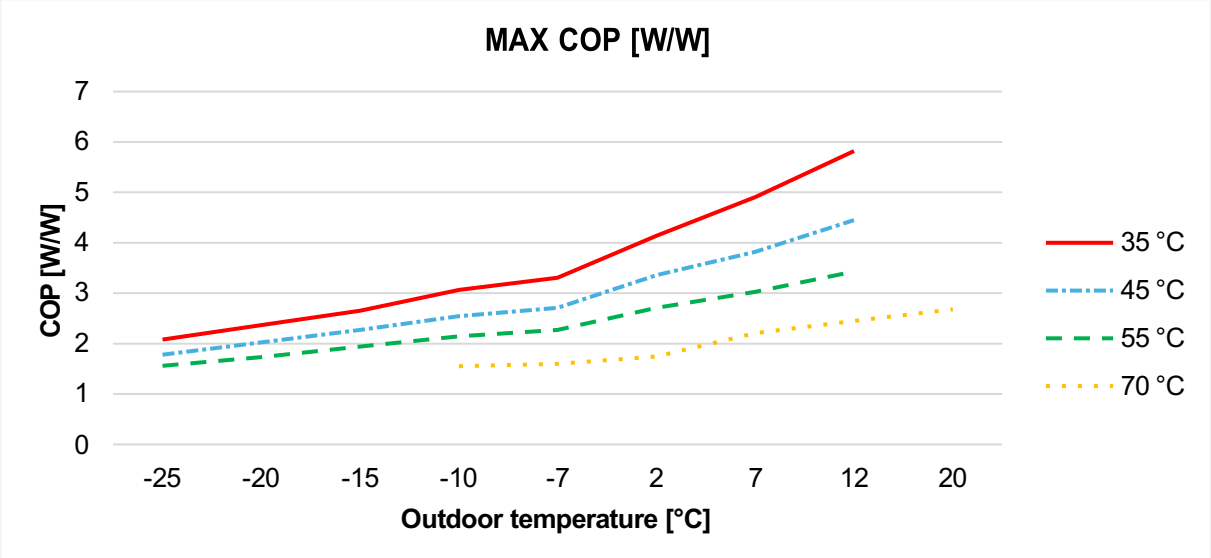
2
7
12
20
Outdoor temperature [°C]
35 °C
45 °C
55 °C
70 °C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COP [W/W]
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6
5
4
3
2
1
0
-25
-20
-15
-10
-7
2
7
12
20
Outdoor temperature [°C]
35 °C
45 °C
55 °C
70 °C

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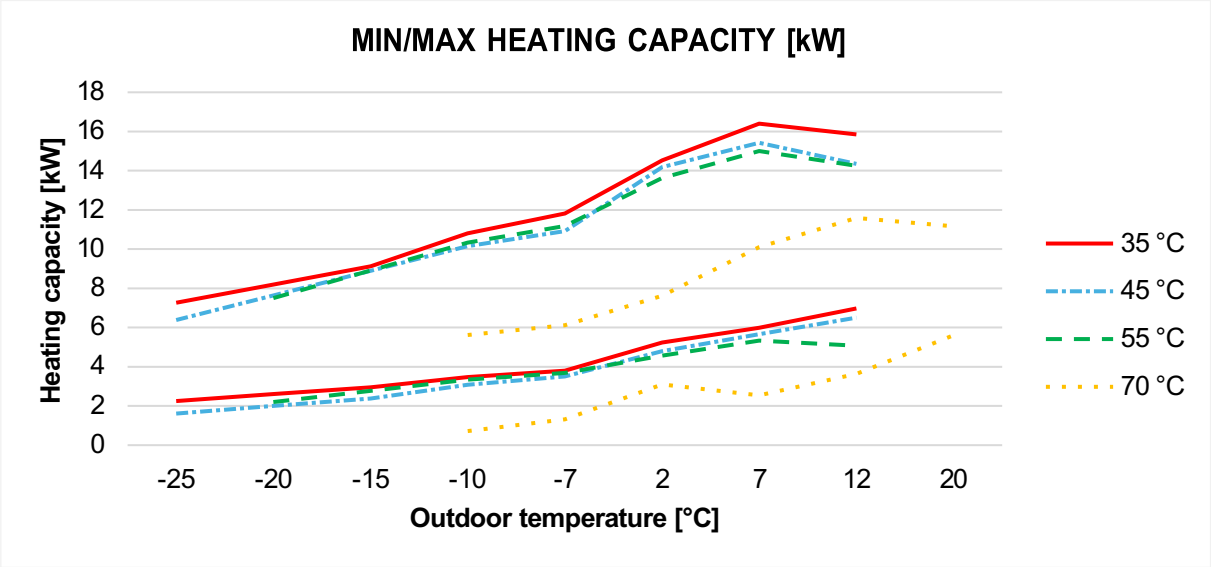
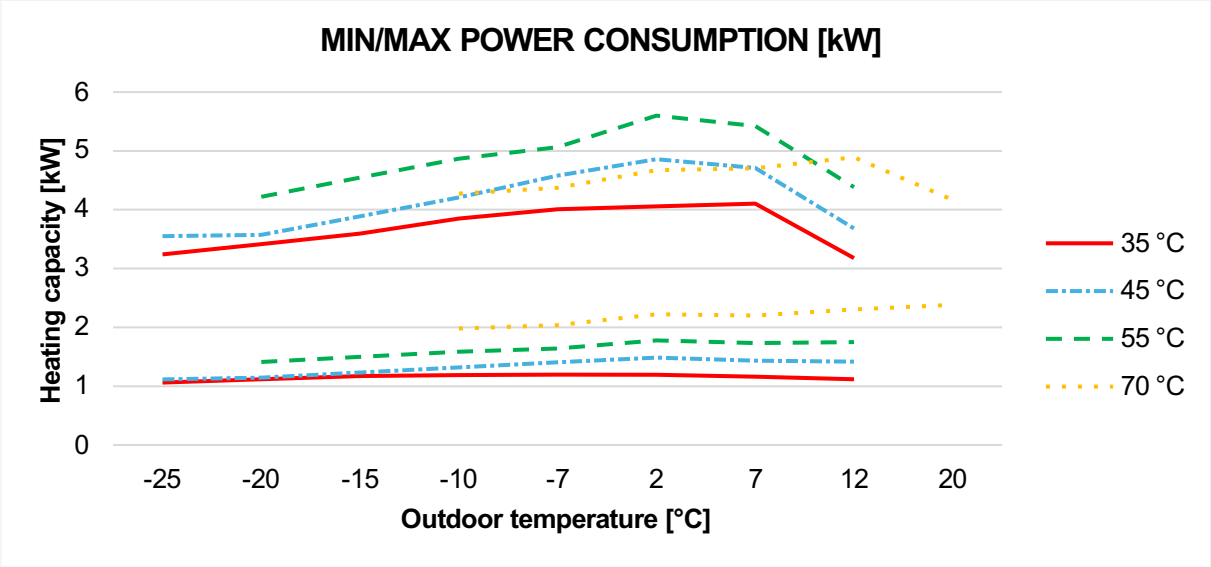
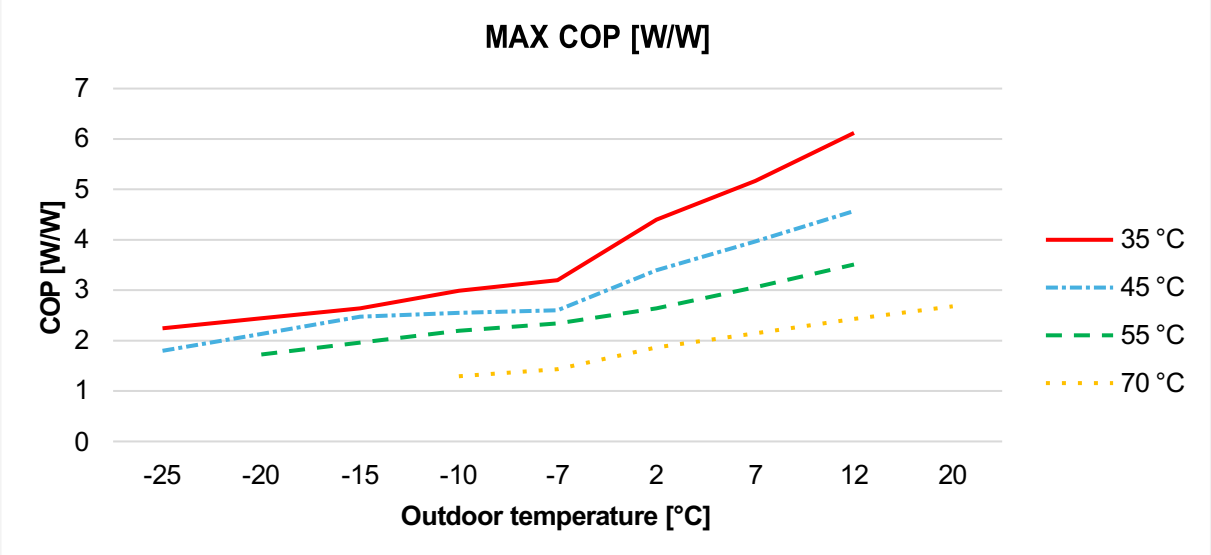
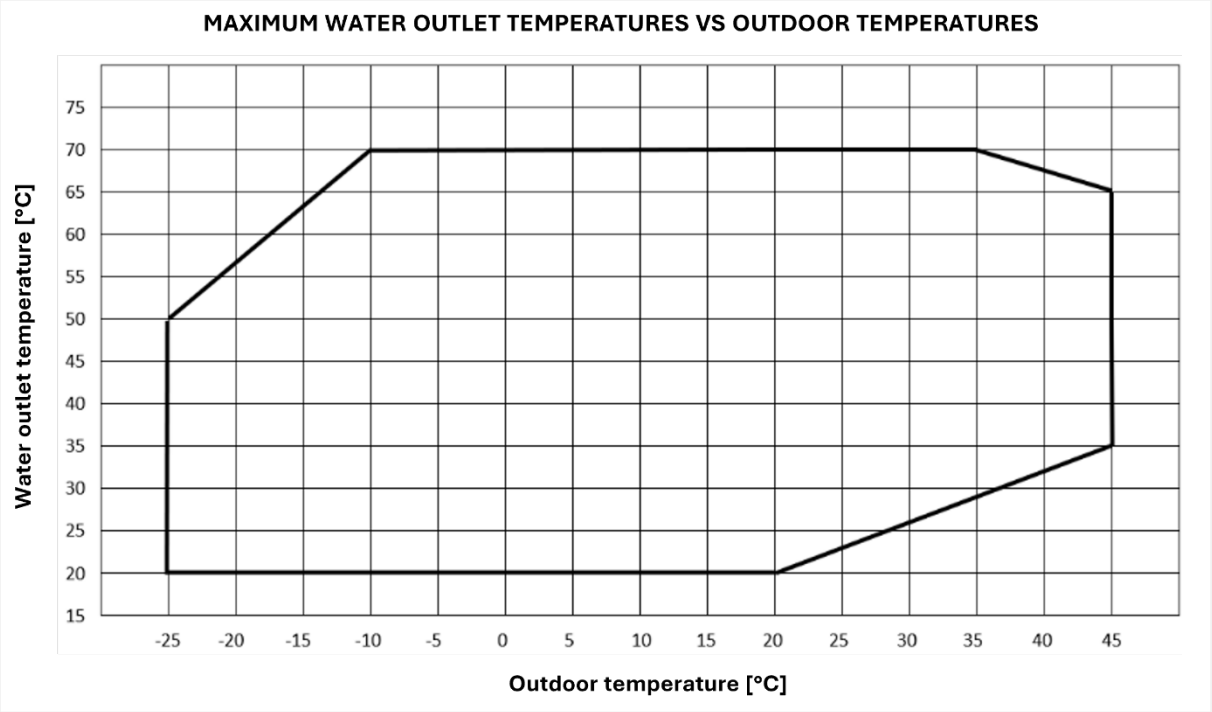






5 Maximum water outlet temperatures vs outdoor temperatures



6 Flow rates

			ES M8 R290	ES M12 R290	ES M15 R290 3 PH & 1 PH
Water pressure drop	At nominal water flow through the heat exchanger	kPa	8	15	23
Minimum water flow for stable operation[1]		l/m	12,33	15,33	20,00
Nominal water flow	Defrost mode[2]	l/m	23,00	34,30	43,00
Nominal water flow	Cooling mode	l/m	18,40	27,47	34,40
Nominal water flow	DHW mode	l/m	16,00	18,50	21,00
Nominal water flow	Heating mode	l/m	23,00	34,30	43,00

[1] Protective minimums are below the stated values.
[2] 100% running speed on PWM.

7 Additional heating data

7.1 ES M8 R290

Outdoor temperature [°C]	Water outlet temperature [°C]	Frequency [Hz]	Capacity [W]	Power [W]	COP [W/W]
20°C	70,0	55	6097	2132	2,86
		43	4717	1667	2,83
		30	3147	1188	2,65
12°C	70,0	69	6637	2597	2,56
		55	5182	2075	2,50
		43	3886	1617	2,40
		30	2525	1166	2,17
	55,0	74	7733	2225	3,48
		61	6389	1815	3,52
		49	5103	1444	3,53
		36	3678	1066	3,45
		30	3003	901	3,33
	45,0	74	8104	1883	4,30
		61	6741	1518	4,44
		49	5446	1203	4,53
		36	3964	883	4,49
		30	3271	746	4,38
	35,0	74	8534	1560	5,47
		61	7144	1248	5,72
		49	5746	982	5,85
		36	4268	712	5,99
		30	3548	598	5,93
7°C	70,0	69	5559	2600	2,14
		55	4455	2059	2,16
		43	3129	1598	1,96
		30	1797	1152	1,56
	55,0	90	8566	2769	3,09
		74	7004	2216	3,16
		61	5778	1806	3,20
		49	4483	1448	3,10
		36	3126	1061	2,95
		30	2509	895	2,80
	45,0	90	8920	2384	3,74
		74	7325	1892	3,87
		61	6053	1524	3,97
		49	4867	1220	3,99
		36	3489	887	3,93
		30	2838	750	3,78
	35,0	90	9315	2034	4,58
		74	7700	1595	4,83
		61	6449	1273	5,07
		49	5165	1007	5,13
		36	3765	726	5,19
		30	3106	613	5,07
2°C	70,0	69	4400	2543	1,73
		55	3331	2005	1,66
		43	2419	1577	1,53
		30	1423	1131	1,26
	55,0	90	7326	2678	2,74
		74	6045	2157	2,80
		61	4938	1771	2,79
		49	3886	1399	2,78
		36	2729	1049	2,60
		30	2161	886	2,44
	45,0	90	7494	2335	3,21
		74	6364	1867	3,41
		61	5201	1520	3,42
		49	4114	1194	3,45
		36	2956	892	3,31

		30	2407	757	3,18
	35,0	90	7984	2042	3,91
		74	6724	1607	4,18
		61	5525	1299	4,25
		49	4375	1012	4,32
		36	3235	752	4,30
		30	2588	640	4,04
-7°C	70,0	69	3064	2389	1,28
		55	2327	1905	1,22
		43	1332	1490	0,89
		30	992	1044	0,95
	55,0	90	5740	2508	2,29
		74	4598	2019	2,28
		61	3696	1660	2,23
		49	2853	1346	2,12
		36	1934	988	1,96
		30	1519	836	1,82
	45,0	90	6006	2220	2,71
		74	4908	1784	2,75
		61	3954	1452	2,72
		49	3096	1165	2,66
		36	2133	853	2,50
		30	1696	726	2,34
	35,0	90	6237	1961	3,18
		74	5210	1581	3,30
		61	4252	1261	3,37
		49	3354	1009	3,32
		36	2383	732	3,26
		30	1912	620	3,08
-15°C	55	90	4124	2375	1,74
		74	3244	1929	1,68
		61	2690	1566	1,72
		49	2010	1275	1,58
		36	1066	964	1,11
		30	627	821	0,76
	45,0	90	4666	2081	2,24
		74	3170	1735	1,83
		61	2641	1411	1,87
		49	2066	1136	1,82
		36	1589	827	1,92
		30	961	711	1,35
	35,0	90	4942	1889	2,62
		74	3988	1521	2,62
		61	2838	1271	2,23
		49	1955	1010	1,94
		36	1247	736	1,69
		30	863	628	1,37
-25°C	50,0	90	2708	2067	1,31
		74	1980	1694	1,17
		61	1361	1406	0,97
		49	897	1146	0,78
		36	466	841	0,55
		30	230	705	0,33
	45,0	90	2877	1955	1,47
		74	1929	1625	1,19
		61	1446	1335	1,08
		49	1032	1081	0,95
		36	956	750	1,27
		30	688	607	1,13
	35,0	90	3208	1689	1,90
		74	2672	1379	1,94
		61	2133	1129	1,89
		49	1630	910	1,79
		36	880	678	1,30
		30	674	574	1,17

7.2 ES M12 R290

Outdoor temperature [°C]	Water outlet temperature [°C]	Frequency [Hz]	Capacity [W]	Power [W]	COP [W/W]
20℃	70,0	55	7894	2961	2,66
		41	5992	2231	2,68
		30	4399	1672	2,63
12℃	70,0	67	8625	3527	2,44
		55	7206	2930	2,45
		41	5276	2178	2,42
		30	3765	1624	2,31
	55,0	74	10213	3127	3,26
		60	8433	2501	3,37
		49	6925	2033	3,40
		36	5128	1491	3,43
		30	4258	1253	3,39
	45,0	74	10682	2685	3,97
		60	8823	2113	4,17
		49	7285	1699	4,28
		36	5379	1227	4,38
		30	4562	1025	4,45
	35,0	74	11145	2256	4,94
		60	9275	1755	5,28
		49	7683	1390	5,52
		36	5691	987	5,76
		30	4806	825	5,82
	35,0	90	11179	2899	3,85
		74	9710	2269	4,27
		60	8041	1772	4,53
		49	6591	1411	4,67
		36	4872	1003	4,85
		30	4123	839	4,91
7℃	45,0	90	11416	3341	3,41
		74	9358	2649	3,53
		60	7720	2091	3,69
		49	6331	1702	3,71
		36	4655	1230	3,78
		30	3933	1028	3,82
	55,0	90	10991	3840	2,86
		74	8971	3067	2,92
		60	7368	2454	3,00
		49	6069	2000	3,03
		36	4431	1467	3,02
		30	3681	1239	2,97
	70,0	67	7686	3470	2,21
		55	5917	2861	2,06
		41	4422	2122	2,08
		30	3115	1582	1,96
	35,0	90	10170	2832	3,59
		74	8534	2237	3,81
		60	6730	1762	3,81
		49	5835	1408	4,14
		36	4318	1044	4,13
		30	3606	882	4,08
2℃	45,0	90	9924	3217	3,08
		74	8246	2590	3,18
		60	6833	2080	3,28
		49	5584	1661	3,36
		36	4072	1240	3,28
		30	3376	1051	3,21
	55,0	90	9522	3696	2,57
		74	7850	2963	2,64
		60	6526	2417	2,70
		49	5274	1941	2,71
		36	3877	1463	2,65
		30	3135	1242	2,52
	70,0	67	5863	3363	1,74

		55	4587	2746	1,67
		41	3408	2068	1,65
		30	2562	1572	1,62
-7°C	35,0	90	8155	2694	3,02
		74	6804	2164	3,14
		60	5483	1698	3,22
		49	4417	1384	3,19
		36	3284	992	3,31
		30	2680	834	3,21
	45,0	90	7941	3018	2,63
		74	6533	2439	2,67
		60	5287	1944	2,71
		49	4233	1584	2,67
		36	3064	1152	2,65
		30	2492	984	2,53
	55,0	90	7575	3409	2,22
		74	6283	2763	2,27
		60	5044	2224	2,26
		49	4004	1824	2,19
		36	2777	1346	2,06
		30	2272	1145	1,98
	70,0	67	4951	3092	1,6
		55	4056	2541	1,59
		41	2015	1925	1,04
		30	1521	1447	1,05
-15°C	35,0	90	6618	2519	2,62
		74	5331	2050	2,6
		60	4285	1616	2,65
		49	3468	1310	2,64
		36	2492	939	2,65
		30	1995	794	2,51
	45,0	90	6016	2743	2,19
		74	5181	2273	2,27
		60	4162	1830	2,27
		49	3349	1494	2,24
		36	2339	1097	2,13
		30	1679	954	1,75
	55,0	90	6104	3148	1,93
		74	4983	2563	1,94
		60	3916	2069	1,89
		49	3139	1702	1,84
		36	1954	1281	1,52
		30	1391	1090	1,27
-25°C	35,0	90	4723	2325	2,03
		74	3857	1849	2,08
		60	3048	1500	2,03
		49	2296	1228	1,86
		36	1532	897	1,7
		30	989	761	1,29
	45,0	90	4548	2541	1,78
		74	3335	2104	1,58
		60	2640	1676	1,57
		49	2041	1384	1,47
		36	1369	1022	1,33
		30	829	861	0,96
	50,0	90	4133	2669	1,54
		74	3134	2213	1,41
		60	2764	1769	1,56
		49	2193	1429	1,53
		36	1027	1082	0,94
		30	711	913	0,77

7.3 ES M15 R290 1 PH & ES M15 R290 3 PH

Outdoor temperature [°C]	Water outlet temperature [°C]	Frequency [Hz]	Capacity [W]	Power [W]	COP [W/W]
20°C	70,0	55	11165	4166	2,68
		40	8321	3267	2,55
		31	5606	2383	2,35
12°C	70,0	67	11590	4892	2,37
		55	9719	3998	2,43
		40	4952	2944	1,68
		31	3644	2306	1,58
	55,0	74	14247	4382	3,19
		61	11974	3493	3,36
		45	8902	2533	3,51
		36	7064	2009	3,48
		31	5068	1747	2,82
	45,0	74	14344	3683	3,81
		61	12653	2911	4,28
		45	9463	2077	4,47
		36	7572	1636	4,57
		31	6504	1418	4,55
	35,0	74	15845	3177	4,94
		61	13247	2375	5,49
		45	9983	1681	5,82
		36	8050	1293	6,12
		31	6974	1116	6,08
7°C	35,0	90	16401	4103	4
		74	13920	3255	4,28
		61	11569	2449	4,72
		45	8648	1749	4,94
		36	6907	1339	5,15
		31	5993	1158	5,17
	45,0	90	15423	4711	3,27
		74	13265	3746	3,54
		61	10957	2934	3,73
		45	8167	2122	3,85
		36	6549	1650	3,97
		31	5669	1431	3,96
	55,0	90	15003	5424	2,76
		74	12833	4389	2,91
		61	10550	3489	3,02
		45	7814	2548	3,05
		36	6150	1993	3,06
		31	5333	1734	3,06
	70,0	67	10096	4703	2,15
		55	6972	3877	1,80
		40	3962	2812	1,41
		31	2545	2200	1,16
2°C	35,0	90	14532	4057	3,58
		74	12349	3161	3,91
		61	10100	2475	4,08
		45	7501	1732	4,33
		36	6059	1375	4,41
		31	5243	1192	4,4
	45,0	90	14185	4858	2,92
		74	11690	3834	3,05
		61	9752	2988	3,26
		45	7190	2118	3,39
		36	5680	1706	3,33
		31	4790	1485	3,23
	55,0	90	13625	5599	2,43
		74	11300	4451	2,54
		61	8931	3610	2,47
		45	6279	2599	2,42
		36	5344	2026	2,64
		31	4564	1777	2,57
	70,0	67	7623	4671	1,63

		55	7001	3753	1,87
		40	3994	2815	1,42
		31	3091	2221	1,39
-7°C	35,0	90	11816	4005	2,95
		74	9573	3124	3,06
		61	7701	2412	3,19
		45	5641	1764	3,20
		36	4370	1394	3,13
		31	3798	1196	3,18
	45,0	90	10923	4581	2,38
		74	9225	3619	2,55
		61	7408	2845	2,60
		45	5321	2057	2,59
		36	4190	1620	2,59
		31	3501	1407	2,49
	55,0	90	11173	5064	2,21
		74	8926	3956	2,26
		61	7454	3185	2,34
		45	5559	2413	2,30
		36	4276	1875	2,28
		31	3683	1639	2,25
	70,0	67	6120	4372	1,40
		55	5065	3527	1,44
		40	2108	2602	0,81
		31	1312	2040	0,64
-15°C	35,0	90	9128	3593	2,54
		74	7501	2915	2,57
		61	6096	2320	2,63
		45	4510	1709	2,64
		36	3439	1339	2,57
		31	2951	1174	2,51
	45,0	90	8887	3593	2,47
		74	7205	2915	2,47
		61	5691	2320	2,45
		45	4159	1709	2,43
		36	3201	1339	2,39
		31	2380	1174	2,03
	55,0	90	8914	4544	1,96
		74	6708	3692	1,82
		61	5347	2967	1,80
		45	4037	2226	1,81
		36	3059	1750	1,75
		31	2771	1499	1,85
-25°C	35,0	90	7265	3237	2,24
		74	5735	2600	2,21
		61	4506	2079	2,17
		45	3339	1547	2,16
		36	2587	1201	2,15
		31	2250	1060	2,12
	45,0	90	6384	3550	1,80
		74	5103	2868	1,78
		61	3965	2263	1,75
		45	2695	1716	1,57
		36	1949	1348	1,45
		31	1612	1114	1,45
	50,0	90	6231	3748	1,66
		74	4894	3042	1,61
		61	3816	2411	1,58
		45	2605	1815	1,44
		36	1494	1521	0,98
		31	1162	1318	0,88

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