INPUTS

Technical data (TÜV page 3)

Model		KS50-DC					
Outdoor unit				***Indoor unit***			
Heating capacity		5000	W	Max. Input Power		2070	W
Heating power input		1020	W	Power supply	50Hz/1Ph	230	V
Power supply	50Hz/1Ph	230	V	Rated Current		9.4	A
Rated Current		5.0	A	Electrical Heater Power		2000	W
Max. input power		2250	W	Electrical Heater Current		8.8	A
Max. Discharge Pressure		4.8	MPa	Water Pump Flux		0.9	m3/h
Max. Suction Pressure		1.2	MPa	Noise	<	44	dB(A)
Refrigerant	R32	1.15	kg	Net Weight		26	kg
Noise	<	48	dB(A)				
Water Proof Class		IPX4		***Declared parameters***			
Climater Type		T1		Heating Capacity (at Tamb=7°C)		5250	W
Net Weight		40	kg	Power Input		1040	W

Test Results (TÜV page 6)

Air for outdoor unit (Dry bulb/ Wet bulb)	Water for Hydro unit (inlet/outlet)	Ratio of tested to declared COP	Tested Heating Capacity	Tested Power Input	Tested COP	Tested Water Flow	Water Pressure Drop
°C / °C	°C / °C		W	W	W/W	m3/h	kPa
7 / 6	40 / 45	-	4356	1232	3.54	0.81	5.2
7 / 6	30 / 35	93%	4750	1008	4.71	0.82	5.3
2 / 1	- / 45	-	3320	1236	2.69	0.87	5.0
2 / 1	30 / 35	-	4320	1095	3.95	0.87	5.1
-7 / -8	- / 35	-	3202	1154	2.77	0.81	5.1
10 / 8	30 / 35	-	4981	1022	4.87	0.81	5.5
-7 / -8	- / 55	-	1784	1369	1.30	0.81	5.5
2 / 1	- / 55	-	2637	1473	1.79	0.82	4.0
7 / 6	- / 55	-	4618	1675	2.76	0.81	5.5
15 / 12	- / 55	-	5334	1447	3.69	0.85	5.6

RESULTS

EN 14825:2012, Chapter 7 Calculation methods for reference SCOP

Full load heating capacity	Pdesign_h	4.83	kW	(see next page calc. Annex B)
Equivalent heating hours	H_he	2066	h/a	
Reference annual heating demand	Q_H	9976	kWh	(see next page calc. Annex B)
SCOP in active mode	SCOP_on	3.42	W/W	(see next page calc. Annex B)

EN 14825:2012, Annex D Table D.2 and D.4 - Number of hours of reference SCOP, average, heating only

Thermostat OFF mode operation	H_TO	179	h/a	P_TO	0 W
Standby mode operation	H_SB	0	h/a	P_SB	0 W
Crankcase heater mode operation	H_CK	3851	h/a	P_CK	0 W
Unit OFF mode operation	H_OFF	3672	h/a	P_OFF	0 W

Seasonal Coefficient of Performance	SCOP =	3.42 W/W
Seasonal space heating energy efficiency	ηs =	134%

Energy label at low temperature applicaton level
According to 811/2013/EU (2013. feb. 18.) Annex II. Table 2

A+

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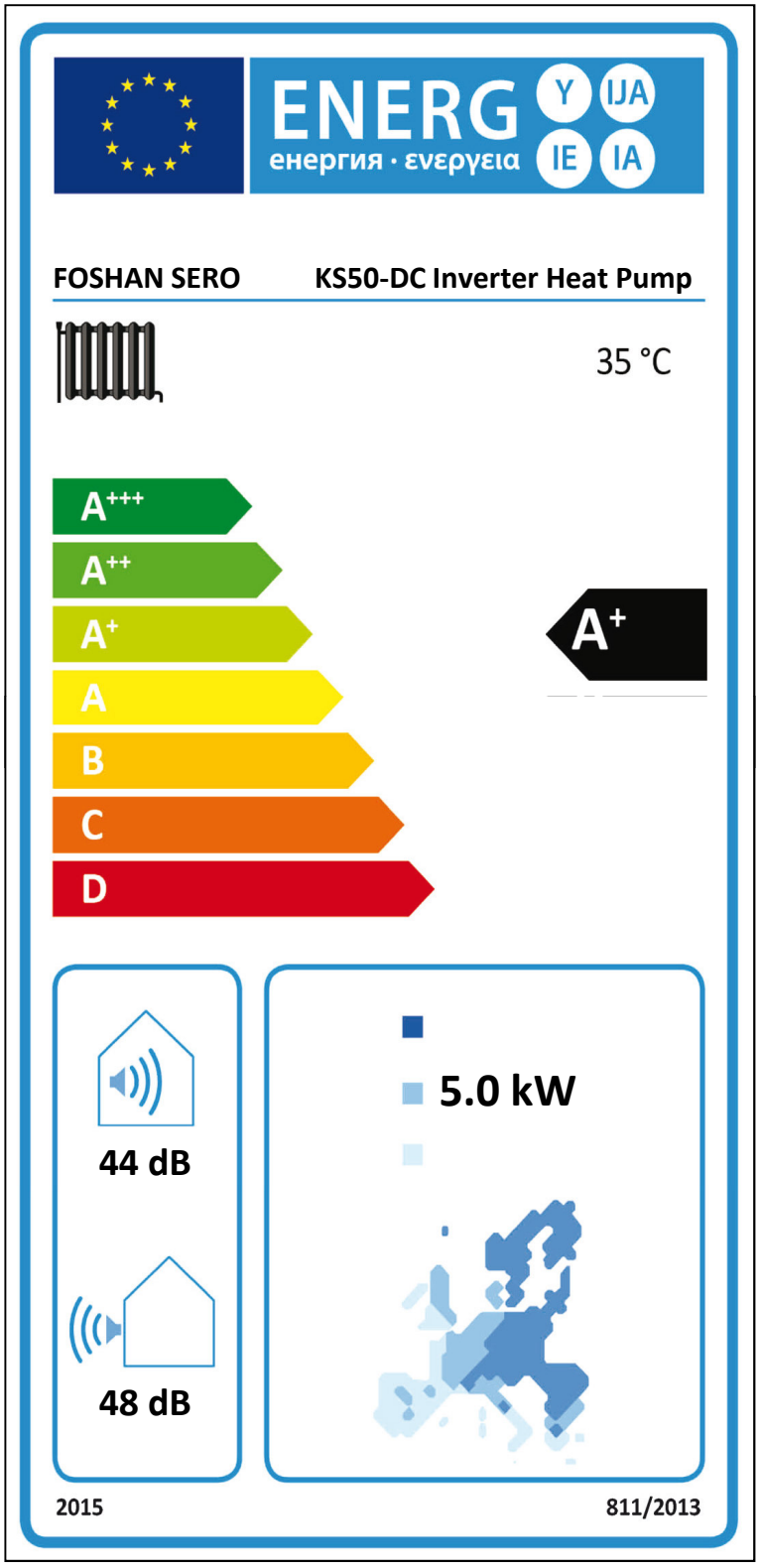

EN 14825:2012, Annex B calculation for SCOP_on of air-to-water heat pump

Climate		Average	
Application level		Low temperature	
Heat exchanger outlet mode		Variable outlet	
Design outdoor temperature	T_design	-10	°C
Bivalent outdoor temperature	T_bivalent	-2	°C
Heat exchanger outlet temp.	T_fixed	35	°C
Declared capacity at T_design	P_declared	2.83	kW
Full load capacity (at T_design)	Pdesign_h	4.83	kW

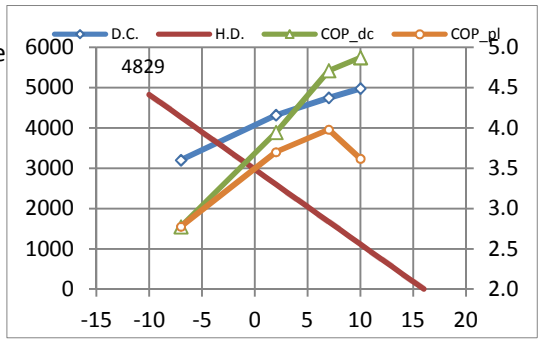

Table B.1 - Data for SCOP

	Outdor air temp. °C	Tout water variable °C	Part load ratio %	Part load heat W	Declared capacity W	Declared COP_dc W/W	air-to-wate degr. coeff. Cc	capacity ratio CR	Part load COP_pl W/W
A	-7	34	88%	4272	3202	2.77	0.9	1	2.77
B	2	29	54%	2600	4320	3.95	0.9	0.60	3.70
C	7	27	35%	1672	4750	4.71	0.9	0.35	3.98
D *	10	25	23%	1114	4981	4.87	0.9	0.22	3.62
TOL	-10	37	100%	4829	2829	2.38	0.9	1	2.38
Tbiv	-2	31	69%	3343	3823	3.42	0.9	1	3.38

Table B.2 - Calculation BIN for SCOP_on

	Outdor air temp. Tj °C	BIN hours hj h	Heat load Ph(Tj) W	Electrical heating elbu(Tj) W	Heat pump heating Q_pl(TJ) W	Heat pump power P_pl(TJ) W	COP_pl W/W	Annual heating hj x Ph(Tj) kWh	Annual energy hj x (P+el) kWh
TOL	-10	1	4829	2000	2829	1187	2.38	5	3
	-9	25	4644	1690	2954	1175	2.51	116	72
	-8	23	4458	1380	3078	1164	2.64	103	59
A	-7	24	4272	1070	3202	1154	2.77	103	53
	-6	27	4086	760	3326	1156	2.88	110	52
	-5	68	3901	450	3450	1158	2.98	265	109
	-4	91	3715	140	3575	1159	3.08	338	118
	-3	89	3529		3699	1161	3.19	314	103
Tbiv	-2	165	3343	0	3343	1017	3.29	552	168
	-1	173	3158	0	3158	931	3.39	546	161
	0	240	2972	0	2972	850	3.49	713	204
	1	280	2786	0	2786	774	3.60	780	217
B	2	320	2600	0	2600	703	3.70	832	225
	3	357	2415	0	2415	643	3.76	862	229
	4	356	2229	0	2229	585	3.81	793	208
	5	303	2043	0	2043	528	3.87	619	160
	6	330	1857	0	1857	473	3.92	613	156
C	7	326	1672	0	1672	420	3.98	545	137
	8	348	1486	0	1486	385	3.86	517	134
	9	335	1300	0	1300	348	3.74	436	117
D *	10	315	1114	0	1114	308	3.62	351	97
	11	215	929	0	929	265	3.50	200	57
	12	169	743	0	743	220	3.38	126	37
	13	151	557	0	557	171	3.26	84	26
	14	105	371	0	371	118	3.14	39	12
	15	74	186	0	186	62	3.02	14	5
	16	0	0	0	0	0	2.90	0	0
						Total yearly energy		9976	2919

*D * is different test condition from T_amb = 12°C*

SCOP_on =	3.42