

Compact air source heat pump **vamp^{air}** - technical report

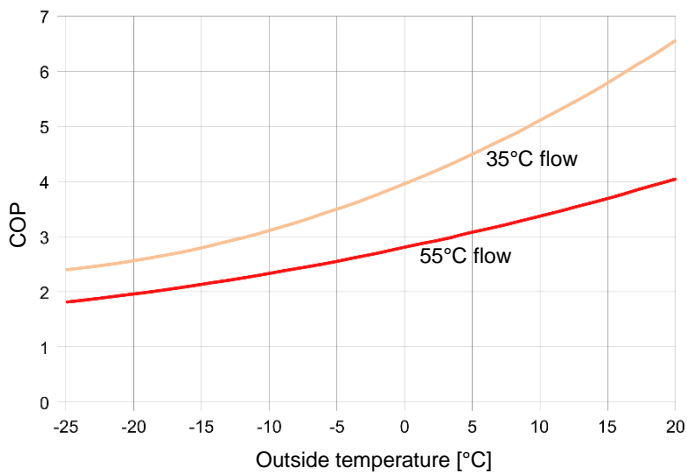
1 Description

A++

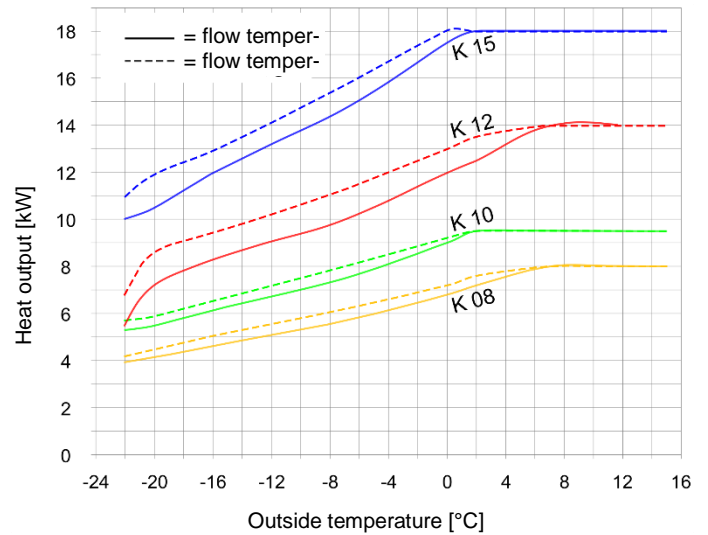


- Air/water heat pump for room heating/cooling and preparation of hot water.
- Inverter technology: Stepless power control, no uneconomical start/stop operation.
- Whisper-quiet operation through low-noise technology.
- Enhanced Vaporized Injection (EVI) for low outside temperatures (-22°C).

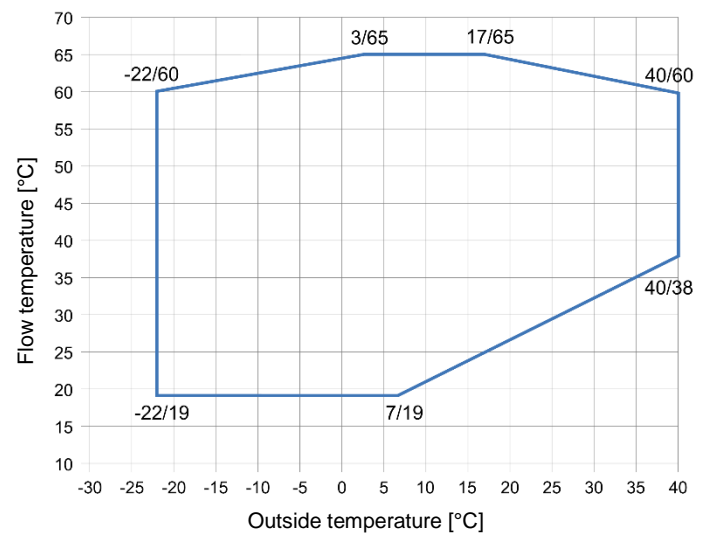
2 COP Coefficient of Performance



3 Heat output



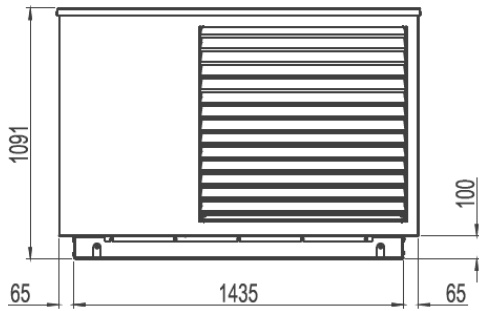
4 Operating range



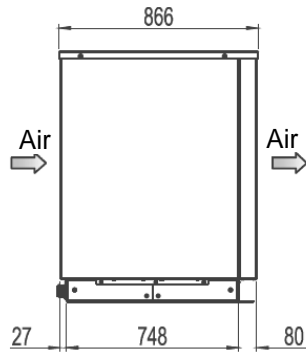
5 Dimensions

vamp^{air} K 08 and K 10

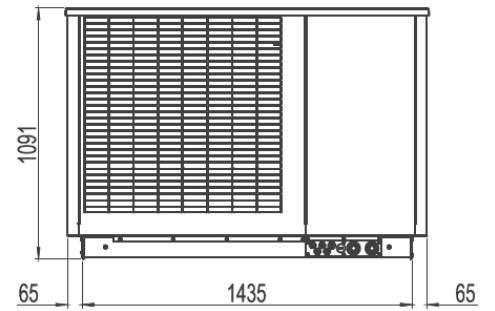
View from the front



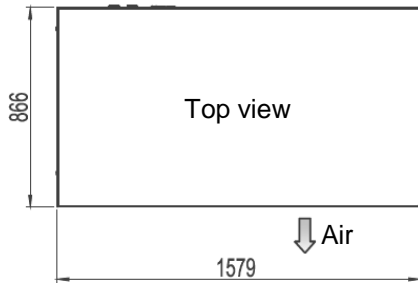
View from the side



View from the back

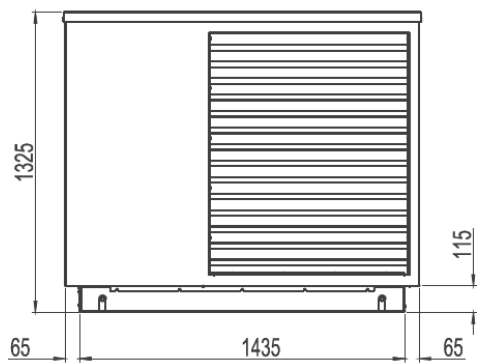


↓ Air

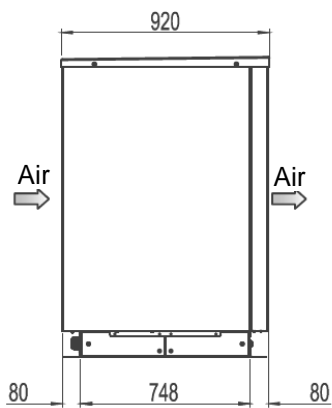


vamp^{air} K 12 and K 15

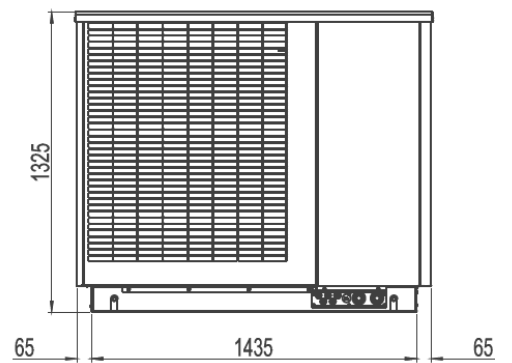
View from the front



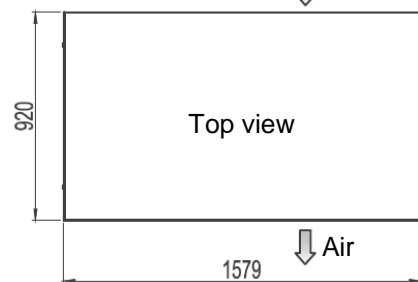
View from the side



View from the back



↓ Air



6 Technical specifications

vamp^{air}		K 08	K 10	K 12	K 15
Recommended building heat load ^[1]	[kW]	5.7	7.8	9.4	15
SCOP, moderate climate W35/W55 (EN 14825)		4.2 / 3.4	4.73 / 3.8	4.4 / 3.4	4.95 / 3.85
ηs seasonal room heating energy efficiency, moderate climate 35/55 °C	[%]	165 /133	186 / 149	173 /133	195 / 151
Energy data					
Energy efficiency class, moderate climate W35/W55		A++ / A++	A++ / A++	A++ / A++	A++ / A++
Energy efficiency class incl. boiler control, moderate climate W35/W55		A++ / A++	A+++ / A+++	A++ / A++	A+++ / A+++
Heat output according to EN 14511					
Max. heat output at OT -7/W35	[kW]	5.7	7.5	10.0	14.7
Max. heat output at OT -10/W35	[kW]	5.3	7.0	9.4	13.7
Heat output at OT10/W35	[kW]	4.57	6.09	6.46	11.56
Heat output at OT7/W35 (EN 14511) for 5K	[kW]	4.29	6.19	6.06	11.98
Heat output at OT2/W35	[kW]	3.94	5.47	7.31	9.46
Heat output at OT-7/W35	[kW]	5.68	5.83	10.08	11.26
Heat output at OT7/W55	[kW]	4.41	6.36	6.0	11.72
Cooling performance figures according to EN 14511					
Max. cooling capacity OT35 / W18	[kW]	5	6	10	15
Max. cooling capacity OT35/W7 ^[2]	[kW]	4	5	8	13
Power consumption					
Fan power consumption max.	[W]	35	81	60	170
Power consumption at OT10/W35	[kW]	0.86	1.13	1.2	2.1
Power consumption at OT7/W35 (EN 14511)	[kW]	0.88	1.24	1.2	2.4
Power consumption at OT2/W35	[kW]	0.95	1.25	1.7	2.1
Power consumption at OT-7/W35	[kW]	1.8	1.66	3.15	3.24
Power consumption at OT7/W55	[kW]	1.4	1.92	1.8	3.43
Output figures according to EN 14511					
Coefficient of Performance COP at OT10/W35		5.3	5.4	5.4	5.5
Coefficient of Performance COP at OT7/W35 (EN 14511)		4.83	4.97	5.0	5.0
Coefficient of Performance COP at OT2/W35		4.15	4.37	4.2	4.49
Coefficient of Performance COP at OT-7/W35		3.16	3.51	3.2	3.47
Coefficient of Performance COP at OT7/W55		3.17	3.32	3.3	3.41
Sound data					
Sound power level (EN 12102)	[dB(A)]	45	50	48	55
Sound pressure level at 5 m distance, in free field Silent Mode	[dB(A)]	18	21.7	22	22
Sound pressure level at 3 m distance, set up in the open Silent Mode	[dB(A)]	25.5	29.2	29.5	29.5
Sound pressure level at 5 m distance, set up in the open Silent Mode	[dB(A)]	21	24.7	25	25
Sound pressure level at 4 m distance, set up against a wall Silent Mode	[dB(A)]	26	29.7	30	30
Sound power level max. (day/silent)	[dB(A)/dB(A)]	46 / 43	54 / 47	50 / 47	63 / 47
Cooling circuit					
Refrigerant		R410A			
Refrigerant fill level	[kg]	4.78	6.7		
GWP (according to EN 378), kg CO ₂ equivalent per kg	[kg/kg]	1923.5			
CO ₂ -equivalent	[t]	9.98	13.99		
Condenser material		1.4401/Cu			
Operating limits					
Operating limit outside air min.	[°C]	-22			

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Operating limit outside air max.	[°C]	35°C			
Operating limit heat-side air min.	[°C]	26°C			
Operating limit heat-side air max.	[°C]	65°C			
Operating limit outside air at W60	[°C]	-22°C			
Operating limit outside air at W65	[°C]	-5			
Water hardness	[°dH]	4 – 8.5			
pH value		7.5 – 9			
Conductivity	[μS/cm]	10 – 500			
Free chlorine	[mg/l]	< 0.5			

Electrical data

Protection type (IP)	IP X4
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1-phase version (K 08.1, K 10.1, K 12.1, K 15.1)

Number of compressors		1	-
Compressor connection		~230 V, 50 Hz, 5,5 kW	-
Control connection		~230 V 50 Hz	-
Compressor fuse	[A]	25	-
Control fuse	[A]	10	-
Starting current	[A]	15	-

3-phase version (K 08.3, K 10.3, K 12.3, K 15.3)

Number of compressors		1	
Compressor connection		~400 V, 50 Hz; 5,5 kW	~400 V, 50 Hz; 8 kW
Control connection		~230 V, 50 Hz	
Additional heating power consumption max.	[kW]	3 / 6 / 9	
Additional heating connection		~400 V, 50 Hz	
Compressor fuse	[A]	13	16
Control fuse	[A]	10	10
Additional heating fuse	[A]	13	13
Starting current	[A]	6.5	8

Dimensions

Height	[mm]	1090	1325
Width	[mm]	1580	1580
Depth	[mm]	870	920
Weight	[kg]	325	390

Connections

Connection for heating flow/return	["]	G 5/4" AG
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Flow rates

Air flow rate	[m³/h]	1300	2900	2000	4400
Heating flow rate min.	[l/h]	520	520	800	800
Heating volume flow rate min. for defrosting and commissioning ^[3]	[l/h]	1560	1560	2500	2500
Heating flow rate (EN 14511) at OT7/W35 and 5 K	[l/h]	1080	1080	2080	2080

[1] At standard outside temperature -14°C, heating limit temperature 15°C, flow 35°C/return 28°C, taking into account 5% share of peak load heat generator (without domestic hot water)

[2] With extension set *low-temperature cooling*

[3] If this volume flow is not achieved via the heat pump plate heat exchanger (= heating volume flow), commissioning is not possible.

7 Parameters for evaluation with regard to mains reactions (for ESC)

vamp ^{air}		K 08	K 10	K 12	K 15
System data					
Manufacturer	SOLARFOCUS GmbH				
Type of device	Compact air source heat pump				
Rated values					
Rated current	12 A				
Operation with converter	Yes				
Power factor correction	No				
Mains connection	Control: 230 V Compressor: 400 V				
Mains connection - 1-phase or 3-phase	3-phase				
Maximum electrical output	5.5 kW				8.0 kW
Rated power	5.5 kW				8.0 kW
Displacement factor $\cos \phi$ at rated output	>0.9				
Displacement factor $\cos \phi$ at maximum output	>0.9				
Feedback into the mains	No				
Constant load change	No				
Compressor - 1-phase or 3-phase	3-phase				
Startup control					
Start up assistance for the compressor With frequency inverter	Yes Output frequency of 25 Hz to 120 Hz				
Starting under load	No				
Starting current	<12 A				
Number of startup processes	max. 8 per h				
Starting current to nominal current ratio	0.81				0.71
Auxiliary heating					
Auxiliary heating output	3, 6 or 9 kW - depending on connection type				
Auxiliary heating - 1-phase or 3-phase	3-phase				