

TEST REPORT

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300-KLAB-21-027 rev. 1
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Page 1 of 80
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Component: Brand: Bosch
Type: Air to water heat pump
Model: Outdoor: Compress CS3400iAWS 14-T
Indoor: Compress AWES 10 E
Series no.: Outdoor: 3700-140-000006-8750722688
Indoor: 8370-178-000001-8738212148
Prod. year: N.a.

Dates: Component tested: June-September_2021

Procedure: See objective (page 2) for list of standards.

Remarks: This report has been revised due to a typo error of test result for the fan cooling. The unit was delivered by the customer. The installation and test settings were done according to the manufacturer's instructions. All tests are done with enabled defrost mode. According to the manufacture, the results of this test report are also applicable to the heat pump: Buderus WLW166 SP14 / Buderus WLW166 10/14 HE E

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Test Rep. nr.



Objective

The objective of this report is to document the following:

The Seasonal Coefficient of Performance (SCOP) at low and high temperature application for average and warmer climate according to EN 14825:2013. In order to calculate the SCOP, tests were carried out at the part load conditions stated in the table on page 5 and 7.

SCOP test points at low temperature application for colder climate according to EN 14825:2013. Part load conditions are stated in the table on page 5.

- Test point (E) -20°C
- Test point (G) -15°C
- Test point (A) -7°C
- Test point (C) 7°C

SCOP test points at high temperature application for colder climate according to EN 14825:2013. Part load conditions are stated in the table on page 7.

- Test point (E) -17°C
- Test point (G) -15°C

The Seasonal Energy Efficiency Rate (SEER) for fan cooling and cooling floor according to EN 14825:2013. In order to calculate the SEER, tests were carried out at the part load conditions stated in the table on page 9.

Rating condition tests at low temperature application for space heating according to EN 14511:2011

- Test point A7W35
- Test point A2W35
- Test point A-7W35

Additional performance tests for space heating according to EN 14511:2011

- Test point A7W60
- Test point A-7W60

Standard rating condition tests for space cooling according to EN 14511:2011

- Test point A35W18 (cooling floor)
- Test point A35W7 (fan cooling)

Sound power measurements of the outdoor unit as the variant of 10kW, 12kW and 14kW according to EN 12102-1:2017



Contents:

Test conditions	5
SCOP test conditions for low temperature – EN 14825:2013.....	5
SCOP test conditions for high temperature – EN 14825:2013	7
SEER test conditions for fan cooling and cooling floor – EN 14825:2013.....	9
Test conditions for rating tests – space heating – EN 14511:2011.....	10
Test conditions for additional performance tests – space heating – EN 14511:2011.....	10
Test conditions for standard rating tests - space cooling EN 14511:2011	11
Test conditions for sound power measurements – EN 12102-1:2017	12
Test results.....	13
Test results of SCOP test at low temperature - heating season average – EN 14825:2013	13
Test results of SCOP test at high temperature - heating season average – EN 14825:2013	14
Test results of SCOP test at low temperature - heating season warmer – EN 14825:2013	15
Test results of SCOP test at high temperature - heating season warmer – EN 14825:2013.....	16
Test results of SCOP test points at low temperature and colder climate – EN 14825:2013.....	17
Test results of SCOP test points at high temperature and colder climate – EN 14825:2013.....	17
Test results of SEER test - fan cooling – EN 14825:2013.....	18
Test results of SEER test - cooling floor– EN 14825:2013.....	19
Test results for rating condition test – space heating – EN 14511:2011	20
Test results for additional performance test – space heating – EN 14511:2011	20
Test results for standard rating condition test – space cooling – EN 14511:2011.....	20
Test results of sound power measurements – EN 12102-1:2017	21
Photo	22
SCOP - detailed calculation	24
Detailed SCOP calculation of low temperature and average climate conditions – EN 14825:2013	24
Detailed SCOP calculation of high temperature and average climate conditions – EN 14825:2013	26
Detailed SCOP calculation of low temperature and warmer climate conditions – EN 14825:2013	28
Detailed SCOP calculation of high temperature and warmer climate conditions – EN 14825:2013.....	30
Detailed SEER calculation of fan cooling – EN 14825:2013	32
Detailed SEER calculation of cooling floor – EN 14825:2013	34
Detailed test results	36
Detailed SCOP test results - low temperature application and average climate conditions - EN 14825:2013	36
Detailed SCOP test results - high temperature application and average climate conditions - EN 14825:2013	41
Detailed SCOP test results - low temperature application and warmer climate conditions - EN 14825:2013	46
Detailed SCOP test results - high temperature application and warmer climate conditions - EN 14825:2013	49



Detailed SCOP test results - low temperature application and colder climate conditions - EN 14825:2013	52
Detailed SCOP test results - high temperature application and colder climate conditions - EN 14825:2013	56
Detailed SEER test results for, fan coil cooling- EN 14825:2013	58
Detailed SEER test results for, cooling floor cooling-EN 14825:2013	62
Detailed test results for rating condition tests at low temperature application for space heating according to EN 14511:2011	66
Detailed test results for additional performance tests for space heating according to EN 14511:2011 ..	69
Detailed standard rating condition test results for fan coil space cooling - EN 14511:2011	71
Detailed test results of sound power measurements – EN 1202-1:2017	73
Test N#1	73
Test N#2	74
Test N#3	75
Test N#4	76
Test N#5	77
Test N#6	78
Test N#7	79
Appendix 1: Test Procedure.....	80



Test conditions

SCOP test conditions for low temperature – EN 14825:2013

Part load conditions for reference SCOP and reference SCOPon calculation of air to water units for low temperature application for the reference heating season;

"A" = average, "W" = warmer, and "C" = colder.

Condition ^a	Part Load Ratio in %				Outdoor heat exchanger		Indoor heat exchanger			
					Inlet dry (wet) bulb temperature °C		Fixed outlet °C	Variable outlet ^d °C		
	Formula	A	W	C	Outdoor air	Exhaust air	All climates	A	W	C
A	$(-7 - 16) / (T_{\text{designh}} - 16)$	88	n/a	61	-7(-8)	20(12)	^a / 35	^a / 34	n/a	^a / 30
B	$(+2 - 16) / (T_{\text{designh}} - 16)$	54	100	37	2(1)	20(12)	^a / 35	^a / 30	^a / 35	^a / 27
C	$(+7 - 16) / (T_{\text{designh}} - 16)$	35	64	24	7(6)	20(12)	^a / 35	^a / 27	^a / 31	^a / 25
D	$(+12 - 16) / (T_{\text{designh}} - 16)$	15	29	11	12(11)	20(12)	^a / 35	^a / 24	^a / 26	^a / 24
E	$(TOL - 16) / (T_{\text{designh}} - 16)$				TOL	20(12)	^a / 35	^a / b	^a / b	^a / b
F	$(T_{\text{bivalent}} - 16) / (T_{\text{designh}} - 16)$				T _{bivalent}	20(12)	^a / 35	^a / c	^a / c	^a / c
G	$(-15 - 16) / (T_{\text{designh}} - 16)$	n/a	n/a	82	-15	20(12)	^a / 35	n/a	n/a	^a / 32

^a With the water flow rate as determined at the standard rating conditions given in EN 14511-2 at 30/35 conditions for units with a fixed water flow rate, and with a fixed delta T of 5 K for units with a variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum flow rate is used with the outlet temperature.

^b Variable outlet shall be calculated by interpolation from T_{designh} and the temperature which is closest to the TOL.

^c Variable outlet shall be calculated by interpolation between the upper and lower temperatures which are closest to the bivalent temperature.

^d If the variable outlet temperature is below the minimum of the operation range of the unit, this minimum should be considered.

Additional information

Climate	T _{designh} [°C]	T _{bivalent} [°C]	TOL [°C]	Outlet temperature	Flow rate
Average	-10	-10	-10	Variable	Variable
Warmer	2	2	2	Variable	Variable



Part load condition	Compressor speed (Hz)		
	Average	Warmer	Colder
A	75	-	45
B	30	75	-
C	20	29	20
D	20	20	-
E(Tol)	80	75	80
F	80	75	-
G	-	-	80



SCOP test conditions for high temperature – EN 14825:2013

Part load conditions for reference SCOP and reference SCOPon calculation of air to water units for high temperature application for the reference heating season;

"A" = average, "W" = warmer, and "C" = colder.

Condition	Part Load Ratio				Outdoor heat exchanger		Indoor heat exchanger			
					Inlet dry (wet) bulb temperature °C		Fixed outlet °C	Variable outlet ^d °C		
	Formula	A	W	C	Outdoor air	Exhaust air	All climates	A	W	C
A	$(-7 - 16) / (T_{\text{designh}} - 16)$	88	n/a	61	-7(-8)	20(12)	^a / 55	^a / 52	n/a	^a / 44
B	$(+2 - 16) / (T_{\text{designh}} - 16)$	54	100	37	2(1)	20(12)	^a / 55	^a / 42	^a / 55	^a / 37
C	$(+7 - 16) / (T_{\text{designh}} - 16)$	35	64	24	7(6)	20(12)	^a / 55	^a / 36	^a / 46	^a / 32
D	$(+12 - 16) / (T_{\text{designh}} - 16)$	15	29	11	12(11)	20(12)	^a / 55	^a / 30	^a / 34	^a / 28
E	$(T_{\text{OL}} - 16) / (T_{\text{designh}} - 16)$				TOL	20(12)	^a / 55	^a / ^b	^a / ^b	^a / ^b
F	$(T_{\text{bivalent}} - 16) / (T_{\text{designh}} - 16)$				T _{bivalent}	20(12)	^a / 55	^a / ^c	^a / ^c	^a / ^c
G	$(-15 - 16) / (T_{\text{designh}} - 16)$	n/a	n/a	82	-15	20(12)	^a / 55	n/a	n/a	^a / 49

^a With the water flow rate as determined at the standard rating conditions given in EN 14511-2 at 47/55 conditions for units with a fixed water flow rate, and with a fixed delta T of 8 K for units with a variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum flow rate is used with the outlet temperature.

^b Variable outlet shall be calculated by interpolation T_{designh} and the temperature which is closest to the TOL.

^c Variable outlet shall be calculated by interpolation between the upper and lower temperatures which are closest to the bivalent temperature.

^d If the variable outlet temperature is below the minimum of the operation range of the unit, this minimum should be considered.

Additional information

Climate	T _{designh} [°C]	T _{bivalent} [°C]	TOL [°C]	Outlet temperature	Flow rate
Average	-10	-7	-10	Variable	Variable
Warmer	2	2	2	Variable	Variable



Part load condition	Compressor speed (Hz)		
	Average	Warmer	Colder
A	70	-	-
B	31	65	-
C	20	32	-
D	20	20	-
E(Tol)	70	65	70
F	70	65	-
G	-	-	70



SEER test conditions for fan cooling and cooling floor – EN 14825:2013

Part load conditions for reference SEER and reference SEERon calculation of air to water units.

	Part load ratio	Part load ratio %	Outdoor heat exchanger Air dry bulb temperature °C	Indoor heat exchanger		
				Fan coil application Inlet/outlet water temperatures		Cooling floor application Inlet/outlet water temperatures °C
				Fixed outlet °C	Variable outlet °C	
A	$(35-16)/(T_{designc}-16)$	100	35	12 / 7	12 / 7	23 / 18
B	$(30-16)/(T_{designc}-16)$	74	30	^a / 7	^a / 8,5	^a / 18
C	$(25-16)/(T_{designc}-16)$	47	25	^a / 7	^a / 10	^a / 18
D	$(20-16)/(T_{designc}-16)$	21	20	^a / 7	^a / 11,5	^a / 18

^a With the water flow rate as determined during "A" test for units with a fixed water flow rate or with a fixed delta T of 5 K for units with a variable water flow rate.

Additional information

Part load condition	Compressor speed (Hz)	
	Fan coil	Cooling floor
A	47	55
B	32	-
C	-	-
D	20	20



Test conditions for rating tests – space heating – EN 14511:2011

N#	Heat source		Heat sink		Compressor speed (Hz)
	Inlet dry bulb temperature (°C)	Inlet wet bulb temperature (°C)	Inlet temperature (°C)	Outlet temperature (°C)	
1	7	6	30	35	60
2	2	1	30	35	75
3	-7	-8	30	35	80

Test conditions for additional performance tests – space heating – EN 14511:2011

N#	Heat source		Heat sink		Compressor speed (Hz)
	Inlet dry bulb temperature (°C)	Inlet wet bulb temperature (°C)	Inlet temperature (°C)	Outlet temperature (°C)	
1	7	-8	52	60	60
2	-7	-8	52	60	70



Test conditions for standard rating tests - space cooling EN 14511:2011

N#	Heat source		Heat sink		Compressor speed (Hz)
	Inlet dry bulb temperature (°C)	Inlet wet bulb temperature (°C)	Inlet temperature (°C)	Outlet temperature (°C)	
1	35	-	23	18	40
2	35	-	12	7	40



Test conditions for sound power measurements – EN 12102-1:2017

N [#]	Test conditions		Heat pump settings			
	Outdoor heat exchanger (dry bulb/ wet bulb) (°C)	Indoor heat exchanger (inlet/ outlet) (°C)	Compressor speed (Hz)	Fan speed outdoor (rpm)	Heating capacity (kW)	Heat pump variant
1 ^E	7/6	47/55	23	690	4.73	10kW
2 ^M	7/6	30/35	70	690	17.0	10kW
3 ^N	7/6	47/55	31	400	6.45	10kW
4 ^M	7/6	30/35	75	690	17.7	12kW
5 ^N	7/6	47/55	37	400	7.8	12kW
6 ^E	7/6	47/55	24	690	5.05	14kW
7 ^N	7/6	47/55	45	400	9.45	14kW

E) ErP LwA, M) Max LwA and N) Max LwA Night mode



Test results

Test results of SCOP test at low temperature - heating season average – EN 14825:2013

Model (Outdoor and indoor)	Compress CS3400iAWS 14-T / Compress AWES 10 E
Air-to-water heat pump mono bloc	N
Low-temperature heat pump	N
Equipped with supplementary heater	Y
Heat pump combination heater	Y
Reversible	Y

Rated heat output¹⁾	P_{rated}	12 [kW]
Seasonal space heating energy efficiency	η_s	178.3 [%]
	SCOP	4.53 [-]

Measured capacity for heating for part load at outdoor temperature T_j	Average Climate	$T_j = -15\text{ °C}$	P_{dh}	- [kW]
	-	$T_j = -7\text{ °C}$	P_{dh}	10.98 [kW]
	Low temperature application	$T_j = 2\text{ °C}$	P_{dh}	6.71 [kW]
		$T_j = 7\text{ °C}$	P_{dh}	5.26 [kW]
		$T_j = 12\text{ °C}$	P_{dh}	6.11 [kW]
		$T_j = \text{bivalent temperature}$	P_{dh}	11.49 [kW]
		$T_j = \text{operation limit}$	P_{dh}	11.49 [kW]

Measured coefficient of performance at outdoor temperature T_j	Average Climate	$T_j = -15\text{ °C}$	COPd	- [-]
	-	$T_j = -7\text{ °C}$	COPd	2.73 [-]
	Low temperature application	$T_j = 2\text{ °C}$	COPd	4.71 [-]
		$T_j = 7\text{ °C}$	COPd	5.42 [-]
		$T_j = 12\text{ °C}$	COPd	6.76 [-]
		$T_j = \text{bivalent temperature}$	COPd	2.54 [-]
		$T_j = \text{operation limit}$	COPd	2.54 [-]

Bivalent temperature	$T_{bivalent}$	-10 [°C]
Operation limit temperatures	TOL	-10 [°C]
	WTOL	- [°C]
Degradation coefficient	C_{dh}	0.98 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.022 [kW]
	Thermostat-off mode	P_{TO}	0.022 [kW]
	Standby mode	P_{SB}	0.022 [kW]
	Crankcase heater mode	P_{CK}	0.022 [kW]
Supplementary heater¹⁾	Rated heat output	P_{SUP}	0.00 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	5471 [kWh]

¹⁾For heat pump space heaters and heat pump combination heaters, the rated heat output, P_{rated} , is equal to the design load for heating, $P_{designh}$, and the rated heat output of a supplementary heater, P_{sup} , is equal to the supplementary capacity for heating, $sup(T_j)$.



Test results of SCOP test at high temperature - heating season average – EN 14825:2013

Model (Outdoor and indoor)	Compress CS3400iAWS 14-T / Compress AWES 10 E
Air-to-water heat pump mono bloc	N
Low-temperature heat pump	N
Equipped with supplementary heater	Y
Heat pump combination heater	Y
Reversible	Y

Rated heat output¹⁾	P_{rated}	12 [kW]
Seasonal space heating energy efficiency	η_s	139.2 [%]
	SCOP	3.56 [-]

Measured capacity for heating for part load at outdoor temperature T_j	Average Climate - High temperature application	$T_j = -15\text{ °C}$	P_{dh}	- [kW]
		$T_j = -7\text{ °C}$	P_{dh}	10.26 [kW]
		$T_j = 2\text{ °C}$	P_{dh}	6.59 [kW]
		$T_j = 7\text{ °C}$	P_{dh}	5.08 [kW]
		$T_j = 12\text{ °C}$	P_{dh}	6.05 [kW]
		$T_j = \text{bivalent temperature}$	P_{dh}	9.04 [kW]
		$T_j = \text{operation limit}$	P_{dh}	9.04 [kW]

Measured coefficient of performance at outdoor temperature T_j	Average Climate - High temperature application	$T_j = -15\text{ °C}$	COP_d	- [-]
		$T_j = -7\text{ °C}$	COP_d	2.10 [-]
		$T_j = 2\text{ °C}$	COP_d	3.60 [-]
		$T_j = 7\text{ °C}$	COP_d	4.50 [-]
		$T_j = 12\text{ °C}$	COP_d	5.62 [-]
		$T_j = \text{bivalent temperature}$	COP_d	1.84 [-]
		$T_j = \text{operation limit}$	COP_d	1.84 [-]

Bivalent temperature	$T_{bivalent}$	-10 [°C]
Operation limit temperatures	TOL	-10 [°C]
	WTOL	- [°C]
Degradation coefficient	C_{dh}	0.98 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.022 [kW]
	Thermostat-off mode	P_{TO}	0.022 [kW]
	Standby mode	P_{SB}	0.022 [kW]
	Crankcase heater mode	P_{CK}	0.022 [kW]
Supplementary heater¹⁾	Rated heat output	P_{SUP}	0.00 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	6972 [kWh]

¹⁾For heat pump space heaters and heat pump combination heaters, the rated heat output, P_{rated} , is equal to the design load for heating, $P_{designh}$, and the rated heat output of a supplementary heater, P_{sup} , is equal to the supplementary capacity for heating, $sup(T_j)$.



Test results of SCOP test at low temperature - heating season warmer – EN 14825:2013

Model (Outdoor and indoor)	Compress CS3400iAWS 14-T / Compress AWES 10 E
Air-to-water heat pump mono bloc	N
Low-temperature heat pump	N
Equipped with supplementary heater	Y
Heat pump combination heater	Y
Reversible	Y

Rated heat output¹⁾	P_{rated}	12 [kW]
Seasonal space heating energy efficiency	η_s	232.1 [%]
	SCOP	5.88 [-]

Measured capacity for heating for part load at outdoor temperature T_j	Warmer Climate - Low temperature application	$T_j = -15\text{ °C}$	P_{dh}	- [kW]
		$T_j = -7\text{ °C}$	P_{dh}	- [kW]
		$T_j = 2\text{ °C}$	P_{dh}	12.19 [kW]
		$T_j = 7\text{ °C}$	P_{dh}	7.51 [kW]
		$T_j = 12\text{ °C}$	P_{dh}	6.17 [kW]
		$T_j = \text{bivalent temperature}$	P_{dh}	12.19 [kW]
		$T_j = \text{operation limit}$	P_{dh}	12.19 [kW]

Measured coefficient of performance at outdoor temperature T_j	Warmer Climate - Low temperature application	$T_j = -15\text{ °C}$	COPd	- [-]
		$T_j = -7\text{ °C}$	COPd	- [-]
		$T_j = 2\text{ °C}$	COPd	3.16 [-]
		$T_j = 7\text{ °C}$	COPd	5.38 [-]
		$T_j = 12\text{ °C}$	COPd	7.10 [-]
		$T_j = \text{bivalent temperature}$	COPd	3.16 [-]
		$T_j = \text{operation limit}$	COPd	3.16 [-]

Bivalent temperature	$T_{bivalent}$	2 [°C]
Operation limit temperatures	TOL	2 [°C]
Degradation coefficient	C_{dh}	0.97 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.022 [kW]
	Thermostat-off mode	P_{TO}	0.022 [kW]
	Standby mode	P_{SB}	0.022 [kW]
	Crankcase heater mode	P_{CK}	0.022 [kW]
Supplementary heater¹⁾	Rated heat output	P_{SUP}	0.00 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	2728 [kWh]

¹⁾For heat pump space heaters and heat pump combination heaters, the rated heat output, P_{rated} , is equal to the design load for heating, $P_{designh}$, and the rated heat output of a supplementary heater, P_{sup} , is equal to the supplementary capacity for heating, $sup(T_j)$.



Test results of SCOP test at high temperature - heating season warmer - EN 14825:2013

Model (Outdoor and indoor)	Compress CS3400iAWS 14-T / Compress AWES 10 E
Air-to-water heat pump mono bloc	N
Low-temperature heat pump	N
Equipped with supplementary heater	Y
Heat pump combination heater	Y
Reversible	Y

Rated heat output¹⁾	P_{rated}	12 [kW]
Seasonal space heating energy efficiency	η_s	170.6 [%]
	SCOP	4.34 [-]

Measured capacity for heating for part load at outdoor temperature T_j	Warmer Climate - High temperature application	$T_j = -15\text{ °C}$	P_{dh}	- [kW]
		$T_j = -7\text{ °C}$	P_{dh}	- [kW]
		$T_j = 2\text{ °C}$	P_{dh}	11.85 [kW]
		$T_j = 7\text{ °C}$	P_{dh}	7.67 [kW]
		$T_j = 12\text{ °C}$	P_{dh}	5.93 [kW]
		$T_j = \text{bivalent temperature}$	P_{dh}	11.85 [kW]
		$T_j = \text{operation limit}$	P_{dh}	11.85 [kW]

Measured coefficient of performance at outdoor temperature T_j	Warmer Climate - High temperature application	$T_j = -15\text{ °C}$	COPd	- [-]
		$T_j = -7\text{ °C}$	COPd	- [-]
		$T_j = 2\text{ °C}$	COPd	2.38 [-]
		$T_j = 7\text{ °C}$	COPd	3.75 [-]
		$T_j = 12\text{ °C}$	COPd	5.50 [-]
		$T_j = \text{bivalent temperature}$	COPd	2.38 [-]
		$T_j = \text{operation limit}$	COPd	2.38 [-]

Bivalent temperature	$T_{bivalent}$	2 [°C]
Operation limit temperatures	TOL	2 [°C]
	WTOL	- [°C]
Degradation coefficient	C_{dh}	0.98 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.022 [kW]
	Thermostat-off mode	P_{TO}	0.022 [kW]
	Standby mode	P_{SB}	0.022 [kW]
	Crankcase heater mode	P_{CK}	0.022 [kW]
Supplementary heater¹⁾	Rated heat output	P_{SUP}	0.00 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	3693 [kWh]

¹⁾For heat pump space heaters and heat pump combination heaters, the rated heat output, P_{rated} , is equal to the design load for heating, $P_{designh}$, and the rated heat output of a supplementary heater, P_{sup} , is equal to the supplementary capacity for heating, $sup(T_j)$.



Test results of SCOP test points at low temperature and colder climate – EN 14825:2013

N#	SCOP test points	Test conditions	Heating capacity [kW]	COP
1	A	A-7W30	7.62	3.56
2	C	A7W25	5.26	5.45
3	E	A-20W34.1	8.69	2.06
4	G	A-15W32	10.18	2.42

Test results of SCOP test points at high temperature and colder climate – EN 14825:2013

N#	SCOP test points	Test conditions	Heating capacity [kW]	COP
1	E	A-17W50.7	7.41	1.59
2	G	A-15W49	8.31	1.88



Test results of SEER test - fan cooling – EN 14825:2013

Model (Outdoor and indoor)	Compress CS3400iAWS 14-T / Compress AWES 10 E
Air-to-water heat pump mono bloc	N
Low-temperature heat pump	N
Equipped with supplementary heater	Y
Heat pump combination heater	Y
Reversible	Y

Design load	P _{designc}	6.42 [kW]
Seasonal efficiency	SEER	2.90 [-]

Measured capacity for cooling for part load at outdoor temperature T_j	Fan cooling			-
		T _j =35°C	P _{dc}	6.42 [kW]
		T _j =30°C	P _{dc}	4.96 [kW]
		T _j =25 °C	P _{dc}	2.98 [kW]
		T _j =20 °C	P _{dc}	2.48 [kW]
				-

Measured energy efficiency ratio for cooling for part load at outdoor temperature T_j	Fan cooling			-
		T _j =35°C	EER _d	2.32 [-]
		T _j =30°C	EER _d	2.97 [-]
		T _j =25 °C	EER _d	3.39 [-]
		T _j =20 °C	EER _d	3.11 [-]
				-

Power consumption in modes other than active mode	Off mode	P _{OFF}	0.022 [kW]
	Thermostat-off mode	P _{TO}	0.022 [kW]
	Standby mode	P _{SB}	0.022 [kW]
	Crankcase heater mode	P _{CK}	0.022 [kW]

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Degradation coefficient	C _{dc}	0.97 [-]
	Annual energy consumption	Q _{CE}	775 [kWh]



Test results of SEER test - cooling floor– EN 14825:2013

Model (Outdoor and indoor)	Compress CS3400iAWS 14-T / Compress AWES 10 E
Air-to-water heat pump mono bloc	N
Low-temperature heat pump	N
Equipped with supplementary heater	Y
Heat pump combination heater	Y
Reversible	Y

Design load	P _{designc}	10 [kW]
Seasonal efficiency	SEER	4.96 [-]

Measured capacity for cooling for part load at outdoor temperature T_j	Cooling floor			-
		T _j =35°C	P _{dc}	10.11 [kW]
		T _j =30°C	P _{dc}	7.45 [kW]
		T _j =25 °C	P _{dc}	5.06 [kW]
		T _j =20 °C	P _{dc}	4.33 [kW]
				-

Measured energy efficiency ratio for cooling for part load at outdoor temperature T_j	Cooling floor			-
		T _j =35°C	EER _d	2.84 [-]
		T _j =30°C	EER _d	4.96 [-]
		T _j =25 °C	EER _d	5.73 [-]
		T _j =20 °C	EER _d	6.64 [-]
				-

Power consumption in modes other than active mode	Off mode	P _{OFF}	0.022 [kW]
	Thermostat-off mode	P _{TO}	0.022 [kW]
	Standby mode	P _{SB}	0.022 [kW]
	Crankcase heater mode	P _{CK}	0.022 [kW]

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Degradation coefficient	C _{dc}	0.97 [-]
	Annual energy consumption	Q _{CE}	706 [kWh]



Test results for rating condition test – space heating – EN 14511:2011

N#	Test conditions	Heating capacity [kW]	COP
1	A7W35	14.58	4.28
2	A2W35	12.19	3.16
3	A-7W35	11.3	2.62

Test results for additional performance test – space heating – EN 14511:2011

N#	Test conditions	Heating capacity [kW]	COP
1	A-7W60	9.16	1.71
2	A7W60	8.85	2.44

Test results for standard rating condition test – space cooling – EN 14511:2011

N#	Test conditions	Heating capacity [kW]	COP
1	A35W18	7.98	3.48
2	A35W7	5.76	2.55



Test results of sound power measurements – EN 12102-1:2017

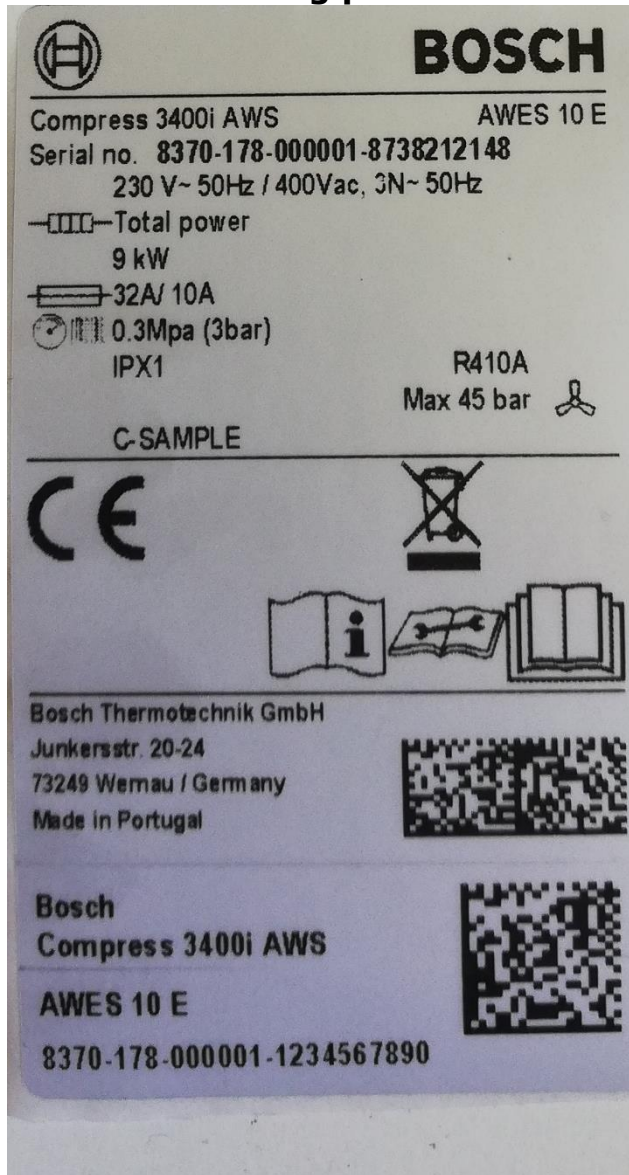
N [#]	Heat pump variant	Sound power level LW(A) [dB re 1pW]	Uncertainty (dB) (weighted value)
1 ^E	10kW	64.1	0.5
2 ^M	10kW	65.5	0.5
3 ^N	10kW	54.6	0.5
4 ^M	12kW	68.1	1.0
5 ^N	12kW	55.4	1.0
6 ^E	14kW	64.4	0.5
7 ^N	14kW	58.4	1.0

E) ErP LwA, M) Max LwA and N) Max LwA Night mode

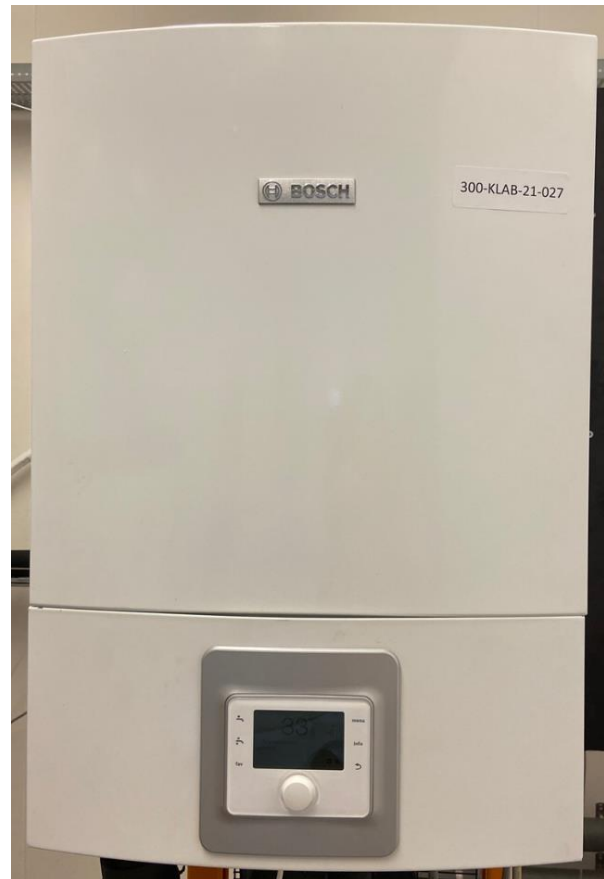


Photo

Indoor unit rating plate




Indoor unit





Outdoor unit rating plate

 **BOSCH**

Compress 3400i AWS CS3400iAWS 14-T
S/N: 3700-140-000006-8750722688

A2/W35
A7/W35
A35/W7
A35/W18
-20 / +45 °C
+10 / +45 °C
PS H 45 bar
R410A (GWP 2088) / 3,20 kg / 7,31 tCO₂eq
kg / tCO₂eq
3~NPE, 400VAC, 50Hz / 20A (C)
IP 24 / 118,0 kg

WARNING!
Contains fluorinated greenhouse gases covered by the Kyoto Protocol
Appliance shall be installed, operated and stored in a room with a floor area larger than "x" m²

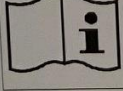
Additional Charge per Pipe Length	Floor Area "x" m ²	0 or NO RESTRICTION
5-12,5m	NO RESTRICTION	
12,5-30m	60 at/m	
30m+	NO RESTRICTION	

CAUTION!
1. Ensure proper air evacuation from pipes using vacuum pump.
2. Make sure the proper added refrigerant charge according to the pipe size and length, please refer to the INSTALLATION INSTRUCTION for details.
3. Ignoring these instruction may lead to serious malfunction and safety hazard.

Instructions for added refrigerant:
1= Basic Charge by manufacturer; 2=Additional Charge to be added; 1+2= Total Amount.
Installer should fill in the boxes for 2 and 1+2

R410A


1 =	3,2	kg
2 =		kg
1+2 =		kg



sn 4611744129

CE

Bosch Thermotechnik GmbH
Junkerstr. 20/24
73249 Wernau / Germany
Made in Israel



Outdoor unit





SCOP - detailed calculation

Detailed SCOP calculation of low temperature and average climate conditions – EN 14825:2013

Calculation of reference SCOP

$$SCOP = \frac{P_{designh} \times H_{he}}{\frac{P_{designh} \times H_{he}}{SCOP_{en}} + H_{TO} \times P_{TO} + H_{SB} \times P_{SB} + H_{CK} \times P_{CK} + H_{OFF} \times P_{OFF}}$$

Where

P_{design} =

Heating load of the building at design temperature, kW

H_{he} =

Number of equivalent heating hours, 2066 h

H_{TO} , H_{SB} , H_{CK} , H_{OFF} =

Number of hours for which the unit is considered to work in thermostat off mode, standby mode, crankcase heater mode and off mode, h, respectively

P_{TO} , P_{SB} , P_{CK} , P_{OFF} =

Electricity consumption during thermostat off mode, standby mode, crankcase heater mode and off mode, kW, respectively

Data for SCOP

	Outdoor temperature [°C]	Part load ratio [%]	Part load [kW]	Declared capacity [kW]	Declared COP [-]	cdh [-]	CR [-]	COPbin [-]
A	-7	88	10.62	10.98	2.73	0.99	1.00	2.73
B	2	54	6.46	6.71	4.71	0.98	1.00	4.71
C	7	35	4.15	5.26	5.42	0.98	0.79	5.39
D	12	15	1.85	6.11	6.76	0.98	0.30	6.40
E	-10	100	12.00	11.49	2.54	1.00	1.00	2.54
F - BIV	-10	100	12.00	11.49	2.54	1.00	1.00	2.54

Energy consumption for thermostat off, standby, off mode, crankcase heater mode

	Hours [h]	Power input [kW]	Applied to SCOP calculation [kW]	Energy consumption [kWh]
Off mode	0	0.022	0.022	0
Thermostat off	178	0.022	0	0
Standby	0	0.022	0.022	0
Crankcase heater	178	0.022	0	0



Calculation Bin for SCOPon

	Bin	Outdoor temperature [°C]	Hours [h]	Heat load [kW]	Heat load covered by heat pump [kW]	Electrical back up heater [kW]	Annual backup heater energy input [kWh]	COPbin	Annual heating demand [kWh]	Annual energy input [kWh]	Net annual heating capacity [kWh]	Net annual power input [kWh]
E / F - BIV	21	-10	1	12.00	11.49	0.00	0.00	2.54	12.00	4.72	12.00	4.72
	22	-9	25	11.54	11.20	0.00	0.00	2.60	288.46	110.80	288.46	110.80
	23	-8	23	11.08	10.91	0.00	0.00	2.67	254.77	95.54	254.77	95.54
A	24	-7	24	10.62	10.62	0.00	0.00	2.73	254.77	93.32	254.77	93.32
	25	-6	27	10.15	10.15	0.00	0.00	2.95	274.15	92.93	274.15	92.93
	26	-5	68	9.69	9.69	0.00	0.00	3.17	659.08	207.91	659.08	207.91
	27	-4	91	9.23	9.23	0.00	0.00	3.39	840.00	247.79	840.00	247.79
	28	-3	89	8.77	8.77	0.00	0.00	3.61	780.46	216.19	780.46	216.19
	29	-2	165	8.31	8.31	0.00	0.00	3.83	1370.77	357.90	1370.77	357.90
	30	-1	173	7.85	7.85	0.00	0.00	4.05	1357.38	335.16	1357.38	335.16
	31	0	240	7.38	7.38	0.00	0.00	4.27	1772.31	415.06	1772.31	415.06
	32	1	280	6.92	6.92	0.00	0.00	4.49	1938.46	431.73	1938.46	431.73
B	33	2	320	6.46	6.46	0.00	0.00	4.71	2067.69	439.00	2067.69	439.00
	34	3	357	6.00	6.00	0.00	0.00	4.85	2142.00	442.06	2142.00	442.06
	35	4	356	5.54	5.54	0.00	0.00	4.98	1971.69	395.84	1971.69	395.84
	36	5	303	5.08	5.08	0.00	0.00	5.12	1538.31	300.66	1538.31	300.66
	37	6	330	4.62	4.62	0.00	0.00	5.25	1523.08	290.00	1523.08	290.00
C	38	7	326	4.15	4.15	0.00	0.00	5.39	1354.15	251.35	1354.15	251.35
	39	8	348	3.69	3.69	0.00	0.00	5.59	1284.92	229.86	1284.92	229.86
	40	9	335	3.23	3.23	0.00	0.00	5.79	1082.31	186.84	1082.31	186.84
	41	10	315	2.77	2.77	0.00	0.00	6.00	872.31	145.50	872.31	145.50
	42	11	215	2.31	2.31	0.00	0.00	6.20	496.15	80.06	496.15	80.06
D	43	12	169	1.85	1.85	0.00	0.00	6.40	312.00	48.75	312.00	48.75
	44	13	151	1.38	1.38	0.00	0.00	6.60	209.08	31.67	209.08	31.67
	45	14	105	0.92	0.92	0.00	0.00	6.81	96.92	14.24	96.92	14.24
	46	15	74	0.46	0.46	0.00	0.00	7.01	34.15	4.87	34.15	4.87

SUM	24787.38	5469.77	24787.38	5469.77
SCOPon	4.53		SCOPnet	4.53



Detailed SCOP calculation of high temperature and average climate conditions – EN 14825:2013

Calculation of reference SCOP

$$SCOP = \frac{P_{designh} \times H_{he}}{\frac{P_{designh} \times H_{he}}{SCOP_{en}} + H_{TO} \times P_{TO} + H_{SB} \times P_{SB} + H_{CK} \times P_{CK} + H_{OFF} \times P_{OFF}}$$

Where

P_{design} = Heating load of the building at design temperature, kW

H_{he} = Number of equivalent heating hours, 2066 h

H_{TO} , H_{SB} , H_{CK} , H_{OFF} = Number of hours for which the unit is considered to work in thermostat off mode, standby mode, crankcase heater mode and off mode, h, respectively

P_{TO} , P_{SB} , P_{CK} , P_{OFF} = Electricity consumption during thermostat off mode, standby mode, crankcase heater mode and off mode, kW, respectively

Data for SCOP

	Outdoor temperature [°C]	Part load ratio [%]	Part load [kW]	Declared capacity [kW]	Declared COP [-]	cdh [-]	CR [-]	COPbin [-]
A	-7	88	10.62	10.26	2.10	1.00	1.00	2.10
B	2	54	6.46	6.59	3.60	0.99	1.00	3.60
C	7	35	4.15	5.08	4.50	0.98	0.82	4.48
D	12	15	1.85	6.05	5.62	0.98	0.31	5.37
E	-10	100	12.00	9.04	1.84	1.00	1.00	1.84
F - BIV	-10	100	12.00	9.04	1.84	1.00	1.00	1.84

Energy consumption for thermostat off, standby, off mode, crankcase heater mode

	Hours [h]	Power input [kW]	Applied to SCOP calculation [kW]	Energy consumption [kWh]
Off mode	0	0.022	0.022	0
Thermostat off	178	0.022	0	0
Standby	0	0.022	0.022	0
Crankcase heater	178	0.022	0	0



Calculation Bin for SCOPon

	Bin	Outdoor temperature [°C]	Hours [h]	Heat load [kW]	Heat load covered by heat pump [kW]	Electrical back up heater [kW]	Annual backup heater energy input [kWh]	COPbin	Annual heating demand [kWh]	Annual energy input [kWh]	Net annual heating capacity [kWh]	Net annual power input [kWh]
E / F - BIV	21	-10	1	12.00	9.04	0.00	0.00	1.84	12.00	6.52	12.00	6.52
	22	-9	25	11.54	9.45	0.00	0.00	1.93	288.46	149.72	288.46	149.72
	23	-8	23	11.08	9.85	0.00	0.00	2.01	254.77	126.54	254.77	126.54
A	24	-7	24	10.62	10.26	0.00	0.00	2.10	254.77	121.32	254.77	121.32
	25	-6	27	10.15	9.84	0.00	0.00	2.27	274.15	120.95	274.15	120.95
	26	-5	68	9.69	9.42	0.00	0.00	2.43	659.08	270.85	659.08	270.85
	27	-4	91	9.23	8.99	0.00	0.00	2.60	840.00	323.08	840.00	323.08
	28	-3	89	8.77	8.57	0.00	0.00	2.77	780.46	282.09	780.46	282.09
	29	-2	165	8.31	8.15	0.00	0.00	2.93	1370.77	467.31	1370.77	467.31
	30	-1	173	7.85	7.73	0.00	0.00	3.10	1357.38	437.87	1357.38	437.87
	31	0	240	7.38	7.31	0.00	0.00	3.27	1772.31	542.54	1772.31	542.54
	32	1	280	6.92	6.88	0.00	0.00	3.43	1938.46	564.60	1938.46	564.60
B	33	2	320	6.46	6.46	0.00	0.00	3.60	2067.69	574.36	2067.69	574.36
	34	3	357	6.00	6.00	0.00	0.00	3.78	2142.00	567.25	2142.00	567.25
	35	4	356	5.54	5.54	0.00	0.00	3.95	1971.69	498.88	1971.69	498.88
	36	5	303	5.08	5.08	0.00	0.00	4.13	1538.31	372.62	1538.31	372.62
	37	6	330	4.62	4.62	0.00	0.00	4.30	1523.08	353.84	1523.08	353.84
C	38	7	326	4.15	4.15	0.00	0.00	4.48	1354.15	302.23	1354.15	302.23
	39	8	348	3.69	3.69	0.00	0.00	4.66	1284.92	275.83	1284.92	275.83
	40	9	335	3.23	3.23	0.00	0.00	4.84	1082.31	223.79	1082.31	223.79
	41	10	315	2.77	2.77	0.00	0.00	5.01	872.31	173.96	872.31	173.96
	42	11	215	2.31	2.31	0.00	0.00	5.19	496.15	95.56	496.15	95.56
D	43	12	169	1.85	1.85	0.00	0.00	5.37	312.00	58.10	312.00	58.10
	44	13	151	1.38	1.38	0.00	0.00	5.55	209.08	37.68	209.08	37.68
	45	14	105	0.92	0.92	0.00	0.00	5.73	96.92	16.93	96.92	16.93
	46	15	74	0.46	0.46	0.00	0.00	5.90	34.15	5.79	34.15	5.79

SUM	24787.38	6970.21	24787.38	6970.21
SCOPon		3.56	SCOPnet	3.56



Detailed SCOP calculation of low temperature and warmer climate conditions – EN 14825:2013

Calculation of reference SCOP

$$SCOP = \frac{P_{designh} \times H_{he}}{\frac{P_{designh} \times H_{he}}{SCOP_{en}} + H_{TO} \times P_{TO} + H_{SB} \times P_{SB} + H_{CK} \times P_{CK} + H_{OFF} \times P_{OFF}}$$

Where

P_{design} =	Heating load of the building at design temperature, kW
H_{he} =	Number of equivalent heating hours, 1336 h
H_{TO} , H_{SB} , H_{CK} , H_{OFF} =	Number of hours for which the unit is considered to work in thermostat off mode, standby mode, crankcase heater mode and off mode, h, respectively
P_{TO} , P_{SB} , P_{CK} , P_{OFF} =	Electricity consumption during thermostat off mode, standby mode, crankcase heater mode and off mode, kW, respectively

Data for SCOP

	Outdoor temperature [°C]	Part load ratio [%]	Part load [kW]	Declared capacity [kW]	Declared COP [-]	cdh [-]	CR [-]	COPbin [-]
B	2	100	12.00	12.19	3.16	0.99	1.00	3.16
C	7	64	7.71	7.51	5.38	0.98	1.00	5.38
D	12	29	3.43	6.17	7.10	0.97	0.56	6.96
E	2	100	12.00	12.19	3.16	0.99	1.00	3.16
F - BIV	2	100	12.00	12.19	3.16	0.99	1.00	3.16

Energy consumption for thermostat off, standby, off mode, crankcase heater mode

	Hours [h]	Power input [kW]	Applied to SCOP calculation [kW]	Energy consumption [kWh]
Off mode	0	0.022	0.022	0
Thermostat off	754	0.022	0	0
Standby	0	0.022	0.022	0
Crankcase heater	754	0.022	0	0



Calculation Bin for SCOPon

	Bin	Outdoor temperature	Hours	Heat load	Heat load covered by heat pump	Electrical back up heater	Annual backup heater energy input	COP _{bin}	Annual heating demand	Annual energy input	Net annual heating capacity	Net annual power input
	[-]	[°C]	[h]	[kW]	[kW]	[kW]	[kWh]	[-]	[kWh]	[kWh]	[kWh]	[kWh]
B / E / F - BIV	33	2	3	12.00	12.00	0.00	0.00	3.16	36.00	11.39	36.00	11.39
	34	3	22	11.14	11.10	0.00	0.00	3.60	245.14	68.02	245.14	68.02
	35	4	63	10.29	10.20	0.00	0.00	4.05	648.00	160.08	648.00	160.08
	36	5	63	9.43	9.31	0.00	0.00	4.49	594.00	132.24	594.00	132.24
	37	6	175	8.57	8.41	0.00	0.00	4.94	1500.00	303.89	1500.00	303.89
C	38	7	162	7.71	7.51	0.00	0.00	5.38	1249.71	232.29	1249.71	232.29
	39	8	259	6.86	6.69	0.00	0.00	5.70	1776.00	311.81	1776.00	311.81
	40	9	360	6.00	5.88	0.00	0.00	6.01	2160.00	359.30	2160.00	359.30
	41	10	428	5.14	5.06	0.00	0.00	6.33	2201.14	347.87	2201.14	347.87
	42	11	430	4.29	4.24	0.00	0.00	6.64	1842.86	277.40	1842.86	277.40
D	43	12	503	3.43	3.43	0.00	0.00	6.96	1724.57	247.81	1724.57	247.81
	44	13	444	2.57	2.61	0.00	0.00	7.27	1141.71	156.94	1141.71	156.94
	45	14	384	1.71	1.80	0.00	0.00	7.59	658.29	86.72	658.29	86.72
	46	15	294	0.86	0.98	0.00	0.00	7.91	252.00	31.87	252.00	31.87

SUM	16029.43	2727.63	16029.43	2727.63
SCOPon	5.88		SCOPnet	5.88



Detailed SCOP calculation of high temperature and warmer climate conditions – EN 14825:2013

Calculation of reference SCOP

$$SCOP = \frac{P_{designh} \times H_{he}}{\frac{P_{designh} \times H_{he}}{SCOP_{on}} + H_{TO} \times P_{TO} + H_{SB} \times P_{SB} + H_{CK} \times P_{CK} + H_{OFF} \times P_{OFF}}$$

Where

P_{design} =	Heating load of the building at design temperature, kW
H_{he} =	Number of equivalent heating hours, 1336 h
$H_{TO}, H_{SB}, H_{CK}, H_{OFF}$ =	Number of hours for which the unit is considered to work in thermostat off mode, standby mode, crankcase heater mode and off mode, h, respectively
$P_{TO}, P_{SB}, P_{CK}, P_{OFF}$ =	Electricity consumption during thermostat off mode, standby mode, crankcase heater mode and off mode, kW, respectively

Data for SCOP

	Outdoor temperature [°C]	Part load ratio [%]	Part load [kW]	Declared capacity [kW]	Declared COP [-]	cdh [-]	CR [-]	COPbin [-]
B	2	100	12.00	11.85	2.38	1.00	1.00	2.38
C	7	64	7.71	7.67	3.75	0.99	1.00	3.75
D	12	29	3.43	5.93	5.50	0.98	0.58	5.42
E	2	100	12.00	11.85	2.38	1.00	1.00	2.38
F - BIV	2	100	12.00	11.85	2.38	1.00	1.00	2.38

Energy consumption for thermostat off, standby, off mode, crankcase heater mode

	Hours [h]	Power input [kW]	Applied to SCOP calculation [kW]	Energy consumption [kWh]
Off mode	0	0.022	0.022	0
Thermostat off	754	0.022	0	0
Standby	0	0.022	0.022	0
Crankcase heater	754	0.022	0	0



Calculation Bin for SCOPon

	Bin	Outdoor temperature	Hours	Heat load	Heat load covered by heat pump	Electrical back up heater	Annual backup heater energy input	COPbin	Annual heating demand	Annual energy input	Net annual heating capacity	Net annual power input
	[-]	[°C]	[h]	[kW]	[kW]	[kW]	[kWh]	[-]	[kWh]	[kWh]	[kWh]	[kWh]
B / E / F - BIV	33	2	3	12.00	11.85	0.00	0.00	2.38	36.00	15.13	36.00	15.13
	34	3	22	11.14	11.01	0.00	0.00	2.65	245.14	92.37	245.14	92.37
	35	4	63	10.29	10.18	0.00	0.00	2.93	648.00	221.31	648.00	221.31
	36	5	63	9.43	9.34	0.00	0.00	3.20	594.00	185.51	594.00	185.51
	37	6	175	8.57	8.51	0.00	0.00	3.48	1500.00	431.53	1500.00	431.53
C	38	7	162	7.71	7.67	0.00	0.00	3.75	1249.71	333.26	1249.71	333.26
	39	8	259	6.86	6.82	0.00	0.00	4.08	1776.00	434.88	1776.00	434.88
	40	9	360	6.00	5.97	0.00	0.00	4.42	2160.00	488.94	2160.00	488.94
	41	10	428	5.14	5.13	0.00	0.00	4.75	2201.14	463.24	2201.14	463.24
	42	11	430	4.29	4.28	0.00	0.00	5.09	1842.86	362.38	1842.86	362.38
D	43	12	503	3.43	3.43	0.00	0.00	5.42	1724.57	318.23	1724.57	318.23
	44	13	444	2.57	2.58	0.00	0.00	5.75	1141.71	198.45	1141.71	198.45
	45	14	384	1.71	1.73	0.00	0.00	6.09	658.29	108.15	658.29	108.15
	46	15	294	0.86	0.88	0.00	0.00	6.42	252.00	39.25	252.00	39.25

SUM	16029.43	3692.61	16029.43	3692.61
SCOPon	4.34		SCOPnet	4.34



Detailed SEER calculation of fan cooling – EN 14825:2013

Calculation of reference SEER

$$SEER = \frac{P_{designc} \times H_{CE}}{\frac{P_{designc} \times H_{CE}}{SEER_{on}} + H_{TO} \times P_{TO} + H_{SB} \times P_{SB} + H_{CK} \times P_{CK} + H_{OFF} \times P_{OFF}}$$

Where

$P_{designc}$ =

Cooling load of the building at design temperature, kW

H_{CE} =

Number of equivalent heating hours, 350 h

H_{TO} , H_{SB} , H_{CK} , H_{OFF} =

Number of hours for which the unit is considered to work in thermostat off mode, standby mode, crankcase heater mode and off mode, h, respectively

P_{TO} , P_{SB} , P_{CK} , P_{OFF} =

Electricity consumption during thermostat off mode, standby mode, crankcase heater mode and off mode, kW, respectively

Data for SEER

	Outdoor temperature [°C]	Part load ratio [%]	Part load [kW]	Declared capacity [kW]	Declared EER [-]	cdc [-]	CR [-]	EERbin [-]
A	35	100	6.42	6.42	2.32	0.99	1.00	2.32
B	30	74	4.73	4.96	2.97	0.99	1.00	2.97
C	25	47	3.04	2.98	3.39	0.97	1.00	3.39
D	20	21	1.35	2.48	3.11	0.97	0.54	3.04

Energy consumption for thermostat off, standby, off mode, crankcase heater mode

	Hours [h]	Power input [kW]	Applied to SCOP calculation [kW]	Energy consumption [kWh]
Off mode	0	0.022	0.022	0
Thermostat off	221	0.022	0	0
Standby	2142	0.022	0.022	47.124
Crankcase heater	2672	0.022	0	0



Calculation Bin for SEERon

	Bin [-]	Outdoor temperature [°C]	Hours [h]	Cooling load [kW]	EERbin [-]	Annual cooling demand [kWh]	Annual energy input [kWh]
	1	17	205	0.34	3.04	69.27	22.79
	2	18	227	0.68	3.04	153.40	50.46
	3	19	225	1.01	3.04	228.08	75.03
D	4	20	225	1.35	3.04	304.11	100.04
	5	21	216	1.69	3.11	364.93	117.34
	6	22	215	2.03	3.18	435.88	137.07
	7	23	218	2.37	3.25	515.63	158.65
	8	24	197	2.70	3.32	532.52	160.40
C	9	25	178	3.04	3.39	541.31	159.68
	10	26	158	3.38	3.31	533.87	161.49
	11	27	137	3.72	3.22	509.21	158.04
	12	28	109	4.05	3.14	441.97	140.84
	13	29	88	4.39	3.05	386.55	126.57
B	14	30	63	4.73	2.97	298.02	100.34
	15	31	39	5.07	2.84	197.67	69.60
	16	32	31	5.41	2.71	167.60	61.84
	17	33	24	5.74	2.58	137.86	53.43
	18	34	17	6.08	2.45	103.40	42.20
A	19	35	13	6.42	2.32	83.46	35.97
	20	36	9	6.76	2.32	60.82	26.22
	21	37	4	7.10	2.32	28.38	12.23
	22	38	3	7.43	2.32	22.30	9.61
	23	39	1	7.77	2.32	7.77	3.35
	24	40	0	8.11	2.32	0.00	0.00

SUM	6124.00	1983.21
SEERon		3.09



Detailed SEER calculation of cooling floor – EN 14825:2013

Calculation of reference SEER

$$SEER = \frac{P_{designc} \times H_{CE}}{\frac{P_{designc} \times H_{CE}}{SEER_{on}} + H_{TO} \times P_{TO} + H_{SB} \times P_{SB} + H_{CK} \times P_{CK} + H_{OFF} \times P_{OFF}}$$

Where

$P_{designc}$ =

Cooling load of the building at design temperature, kW

H_{CE} =

Number of equivalent cooling hours, 350 h

H_{TO} , H_{SB} , H_{CK} , H_{OFF} =

Number of hours for which the unit is considered to work in thermostat off mode, standby mode, crankcase heater mode and off mode, h, respectively

P_{TO} , P_{SB} , P_{CK} , P_{OFF} =

Electricity consumption during thermostat off mode, standby mode, crankcase heater mode and off mode, kW, respectively

Data for SEER

	Outdoor temperature [°C]	Part load ratio [%]	Part load [kW]	Declared capacity [kW]	Declared EER [-]	cdc [-]	CR [-]	EERbin [-]
A	35	100	10.00	10.11	2.84	0.99	1.00	2.84
B	30	74	7.37	7.45	4.96	0.99	1.00	4.96
C	25	47	4.74	5.06	5.73	0.98	1.00	5.73
D	20	21	2.11	4.33	6.64	0.97	0.49	6.41

Energy consumption for thermostat off, standby, off mode, crankcase heater mode

	Hours [h]	Power input [kW]	Applied to SEER calculation [kW]	Energy consumption [kWh]
Off mode	0	0.022	0.022	0
Thermostat off	221	0.022	0	0
Standby	2142	0.022	0.022	47.124
Crankcase heater	2672	0.022	0	0



Calculation Bin for SEERon

	Bin [-]	Outdoor temperature [°C]	Hours [h]	Cooling load [kW]	EERbin [-]	Annual cooling demand [kWh]	Annual energy input [kWh]
	1	17	205	0.53	6.41	107.89	16.83
	2	18	227	1.05	6.41	238.95	37.27
	3	19	225	1.58	6.41	355.26	55.41
D	4	20	225	2.11	6.41	473.68	73.88
	5	21	216	2.63	6.28	568.42	90.58
	6	22	215	3.16	6.14	678.95	110.60
	7	23	218	3.68	6.00	803.16	133.80
	8	24	197	4.21	5.87	829.47	141.40
C	9	25	178	4.74	5.73	843.16	147.15
	10	26	158	5.26	5.58	831.58	149.14
	11	27	137	5.79	5.42	793.16	146.29
	12	28	109	6.32	5.27	688.42	130.68
	13	29	88	6.84	5.11	602.11	117.74
B	14	30	63	7.37	4.96	464.21	93.59
	15	31	39	7.89	4.54	307.89	67.88
	16	32	31	8.42	4.11	261.05	63.49
	17	33	24	8.95	3.69	214.74	58.23
	18	34	17	9.47	3.26	161.05	49.34
A	19	35	13	10.00	2.84	130.00	45.77
	20	36	9	10.53	2.84	94.74	33.36
	21	37	4	11.05	2.84	44.21	15.57
	22	38	3	11.58	2.84	34.74	12.23
	23	39	1	12.11	2.84	12.11	4.26
	24	40	0	12.63	2.84	0.00	0.00

SUM	9538.95	1794.47
SEERon		5.32



Detailed test results

Detailed SCOP test results - low temperature application and average climate conditions - EN 14825:2013

Detailed result for 'EN 14825:2013' Average Low (A) A-7/W34		
Tested according to:		EN 14825:2013
Climate zone:		Average
Temperature application:		Low
Condition name:		A
Condition temperature:	°C	2
Part load:	%	54%
Chosen Tbivalent	°C	-10
Tdesign	°C	-10
Pdesign	kW	12.00
Heating demand:	kW	6.46
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Transient
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	10.98
COP	-	2.73
Power consumption	kW	4.01
Measured		
Heating capacity	kW	11.02
COP	-	2.72
Power consumption	kW	4.06
During heating		
Air temperature dry bulb	°C	-7.0
Air temperature wet bulb	°C	-8.0
Inlet temperature	°C	29.0
Outlet temperature	°C	34.1
Outlet temperature (Time averaged)	°C	32.0
Flow	l/h	1992
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	381
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.044



Detailed result for 'EN 14825:2013' Average Low (B) A2/W30		
Tested according to:		EN 14825:2013
Climate zone:		Average
Temperature application:		Low
Condition name:		B
Condition temperature:	°C	2
Part load:	%	54%
Chosen Tbivalent	°C	-10
Tdesign	°C	-10
Pdesign	kW	12.00
Heating demand:	kW	6.46
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	6.71
COP	-	4.71
Power consumption	kW	1.42
Measured		
Heating capacity	kW	6.74
COP	-	4.63
Power consumption	kW	1.45
During heating		
Air temperature dry bulb	°C	2.2
Air temperature wet bulb	°C	1.1
Inlet temperature	°C	25.0
Outlet temperature	°C	30.0
Outlet temperature (Time averaged)	°C	30.0
Flow	l/h	1150
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	234
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.031



Detailed result for 'EN 14825:2013' Average Low (C) A7/W27		
Tested according to:		EN 14825:2013
Climate zone:		Average
Temperature application:		Low
Condition name:		C
Condition temperature:	°C	7
Part load:	%	35%
Chosen Tbivalent	°C	-10
Tdesign	°C	-10
Pdesign	kW	12.00
Heating demand:	kW	4.15
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	5.26
COP	-	5.42
Power consumption	kW	0.97
Measured		
Heating capacity	kW	5.28
COP	-	5.30
Power consumption	kW	1.00
During heating		
Air temperature dry bulb	°C	7.0
Air temperature wet bulb	°C	6.0
Inlet temperature	°C	23.0
Outlet temperature	°C	28.1
Outlet temperature (Time averaged)	°C	27.0
Flow	l/h	908
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	215
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.026



Detailed result for 'EN 14825:2013' Average Low (D) A12/W24		
Tested according to:		EN 14825:2013
Climate zone:		Average
Temperature application:		Low
Condition name:		D
Condition temperature:	°C	12
Part load:	%	15%
Chosen Tbivalent	°C	-10
Tdesign	°C	-10
Pdesign	kW	12.00
Heating demand:	kW	1.85
CR:	-	0
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	6.11
COP	-	6.76
Power consumption	kW	0.90
Measured		
Heating capacity	kW	6.14
COP	-	6.58
Power consumption	kW	0.93
During heating		
Air temperature dry bulb	°C	12.0
Air temperature wet bulb	°C	11.0
Inlet temperature	°C	22.5
Outlet temperature	°C	27.5
Outlet temperature (Time averaged)	°C	24.0
Flow	l/h	1057
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	173
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.029



Detailed result for 'EN 14825:2013' Average Low (E and F) A-10/W35		
Tested according to:		EN 14825:2013
Climate zone:		Average
Temperature application:		Low
Condition name:		E and F
Condition temperature:	°C	-10
Part load:	%	100%
Chosen Tbivalent	°C	-10
Tdesign	°C	-10
Pdesign	kW	12.00
Heating demand:	kW	12.00
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	11.49
COP	-	2.54
Power consumption	kW	4.53
Measured		
Heating capacity	kW	11.54
COP	-	2.52
Power consumption	kW	4.57
During heating		
Air temperature dry bulb	°C	-10.0
Air temperature wet bulb	°C	-11.1
Inlet temperature	°C	30.0
Outlet temperature	°C	35.0
Outlet temperature (Time averaged)	°C	35.0
Flow	l/h	1994
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	384
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.044



Detailed SCOP test results - high temperature application and average climate conditions - EN 14825:2013

Detailed result for 'EN 14825:2013' Average High (A) A-7/W52		
Tested according to:		EN 14825:2013
Climate zone:		Average
Temperature application:		High
Condition name:		A
Condition temperature:	°C	-7
Part load:	%	88%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	12.00
Heating demand:	kW	10.62
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Transient
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	10.26
COP	-	2.10
Power consumption	kW	4.90
Measured		
Heating capacity	kW	10.29
COP	-	2.09
Power consumption	kW	4.93
During heating		
Air temperature dry bulb	°C	-6.8
Air temperature wet bulb	°C	-7.9
Inlet temperature	°C	44.0
Outlet temperature	°C	51.2
Outlet temperature (Time averaged)	°C	51.2
Flow	l/h	1137
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	235
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.030



Detailed result for 'EN 14825:2013' Average High (B) A2/W42		
Tested according to:		EN 14825:2013
Climate zone:		Average
Temperature application:		High
Condition name:		B
Condition temperature:	°C	2
Part load:	%	54%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	12.00
Heating demand:	kW	6.46
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	6.59
COP	-	3.60
Power consumption	kW	1.83
Measured		
Heating capacity	kW	6.61
COP	-	3.57
Power consumption	kW	1.85
During heating		
Air temperature dry bulb	°C	2.1
Air temperature wet bulb	°C	1.1
Inlet temperature	°C	34.0
Outlet temperature	°C	42.1
Outlet temperature (Time averaged)	°C	42.1
Flow	l/h	708
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	130
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.022



Detailed result for 'EN 14825:2013' Average High (C) A7/W36		
Tested according to:		EN 14825:2013
Climate zone:		Average
Temperature application:		High
Condition name:		C
Condition temperature:	°C	7
Part load:	%	35%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	12.00
Heating demand:	kW	4.15
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	5.08
COP	-	4.50
Power consumption	kW	1.13
Measured		
Heating capacity	kW	5.10
COP	-	4.45
Power consumption	kW	1.15
During heating		
Air temperature dry bulb	°C	7.0
Air temperature wet bulb	°C	5.9
Inlet temperature	°C	29.4
Outlet temperature	°C	37.5
Outlet temperature (Time averaged)	°C	36.0
Flow	l/h	544
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	268
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.018



Detailed result for 'EN 14825:2013' Average High (D) A12/W30		
Tested according to:		EN 14825:2013
Climate zone:		Average
Temperature application:		High
Condition name:		D
Condition temperature:	°C	12
Part load:	%	15%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	12.00
Heating demand:	kW	1.85
CR:	-	0
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	6.05
COP	-	5.62
Power consumption	kW	1.08
Measured		
Heating capacity	kW	6.07
COP	-	5.54
Power consumption	kW	1.10
During heating		
Air temperature dry bulb	°C	12.0
Air temperature wet bulb	°C	11.0
Inlet temperature	°C	27.1
Outlet temperature	°C	36.7
Outlet temperature (Time averaged)	°C	30.0
Flow	l/h	550
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	268
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.019



Detailed result for 'EN 14825:2013' Average High (E and F) A-10/W55		
Tested according to:		EN 14825:2013
Climate zone:		Average
Temperature application:		High
Condition name:		E and F
Condition temperature:	°C	-10
Part load:	%	100%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	12.00
Heating demand:	kW	12.00
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	9.04
COP	-	1.84
Power consumption	kW	4.93
Measured		
Heating capacity	kW	9.07
COP	-	1.83
Power consumption	kW	4.95
During heating		
Air temperature dry bulb	°C	-10.0
Air temperature wet bulb	°C	-10.9
Inlet temperature	°C	47.0
Outlet temperature	°C	54.8
Outlet temperature (Time averaged)	°C	54.8
Flow	l/h	1018
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	243
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.028



Detailed SCOP test results - low temperature application and warmer climate conditions - EN 14825:2013

Detailed result for 'EN 14825:2013' Warmer Low (B, E&F) A2/W35		
Tested according to:		EN 14825:2013
Climate zone:		Warmer
Temperature application:		Low
Condition name:		B, E&F
Condition temperature:	°C	12
Part load:	%	29%
Chosen Tbivalent	°C	2
Tdesign	°C	2
Pdesign	kW	12.00
Heating demand:	kW	3.43
CR:	-	0
Minimum flow reached:	-	No
Measurement type:		Transient
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	12.19
COP	-	3.16
Power consumption	kW	3.85
Measured		
Heating capacity	kW	12.24
COP	-	3.13
Power consumption	kW	3.91
During heating		
Air temperature dry bulb	°C	2.2
Air temperature wet bulb	°C	0.7
Inlet temperature	°C	30.0
Outlet temperature	°C	35.2
Outlet temperature (Time averaged)	°C	31.5
Flow	l/h	2501
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	236
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.051



Detailed result for 'EN 14825:2013' Warmer Low (C) A7/W31		
Tested according to:		EN 14825:2013
Climate zone:		Warmer
Temperature application:		Low
Condition name:		C
Condition temperature:	°C	12
Part load:	%	29%
Chosen Tbivalent	°C	2
Tdesign	°C	2
Pdesign	kW	12.00
Heating demand:	kW	3.43
CR:	-	0
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	7.51
COP	-	5.38
Power consumption	kW	1.40
Measured		
Heating capacity	kW	7.54
COP	-	5.28
Power consumption	kW	1.43
During heating		
Air temperature dry bulb	°C	7.0
Air temperature wet bulb	°C	6.0
Inlet temperature	°C	26.0
Outlet temperature	°C	30.9
Outlet temperature (Time averaged)	°C	28.2
Flow	l/h	1316
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	126
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.033



Detailed result for 'EN 14825:2013' Warmer Low (D) A12/W26		
Tested according to:		EN 14825:2013
Climate zone:		Warmer
Temperature application:		Low
Condition name:		D
Condition temperature:	°C	12
Part load:	%	29%
Chosen Tbivalent	°C	2
Tdesign	°C	2
Pdesign	kW	12.00
Heating demand:	kW	3.43
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	6.17
COP	-	7.10
Power consumption	kW	0.87
Measured		
Heating capacity	kW	6.20
COP	-	6.90
Power consumption	kW	0.90
During heating		
Air temperature dry bulb	°C	12.0
Air temperature wet bulb	°C	11.0
Inlet temperature	°C	23.2
Outlet temperature	°C	28.2
Outlet temperature (Time averaged)	°C	26.0
Flow	l/h	1057
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	173
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.029



Detailed SCOP test results - high temperature application and warmer climate conditions - EN 14825:2013

Detailed result for 'EN 14825:2013' Warmer High (B) A2/W55		
Tested according to:		EN 14825:2013
Climate zone:		Warmer
Temperature application:		High
Condition name:		B
Condition temperature:	°C	2
Part load:	%	100%
Chosen Tbivalent	°C	2
Tdesign	°C	2
Pdesign	kW	12.00
Heating demand:	kW	12.00
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	11.85
COP	-	2.38
Power consumption	kW	4.98
Measured		
Heating capacity	kW	11.88
COP	-	2.37
Power consumption	kW	5.01
During heating		
Air temperature dry bulb	°C	2.1
Air temperature wet bulb	°C	0.9
Inlet temperature	°C	47.0
Outlet temperature	°C	55.1
Outlet temperature (Time averaged)	°C	55.1
Flow	l/h	1282
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	88
Used in calculation: Static differential pressure, liquid pump	mbar	88
Correction of power input, liquid pump	kW	0.030



Detailed result for 'EN 14825:2013' Warmer High (C) A7/W46		
Tested according to:		EN 14825:2013
Climate zone:		Warmer
Temperature application:		High
Condition name:		C
Condition temperature:	°C	12
Part load:	%	29%
Chosen Tbivalent	°C	2
Tdesign	°C	2
Pdesign	kW	12.00
Heating demand:	kW	3.43
CR:	-	0
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	7.67
COP	-	3.75
Power consumption	kW	2.04
Measured		
Heating capacity	kW	7.69
COP	-	3.72
Power consumption	kW	2.07
During heating		
Air temperature dry bulb	°C	6.7
Air temperature wet bulb	°C	6.0
Inlet temperature	°C	38.0
Outlet temperature	°C	46.0
Outlet temperature (Time averaged)	°C	41.6
Flow	l/h	837
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	256
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.025



Detailed result for 'EN 14825:2013' Warmer High (D) A12/W34		
Tested according to:		EN 14825:2013
Climate zone:		Warmer
Temperature application:		High
Condition name:		D
Condition temperature:	°C	12
Part load:	%	29%
Chosen Tbivalent	°C	2
Tdesign	°C	2
Pdesign	kW	12.00
Heating demand:	kW	3.43
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	5.93
COP	-	5.50
Power consumption	kW	1.08
Measured		
Heating capacity	kW	5.95
COP	-	5.42
Power consumption	kW	1.10
During heating		
Air temperature dry bulb	°C	12.0
Air temperature wet bulb	°C	11.0
Inlet temperature	°C	29.4
Outlet temperature	°C	37.5
Outlet temperature (Time averaged)	°C	34.1
Flow	l/h	638
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	151
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.021



Detailed SCOP test results - low temperature application and colder climate conditions - EN 14825:2013

Detailed result for 'EN 14825:2013' Colder Low (A) A-7/W30		
Tested according to:		EN 14825:2013
Climate zone:		Colder
Temperature application:		Low
Condition name:		A
Condition temperature:	°C	-7
Part load:	%	61%
Chosen Tbivalent	°C	N/A
Tdesign	°C	-22
Pdesign	kW	12.00
Heating demand:	kW	7.26
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	7.62
COP	-	3.56
Power consumption	kW	2.14
Measured		
Heating capacity	kW	7.65
COP	-	3.52
Power consumption	kW	2.18
During heating		
Air temperature dry bulb	°C	-7.0
Air temperature wet bulb	°C	-8.1
Inlet temperature	°C	25.0
Outlet temperature	°C	30.0
Outlet temperature (Time averaged)	°C	30.0
Flow	l/h	1320
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	219
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.034



Detailed result for 'EN 14825:2013' Colder Low (C) A7/W25		
Tested according to:		EN 14825:2013
Climate zone:		Colder
Temperature application:		Low
Condition name:		C
Condition temperature:	°C	7
Part load:	%	24%
Chosen Tbivalent	°C	N/A
Tdesign	°C	-22
Pdesign	kW	12.00
Heating demand:	kW	2.84
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	5.26
COP	-	5.45
Power consumption	kW	0.97
Measured		
Heating capacity	kW	5.29
COP	-	5.33
Power consumption	kW	0.99
During heating		
Air temperature dry bulb	°C	7.0
Air temperature wet bulb	°C	6.0
Inlet temperature	°C	22.3
Outlet temperature	°C	27.2
Outlet temperature (Time averaged)	°C	25.0
Flow	l/h	925
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	252
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.026



Detailed result for 'EN 14825:2013' Colder Low (E) A-20/W34.1		
Tested according to:		EN 14825:2013
Climate zone:		Colder
Temperature application:		Low
Condition name:		E
Condition temperature:	°C	-20
Part load:	%	95%
Chosen Tbivalent	°C	N/A
Tdesign	°C	-22
Pdesign	kW	12.00
Heating demand:	kW	11.37
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	8.69
COP	-	2.06
Power consumption	kW	4.21
Measured		
Heating capacity	kW	8.73
COP	-	2.05
Power consumption	kW	4.25
During heating		
Air temperature dry bulb	°C	-20.0
Air temperature wet bulb	°C	-
Inlet temperature	°C	29.1
Outlet temperature	°C	34.2
Outlet temperature (Time averaged)	°C	34.2
Flow	l/h	1500
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	201
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.037



Detailed result for 'EN 14825:2013' Colder Low (G) A-15/W32		
Tested according to:		EN 14825:2013
Climate zone:		Colder
Temperature application:		Low
Condition name:		G
Condition temperature:	°C	-7
Part load:	%	61%
Chosen Tbivalent	°C	N/A
Tdesign	°C	-22
Pdesign	kW	12.00
Heating demand:	kW	7.26
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	10.18
COP	-	2.42
Power consumption	kW	4.20
Measured		
Heating capacity	kW	10.22
COP	-	2.41
Power consumption	kW	4.24
During heating		
Air temperature dry bulb	°C	-15.0
Air temperature wet bulb	°C	-
Inlet temperature	°C	27.0
Outlet temperature	°C	32.1
Outlet temperature (Time averaged)	°C	30.6
Flow	l/h	1750
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	171
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.041



Detailed SCOP test results - high temperature application and colder climate conditions - EN 14825:2013

Detailed result for 'EN 14825:2013' Colder High (E) A-17/W55		
Tested according to:		EN 14825:2013
Climate zone:		Colder
Temperature application:		High
Condition name:		E
Condition temperature:	°C	-17
Part load:	%	87%
Chosen Tbivalent	°C	N/A
Tdesign	°C	-22
Pdesign	kW	12.00
Heating demand:	kW	10.42
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	7.41
COP	-	1.59
Power consumption	kW	4.66
Measured		
Heating capacity	kW	7.43
COP	-	1.59
Power consumption	kW	4.68
During heating		
Air temperature dry bulb	°C	-17.0
Air temperature wet bulb	°C	-
Inlet temperature	°C	47.1
Outlet temperature	°C	55.2
Outlet temperature (Time averaged)	°C	55.2
Flow	l/h	796
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	142
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.024



Detailed result for 'EN 14825:2013' Colder High (G) A-15/W49		
Tested according to:		EN 14825:2013
Climate zone:		Colder
Temperature application:		High
Condition name:		G
Condition temperature:	°C	-7
Part load:	%	61%
Chosen Tbivalent	°C	N/A
Tdesign	°C	-22
Pdesign	kW	12.00
Heating demand:	kW	7.26
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	8.31
COP	-	1.88
Power consumption	kW	4.42
Measured		
Heating capacity	kW	8.33
COP	-	1.87
Power consumption	kW	4.44
During heating		
Air temperature dry bulb	°C	-15.0
Air temperature wet bulb	°C	-
Inlet temperature	°C	41.0
Outlet temperature	°C	49.0
Outlet temperature (Time averaged)	°C	48.0
Flow	l/h	902
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	136
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.026



Detailed SEER test results for, fan coil cooling- EN 14825:2013

Detailed result for 'EN 14825:2013' Cooling fan (A) A35/W7		
Tested according to:		EN 14825:2013
Climate zone:		-
Temperature application:		Cooling fan
Condition name:		A
Condition temperature:	°C	35
Part load:	%	100%
Chosen Tbivalent	°C	-
Tdesign	°C	35
Pdesign	kW	6.45
Cooling demand:	kW	6.45
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Cooling capacity	kW	6.42
EER	-	2.32
Power consumption	kW	2.77
Measured		
Cooling capacity	kW	6.39
EER	-	2.28
Power consumption	kW	2.80
During cooling		
Air temperature dry bulb	°C	34.9
Air temperature wet bulb	°C	24.1
Inlet temperature	°C	11.9
Outlet temperature	°C	7.2
Outlet temperature (Time averaged)	°C	7.2
Flow	l/h	1166
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	639
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.031



Detailed result for 'EN 14825:2013' Cooling fan (B) A30/W7		
Tested according to:		EN 14825:2013
Climate zone:		-
Temperature application:		Cooling fan
Condition name:		B
Condition temperature:	°C	30
Part load:	%	74%
Chosen Tbivalent	°C	-
Tdesign	°C	35
Pdesign	kW	6.45
Cooling demand:	kW	4.77
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Cooling capacity	kW	4.96
EER	-	2.97
Power consumption	kW	1.67
Measured		
Cooling capacity	kW	4.93
EER	-	2.91
Power consumption	kW	1.69
During cooling		
Air temperature dry bulb	°C	30.0
Air temperature wet bulb	°C	22.0
Inlet temperature	°C	12.0
Outlet temperature	°C	6.7
Outlet temperature (Time averaged)	°C	6.7
Flow	l/h	807
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	762
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.024



Detailed result for 'EN 14825:2013' Cooling fan (C) A25/W7		
Tested according to:		EN 14825:2013
Climate zone:		-
Temperature application:		Cooling fan
Condition name:		C
Condition temperature:	°C	25
Part load:	%	47%
Chosen Tbivalent	°C	-
Tdesign	°C	35
Pdesign	kW	6.45
Cooling demand:	kW	3.03
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Cooling capacity	kW	2.98
EER	-	3.39
Power consumption	kW	0.88
Measured		
Cooling capacity	kW	2.97
EER	-	3.31
Power consumption	kW	0.90
During cooling		
Air temperature dry bulb	°C	25.0
Air temperature wet bulb	°C	19.0
Inlet temperature	°C	12.0
Outlet temperature	°C	7.0
Outlet temperature (Time averaged)	°C	7.0
Flow	l/h	508
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	768
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.018



Detailed result for 'EN 14825:2013' Cooling fan (D) A20/W7		
Tested according to:		EN 14825:2013
Climate zone:		-
Temperature application:		Cooling fan
Condition name:		D
Condition temperature:	°C	20
Part load:	%	21%
Chosen Tbivalent	°C	-
Tdesign	°C	35
Pdesign	kW	6.45
Cooling demand:	kW	1.35
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Cooling capacity	kW	2.48
EER	-	3.11
Power consumption	kW	0.80
Measured		
Cooling capacity	kW	2.47
EER	-	3.03
Power consumption	kW	0.81
During cooling		
Air temperature dry bulb	°C	20.0
Air temperature wet bulb	°C	15.5
Inlet temperature	°C	9.6
Outlet temperature	°C	5.0
Outlet temperature (Time averaged)	°C	7.1
Flow	l/h	460
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	769
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.016



Detailed SEER test results for, cooling floor cooling-EN 14825:2013

Detailed result for 'EN 14825:2013' Cooling floor (A) A35/W18		
Tested according to:		EN 14825:2013
Climate zone:		-
Temperature application:		Cooling floor
Condition name:		A
Condition temperature:	°C	35
Part load:	%	100%
Chosen Tbivalent	°C	-
Tdesign	°C	35
Pdesign	kW	10.00
Cooling demand:	kW	10.00
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Cooling capacity	kW	10.11
EER	-	2.84
Power consumption	kW	3.56
Measured		
Cooling capacity	kW	10.09
EER	-	2.81
Power consumption	kW	3.59
During cooling		
Air temperature dry bulb	°C	35.0
Air temperature wet bulb	°C	24.1
Inlet temperature	°C	23.0
Outlet temperature	°C	18.0
Outlet temperature (Time averaged)	°C	18.0
Flow	l/h	1727
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	55
Used in calculation: Static differential pressure, liquid pump	mbar	55
Correction of power input, liquid pump	kW	0.026



Detailed result for 'EN 14825:2013' Cooling floor (B) A30/W18		
Tested according to:		EN 14825:2013
Climate zone:		-
Temperature application:		Cooling floor
Condition name:		B
Condition temperature:	°C	30
Part load:	%	74%
Chosen Tbivalent	°C	-
Tdesign	°C	35
Pdesign	kW	10.00
Cooling demand:	kW	7.40
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Cooling capacity	kW	7.45
EER	-	4.96
Power consumption	kW	1.50
Measured		
Cooling capacity	kW	7.41
EER	-	4.84
Power consumption	kW	1.53
During cooling		
Air temperature dry bulb	°C	30.0
Air temperature wet bulb	°C	21.0
Inlet temperature	°C	23.0
Outlet temperature	°C	18.0
Outlet temperature (Time averaged)	°C	18.0
Flow	l/h	1276
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	105
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.033



Detailed result for 'EN 14825:2013' Cooling floor (C) A25/W18		
Tested according to:		EN 14825:2013
Climate zone:		-
Temperature application:		Cooling floor
Condition name:		C
Condition temperature:	°C	25
Part load:	%	47%
Chosen Tbivalent	°C	-
Tdesign	°C	35
Pdesign	kW	10.00
Cooling demand:	kW	4.70
CR:	-	1
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Cooling capacity	kW	5.06
EER	-	5.73
Power consumption	kW	0.88
Measured		
Cooling capacity	kW	5.03
EER	-	5.55
Power consumption	kW	0.91
During cooling		
Air temperature dry bulb	°C	25.0
Air temperature wet bulb	°C	18.9
Inlet temperature	°C	23.0
Outlet temperature	°C	18.0
Outlet temperature (Time averaged)	°C	18.0
Flow	l/h	859
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	755
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.025



Detailed result for 'EN 14825:2013' Cooling floor (D) A20/W18		
Tested according to:		EN 14825:2013
Climate zone:		-
Temperature application:		Cooling floor
Condition name:		D
Condition temperature:	°C	20
Part load:	%	21%
Chosen Tbivalent	°C	-
Tdesign	°C	35
Pdesign	kW	10.00
Cooling demand:	kW	2.10
CR:	-	0
Minimum flow reached:	-	No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Cooling capacity	kW	4.33
EER	-	6.64
Power consumption	kW	0.65
Measured		
Cooling capacity	kW	4.31
EER	-	6.39
Power consumption	kW	0.68
During cooling		
Air temperature dry bulb	°C	20.0
Air temperature wet bulb	°C	15.2
Inlet temperature	°C	20.5
Outlet temperature	°C	15.5
Outlet temperature (Time averaged)	°C	18.0
Flow	l/h	739
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	145
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.023



Detailed test results for rating condition tests at low temperature application for space heating according to EN 14511:2011

Detailed result for 'EN 14511:2011' A7/W35		
Tested according to:		EN 14511:2011
Minimum flow reached:		No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	14.58
COP	-	4.28
Power consumption	kW	3.41
Measured		
Heating capacity	kW	14.63
COP	-	4.23
Power consumption	kW	3.46
During heating		
Air temperature dry bulb	°C	7.0
Air temperature wet bulb	°C	5.8
Inlet temperature	°C	30.0
Outlet temperature	°C	35.0
Flow	l/h	2521
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	239
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.052



Detailed result for 'EN 14511:2011' A2/W35		
Tested according to:	EN 14511:2011	
Minimum flow reached:	No	
Measurement type:	Transient	
Data treatment according to EN14511-3:2011 Annex C		
Integrated circulation pump:	Yes	
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	12.19
COP	-	3.16
Power consumption	kW	3.85
Measured		
Heating capacity	kW	12.24
COP	-	3.13
Power consumption	kW	3.91
During heating		
Air temperature dry bulb	°C	2.2
Air temperature wet bulb	°C	0.7
Inlet temperature	°C	30.0
Outlet temperature	°C	35.2
Flow	l/h	2501
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	236
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.051



Detailed result for 'EN 14511:2011' A-7/W35		
Tested according to:	EN 14511:2011	
Minimum flow reached:	No	
Measurement type:	Transient	
Data treatment according to EN14511-3:2011 Annex C		
Integrated circulation pump:	Yes	
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	11.30
COP	-	2.62
Power consumption	kW	4.31
Measured		
Heating capacity	kW	11.35
COP	-	2.60
Power consumption	kW	4.36
During heating		
Air temperature dry bulb	°C	-7.0
Air temperature wet bulb	°C	-7.9
Inlet temperature	°C	30.0
Outlet temperature	°C	34.9
Flow	l/h	2191
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	327
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.047



Detailed test results for additional performance tests for space heating according to EN 14511:2011

Detailed result for 'EN 14511:2011' A7/W60		
Tested according to:	EN 14511:2011	
Minimum flow reached:	No	
Measurement type:	Steady state	
Data treatment according to EN14511-3:2011 Annex C		
Integrated circulation pump:	Yes	
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	8.85
COP	-	2.44
Power consumption	kW	3.63
Measured		
Heating capacity	kW	8.88
COP	-	2.43
Power consumption	kW	3.66
During heating		
Air temperature dry bulb	°C	7.0
Air temperature wet bulb	°C	6.0
Inlet temperature	°C	52.1
Outlet temperature	°C	60.0
Flow	l/h	971
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	227
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.027



Detailed result for 'EN 14511:2011' A-7/W60		
Tested according to:		EN 14511:2011
Minimum flow reached:		No
Measurement type:		Steady state
<i>Data treatment according to EN14511-3:2011 Annex C</i>		
Integrated circulation pump:		Yes
Corrected for power input of liquid pumps (Final result)		
Heating capacity	kW	9.16
COP	-	1.71
Power consumption	kW	5.36
Measured		
Heating capacity	kW	9.18
COP	-	1.70
Power consumption	kW	5.39
During heating		
Air temperature dry bulb	°C	-7.0
Air temperature wet bulb	°C	-7.9
Inlet temperature	°C	51.9
Outlet temperature	°C	59.8
Flow	l/h	1022
Circulation pump		
Measured: Static differential pressure, liquid pump	mbar	127
Used in calculation: Static differential pressure, liquid pump	mbar	100
Correction of power input, liquid pump	kW	0.028



Detailed standard rating condition test results for fan coil space cooling - EN 14511:2011

Detailed result for 'EN14511:2011' A35/W7		
Tested according to:		EN14511:2011
Minimum flow reached:		Yes
Measurement type:		Steady State
Integrated circulation pump:		Yes
Included corrections (Final result)		
Heating capacity	kW	5.77
COP	-	2.55
Power consumption	kW	2.26
Measured		
Heating capacity	kW	5.79
COP	-	2.53
Power consumption	kW	2.29
During heating		
Air temperature dry bulb	°C	35.0
Air temperature wet bulb	°C	22.9
Inlet temperature	°C	10.9
Outlet temperature	°C	6.8
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	10944
Calculated Hydraulic power	W	4
Calculated global efficiency	η	0.16
Calculated Capacity correction	W	19
Calculated Power correction	W	23
Water Flow	m ³ /s	0.000332




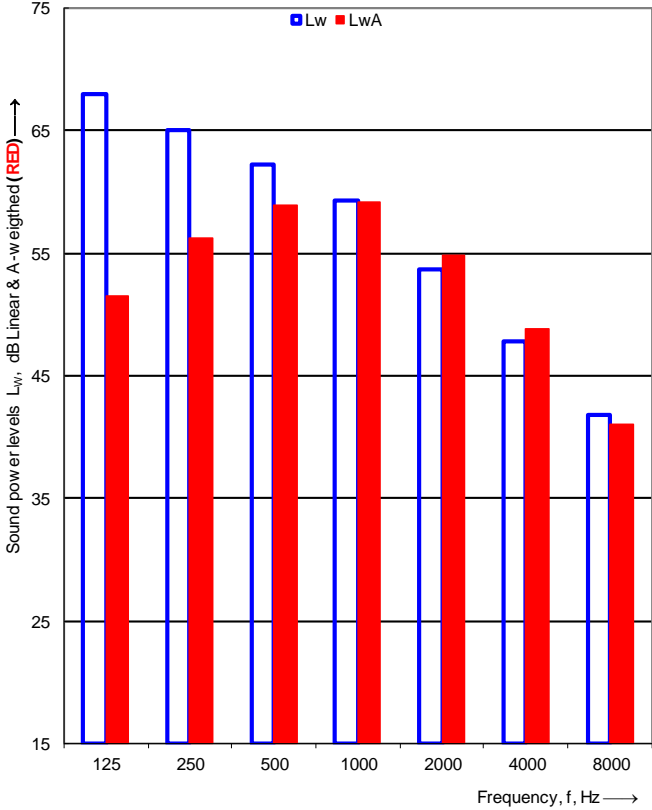


Detailed result for 'EN14511:2011' A35/W18		
Tested according to:		EN14511:2011
Minimum flow reached:		No
Measurement type:		Steady State
Integrated circulation pump:		Yes
Included corrections (Final result)		
Heating capacity	kW	7.99
COP	-	3.47
Power consumption	kW	2.30
Measured		
Heating capacity	kW	8.01
COP	-	3.44
Power consumption	kW	2.33
During heating		
Air temperature dry bulb	°C	35.0
Air temperature wet bulb	°C	23.3
Inlet temperature	°C	23.0
Outlet temperature	°C	18.0
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	9461
Calculated Hydraulic power	W	4
Calculated global efficiency	η	0.16
Calculated Capacity correction	W	19
Calculated Power correction	W	23
Water Flow	m ³ /s	0.000383






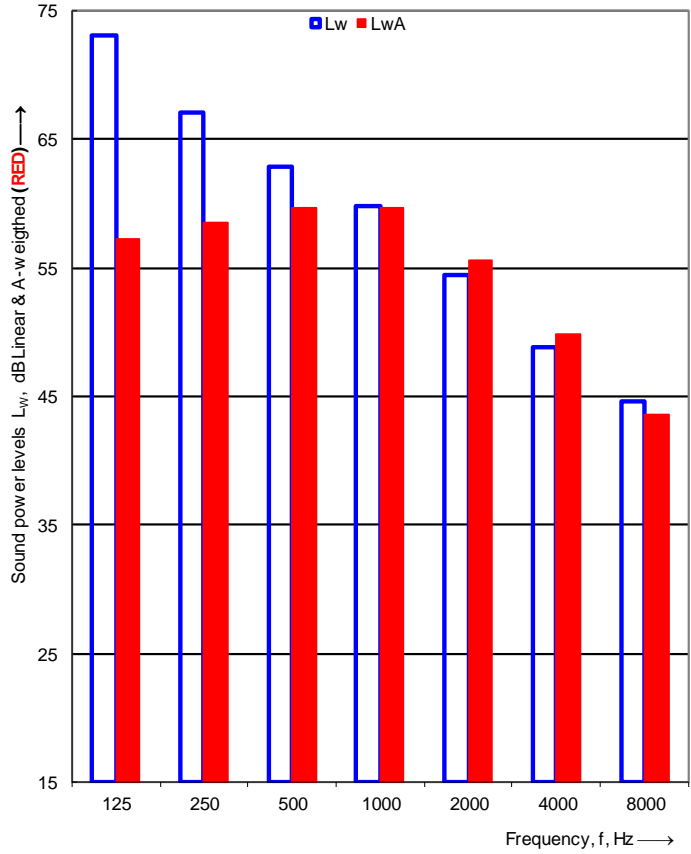
Detailed test results of sound power measurements – EN 1202-1:2017

Test N#1

 		Sound power levels according to ISO 3743-1:2010		 TEKNOLOGISK INSTITUT																																																																			
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms																																																																							
Client:		Bosch Termotecnologia SA		Date of test: 08-09-2021																																																																			
Object:		Type: Air to water heat pump Model: Compress 3400i AWS - CS3400iAWS 14- T																																																																					
Mounting conditions:		The out door unit is standing free on a water drop tray placed on two pieces of heavy concrete tiles (90x90x10cm) laying on the floor. Between the metal supporting frame and the water drop tray a vibration damping mat of 2.5 cm thick is placed. The noise radiated by the out door unit has been measured in Test room 1.																																																																					
Operating conditions:		A7/W55, Compressor speed: 23[Hz], Fan speed: 690[rpm], Heating capacity: 4.73[kW], Power_input: 1.83[kW], Water flow rate: 520[l/h], dP_water : 133 [mBar]																																																																					
Static pressure:		1020 kPa		<u>Reference box:</u>																																																																			
Air temperature:		7.0 °C		L1: 0.9 m																																																																			
Relative air humidity:		85.0 %		L2: 0.3 m																																																																			
Test room volume:		102.8 m³		Room: Room 1																																																																			
Area, S, of test room:		138.9 m²		L3: 1.2 m																																																																			
				Volume: 0.3 m³																																																																			
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Sound power level L_w(A): 64.1 dB [re 1pW]																																																																							
Name of test institute:		DTI																																																																					
No. of test report:		300-KLAB-21-027																																																																					
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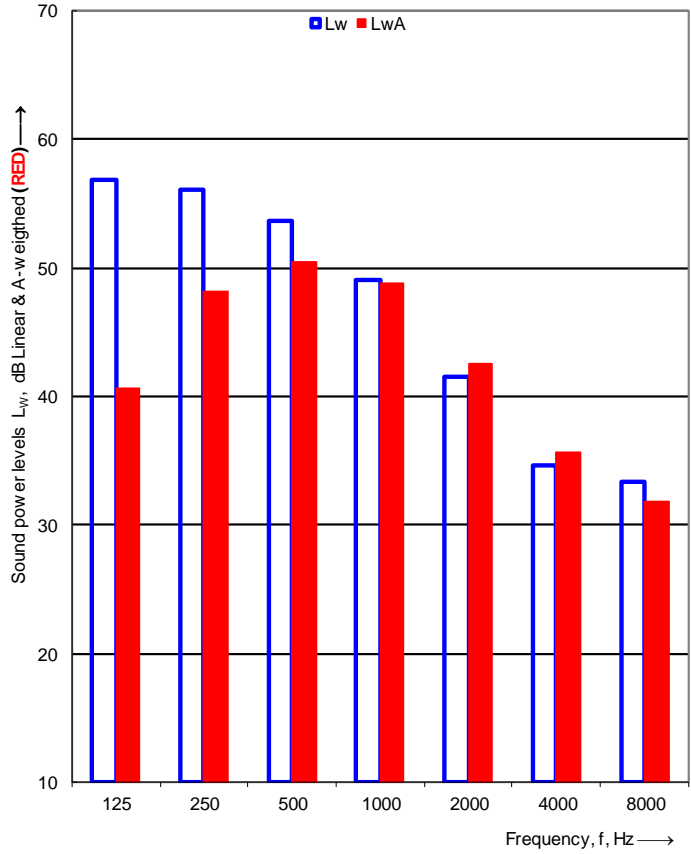


Test N#2

 		Sound power levels according to ISO 3743-1:2010																																																																					
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms																																																																							
Client:	Bosch Termotecnologia SA			Date of test: 08-09-2021																																																																			
Object:	Type: Air to water heat pump Model: Compress 3400i AWS - CS3400iAWS 14- T																																																																						
Mounting conditions:	The out door unit is standing free on a water drop tray placed on two pieces of heavy concrete tiles (90x90x10cm) laying on the floor. Between the metal supporting frame and the water drop tray a vibration damping mat of 2.5 cm thick is placed. The noise radiated by the out door unit has been measured in Test room 1.																																																																						
Operating conditions:	A7/W35, Compressor speed: 70[Hz], Fan speed: 690[rpm], Heating capacity: 17.0[kW], Power_input: 4.16[kW], Water flow rate: 2760[l/h], dP_water : 171 [mBar]																																																																						
Static pressure:	1020 kPa			<u>Reference box:</u>																																																																			
Air temperature:	7.0 °C			L1:	0.9 m																																																																		
Relative air humidity:	85.0 %			L2:	0.3 m																																																																		
Test room volume:	102.8 m³	Room:	Room 1	L3:	1.2 m																																																																		
Area, S, of test room:	138.9 m²			Volume:	0.3 m³																																																																		
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Sound power level L_w(A): 65.5 dB [re 1pW]																																																																							
Name of test institute:	DTI																																																																						
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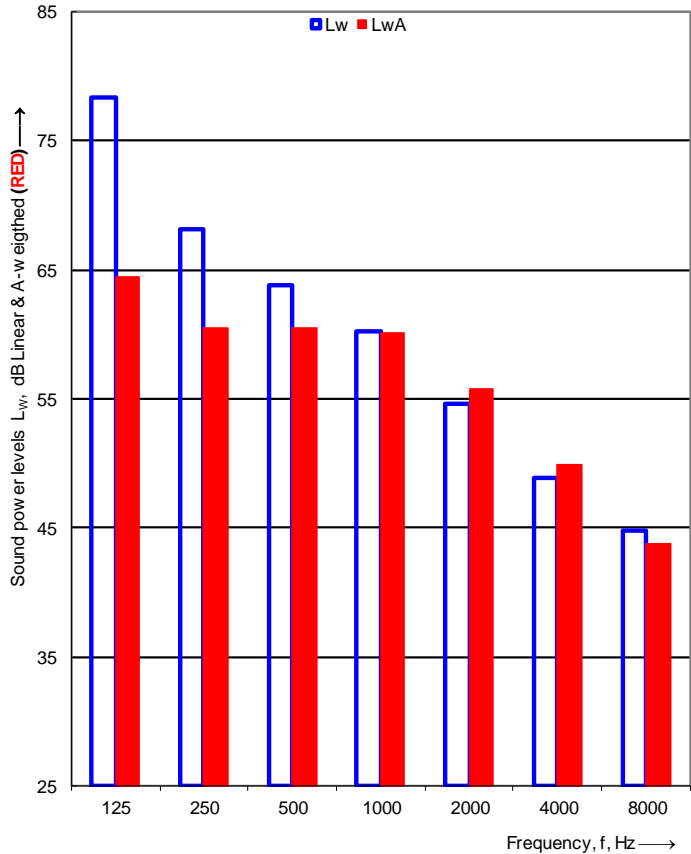


Test N#3

 		Sound power levels according to ISO 3743-1:2010																																																																				
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms																																																																						
Client:	Bosch Termotecnologia SA			Date of test: 09-09-2021																																																																		
Object:	Type: Air to water heat pump Model: Compress 3400i AWS - CS3400iAWS 14- T																																																																					
Mounting conditions:	The out door unit is standing free on a water drop tray placed on two pieces of heavy concrete tiles (90x90x10cm) laying on the floor. Between the metal supporting frame and the water drop tray a vibration damping mat of 2.5 cm thick is placed. The noise radiated by the out door unit has been measured in Test room 1.																																																																					
Operating conditions:	A7/W55, Compressor speed: 31[Hz], Fan speed: 400[rpm], Heating capacity: 6.45[kW], Power_input: 2.26[kW], Water flow rate: 709[l/h], dP_water : 256 [mBar]																																																																					
Static pressure:	1020 kPa			<u>Reference box:</u>																																																																		
Air temperature:	7.0 °C			L1:	0.9 m																																																																	
Relative air humidity:	85.0 %			L2:	0.3 m																																																																	
Test room volume:	102.8 m³	Room:	Room 1	L3:	1.2 m																																																																	
Area, S, of test room:	138.9 m²			Volume:	0.3 m³																																																																	
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Sound power level L_w(A): 54.6 dB [re 1pW]																																																																						
Name of test institute:	DTI																																																																					
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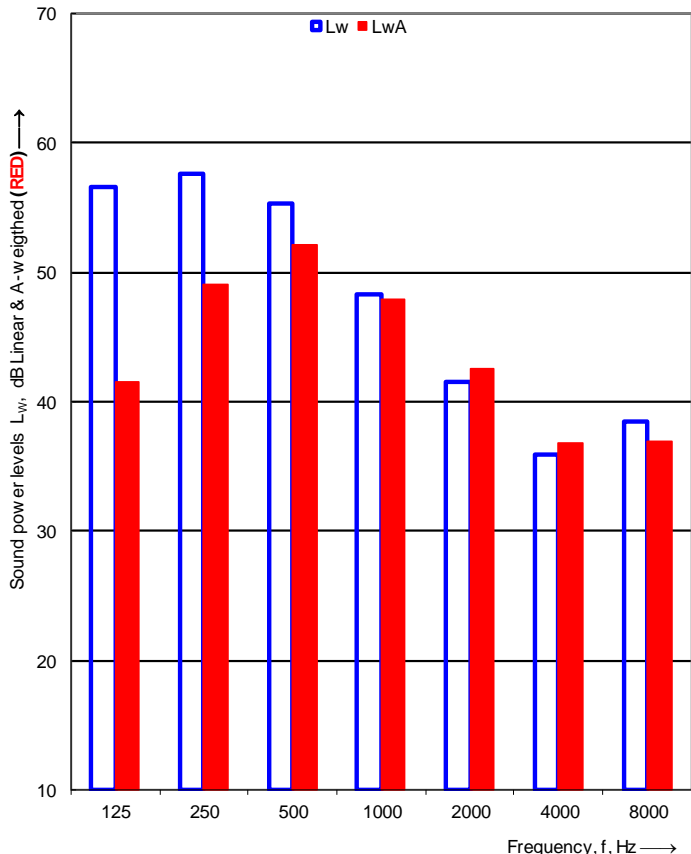


Test N#4

 		Sound power levels according to ISO 3743-1:2010																																																																					
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms																																																																							
Client:	Bosch Termotecnologia SA			Date of test: 08-09-2021																																																																			
Object:	Type: Air to water heat pump Model: Compress 3400i AWS - CS3400iAWS 14- T																																																																						
Mounting conditions:	The out door unit is standing free on a water drop tray placed on two pieces of heavy concrete tiles (90x90x10cm) laying on the floor. Between the metal supporting frame and the water drop tray a vibration damping mat of 2.5 cm thick is placed. The noise radiated by the out door unit has been measured in Test room 1.																																																																						
Operating conditions:	A7/W35, Compressor speed: 75[Hz], Fan speed: 690[rpm], Heating capacity: 17.7[kW], Power input: 4.51[kW], Water flow rate: 2825[l/h], dP_water : 155 [mBar]																																																																						
Static pressure:	1020 kPa	Reference box:																																																																					
Air temperature:	7.0 °C	L1: 0.9 m																																																																					
Relative air humidity:	85.0 %	L2: 0.3 m																																																																					
Test room volume:	102.8 m³	Room:	Room 1	L3: 1.2 m																																																																			
Area, S, of test room:	138.9 m²	Volume: 0.3 m³																																																																					
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Sound power level L_w(A): 68.1 dB [re 1pW]																																																																							
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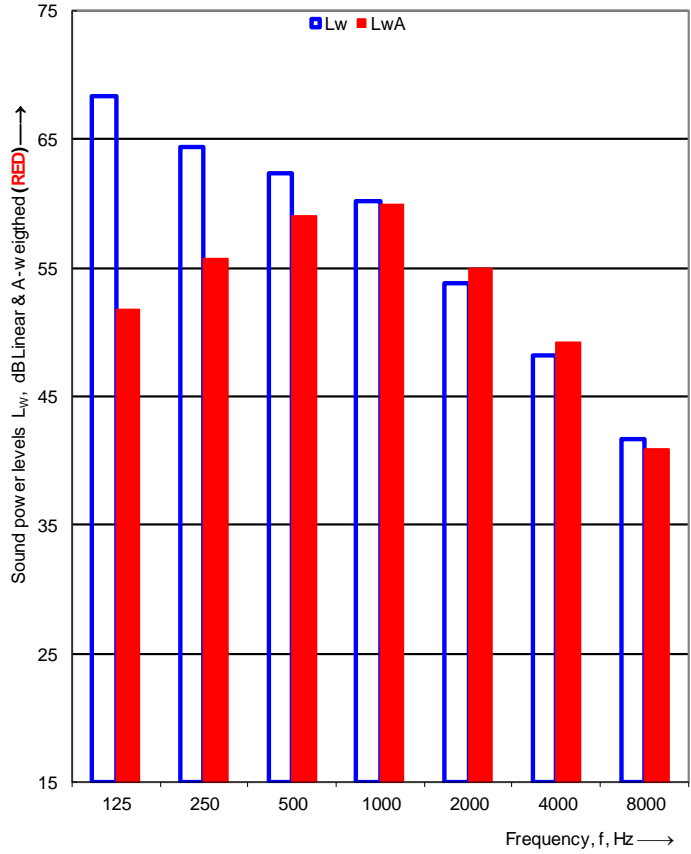


Test N#5

 		Sound power levels according to ISO 3743-1:2010		 TEKNOLOGISK INSTITUT																																																																		
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms																																																																						
Client:	Bosch Termotecnologia SA			Date of test: 09-09-2021																																																																		
Object:	Type: Air to water heat pump Model: Compress 3400iAWS - CS3400iAWS 14- T																																																																					
Mounting conditions:	The out door unit is standing free on a water drop tray placed on two pieces of heavy concrete tiles (90x90x10cm) laying on the floor. Between the metal supporting frame and the water drop tray a vibration damping mat of 2.5 cm thick is placed. The noise radiated by the out door unit has been measured in Test room 1.																																																																					
Operating conditions:	A7/W55, Compressor speed: 37[Hz], Fan speed: 400[rpm], Heating capacity: 7.8[kW], Power input: 2.73[kW], Water flow rate: 860[l/h], dP_water : 247 [mBar]																																																																					
Static pressure:	1020 kPa			Reference box:																																																																		
Air temperature:	7.0 °C			L1:	0.9 m																																																																	
Relative air humidity:	85.0 %			L2:	0.3 m																																																																	
Test room volume:	102.8 m³	Room:	Room 1	L3:	1.2 m																																																																	
Area, S, of test room:	138.9 m²			Volume:	0.3 m³																																																																	
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Sound power level L_w(A): 55.4 dB [re 1pW]																																																																						
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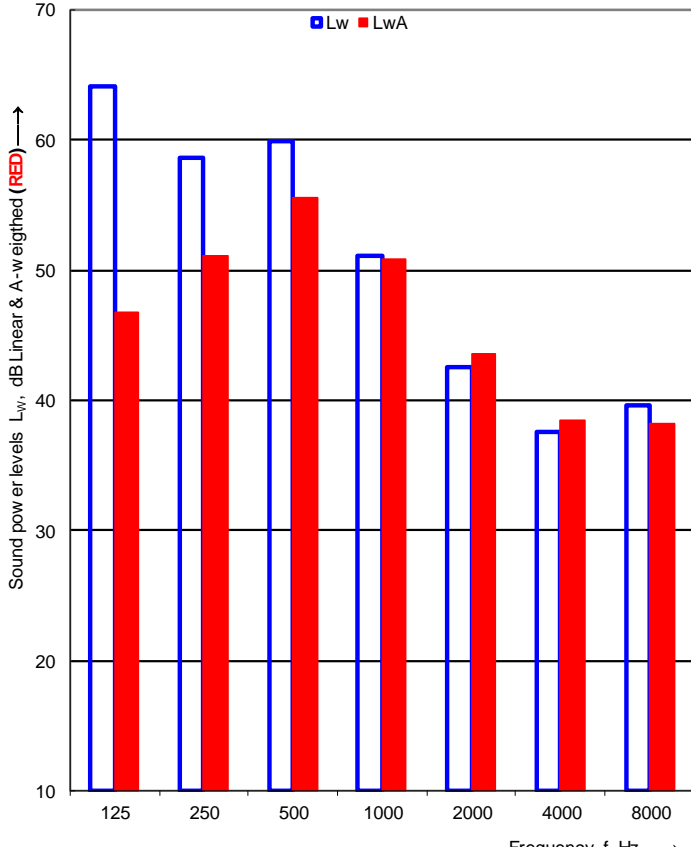


Test N#6

 		Sound power levels according to ISO 3743-1:2010																																																																					
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms																																																																							
Client:	Bosch Termotecnologia SA			Date of test: 08-09-2021																																																																			
Object:	Type: Air to water heat pump Model: Compress 3400i AWS - CS3400iAWS 14- T																																																																						
Mounting conditions:	The out door unit is standing free on a water drop tray placed on two pieces of heavy concrete tiles (90x90x10cm) laying on the floor. Between the metal supporting frame and the water drop tray a vibration damping mat of 2.5 cm thick is placed. The noise radiated by the out door unit has been measured in Test room 1.																																																																						
Operating conditions:	A7/W55, Compressor speed: 24[Hz], Fan speed: 690[rpm], Heating capacity: 5.05[kW], Power_input: 1.9[kW], Water flow rate: 550[l/h], dP_water : 132 [mBar]																																																																						
Static pressure:	1020 kPa			<u>Reference box:</u>																																																																			
Air temperature:	7.0 °C			L1:	0.9 m																																																																		
Relative air humidity:	85.0 %			L2:	0.3 m																																																																		
Test room volume:	102.8 m³	Room:	Room 1	L3:	1.2 m																																																																		
Area, S, of test room:	138.9 m²			Volume:	0.3 m³																																																																		
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Sound power level L_w(A): 64.4 dB [re 1pW]																																																																							
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Test N#7

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Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms																																																																						
Client:	Bosch Termotecnologia SA			Date of test: 09-09-2021																																																																		
Object:	Type: Air to water heat pump Model: Compress 3400iAWS - CS3400iAWS 14- T																																																																					
Mounting conditions:	The out door unit is standing free on a water drop tray placed on two pieces of heavy concrete tiles (90x90x10cm) laying on the floor. Between the metal supporting frame and the water drop tray a vibration damping mat of 2.5 cm thick is placed. The noise radiated by the out door unit has been measured in Test room 1.																																																																					
Operating conditions:	A7/W55, Compressor speed: 45[Hz], Fan speed: 400[rpm], Heating capacity: 9.45[kW], Power input: 3.42[kW], Water flow rate: 1050[l/h], dP_water : 235 [mBar]																																																																					
Static pressure:	1020 kPa			<u>Reference box:</u>																																																																		
Air temperature:	7.0 °C			L1:	0.9 m																																																																	
Relative air humidity:	85.0 %			L2:	0.3 m																																																																	
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Appendix 1: Test Procedure

The measurements of the emitted sound power level from the heat pump are carried out according to the following:

- DS/EN 14511
- EN 12102
- ISO/EN 3743/1

The basic acoustic measurement standard ISO/EN 3743-1 is a comparison method using a calibrated reference sound source. Two series of sound pressure measurements are made under exactly the same acoustic conditions, e.g., the same microphone positions, temperature and air humidity. The calibrated sound power levels are known for the reference sound source at each frequency band, and they are used in the estimation of the acoustical correction factor for the calculation of the sound power emitted from the tested heat pump. The background noise levels are measured and used for relevant corrections.

The final total A-weighted sound power level is based on measurements and calculations in 1/3-octave levels, which then are summed into 1/1-octave levels. The uncertainty is estimated on the weighted standard deviations in 1/1-octave levels.

The actual microphone positions and correction values are saved in data files linked to the complete project documentation according to the DANAK-accreditation.

The complete measurement system is documented and regularly calibrated according to DANAK.

The detailed description of the measurement method is given in Danish in the quality database system "QA Web" at Danish Technological Institute, which is accessible by DANAK.