



TEST REPORT

Report no.:

300-KLAB-16-020 Sound power

Product:

Type: Air to water heat pump
Panasonic WH-SQC09H3E8/WH-UQ09HE8

Customer:

Panasonic DE GmbH

Date:

May 2017

Consultants:

Kamalathasan Arumugam & Birger Bech Jessen



DANISH
TECHNOLOGICAL
INSTITUTE

TEST REPORT

DK-8000 Aarhus C
Tel.: 72 20 20 00
Fax: 72 20 10 19

Date: 2017.05.24
Report no.: 300-KLAB-16-020
File no.: 702529

Page: 1 of 12
Init.: KAMA/JGW
Enclosures: 1

info@teknologisk.dk
www.teknologisk.dk

Customer: Contact person: Thomas Gross
Company: Panasonic DE GmbH
Address: Hagenauer Strasse 43
City: 65203 Wiesbaden
Tel.: +49 1724 141441

Component: Brand: Panasonic
Type: Air to water heat pump
Model: Indoor WH-SQC09H3E8 & outdoor WH-UQ09HE8
Series no.: 55174 & 56185
Production year: Indoor n.a., outdoor n.a.

Dates Component tested: May 2017

Procedure: Test procedure according to EN 12102:2013 and the method ISO 3743-1:2010 and EN 14511:2013 part 1, 2, 3, and 4.

Remarks: The unit was delivered by the customer. Installation and setting of the unit's control system were done according to the manufacturer's instructions.

Conditions: Accredited testing was carried out in compliance with the current guidelines laid down by DANAK (Danish Laboratory Accreditation Scheme), please see www.danak.dk, and in compliance with Danish Technological Institute's General Terms and Conditions regarding Commissioned Work Accepted by Danish Technological Institute, March 2015.

The test results apply to the tested products only.

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Division/Centre: Danish Technological Institute
Energy and Climate
Heat Pump Laboratory, Aarhus

Date: 2017.05.24

Signature:

Co-reader:

Kamalathasan Arumugam
B.Sc. Engineer

Birger Bech Jessen
Senior Consultant



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Page 2 of 12
300-KLAB-16-020

Objective

The objective of this report is to document the sound power level of the outdoor unit at the test conditions and heat pump settings stated in the table below.

The measurement of the sound power level is performed according to the standard EN 12102, using the Class A method. ISO 3743-1 is the basic method of carrying out sound power measurements. The method is briefly described in appendix 1. For a more detailed description, please view the accreditation papers DANAK-300 (in Danish only). The sound power level is measured for the outdoor unit only and not for the indoor unit as neither the compressor nor the fan is a part of this.



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Page 3 of 12
300-KLAB-16-020

Test conditions and heat pump settings for sound power measurements

N°	Test condition	Heat pump setting				
		Compressor speed [Hz]	Fan speed 1 [rpm]	Fan speed 2 [rpm]	Heating capacity [kW]	Water flow rate [l/h]
1 ¹	A7/W35	35-36	490	530	9.1	1590
2 ²	A7/W35	25-26	340	380	5.49	980
3 ³	A7/W35	19-20	360	400	4.25	770
4 ¹	A7/W55	40-41	500	540	9.01	1163
5 ²	A7/W55	29-30	350-450	390-490	4.5	700
6 ³	A7/W55	19-20	320-330	360-370	2.5	700

¹) Free mode, ²) Quiet mode level 3, ³) Test mode 4



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Page 4 of 12
300-KLAB-16-020

Test results of the sound power test

Test results of the sound power measurements N°	Sound power level LW(A) [dB re 1pW]	Uncertainty [dB] (weighted value)
1	57	0.1
2	50	0.1
3	51	0.2
4	58	0.1
5	55	0.2
6	52	0.1

The uncertainty value is a weighted value using the level and frequency dependant influence for each 1/1-octave level on the final A-weighted sound power level.

The A-weighted total sound power level is determined for the measured frequency range from 100 Hz to 10 kHz.



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Page 5 of 12
300-KLAB-16-020

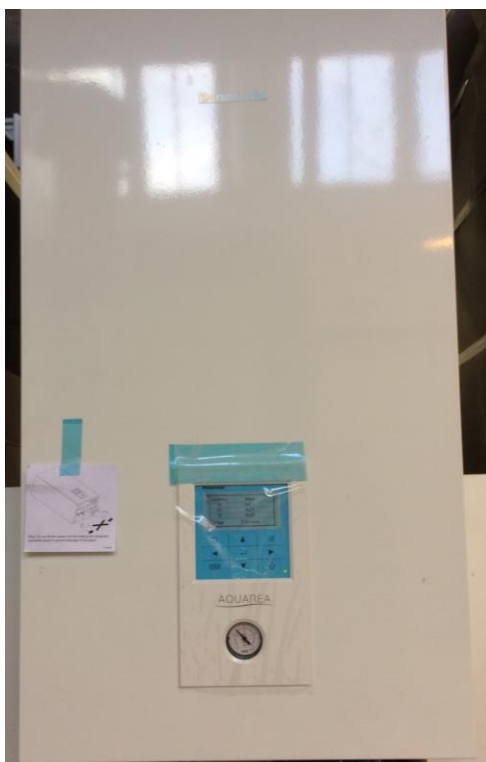
Outdoor unit



Rating plate - outdoor unit

Panasonic	
AIR-TO-WATER HEATPUMP	
OUTDOOR UNIT	WH-UQ09HE8
Model No.	400 V
RATED VOLTAGE	3N~
PHASE	50Hz
FREQUENCY	6.85kW/10.4A
MAXIMUM INPUT	REFRIGERANT R410A 2.85kg
COOLING (A35W7)	HEATING (A7W35)
1.00kW	9.03kW
CAPACITY	3.4A 2.8A 3.8A
CURRENT	POWER INPUT 2.21kW 1.96kW 2.51kW
POWER INPUT	EER/COP 3.17 4.84 3.59
EER/COP	(EN 14511)
MWP	H.P. 4.15MPa L.P. 2.00MPa
SERIAL NO.	56185
PRODUCTION DATE	Panasonic Appliances
	Air-Conditioning Malaysia Sdn. Bhd.
	Shah Alam Malaysia
	Authorized representative in EU
	Panasonic Testing Centre
	Panasonic Marketing Europe GmbH
	Wiesbergweg 15, 22525 Hamburg, Germany
	THIS PRODUCT CONTAINS FLUORINATED GREENHOUSE GASES
CE	IP24
	Made in Malaysia
	R410A
	ACX012-08813

Indoor unit

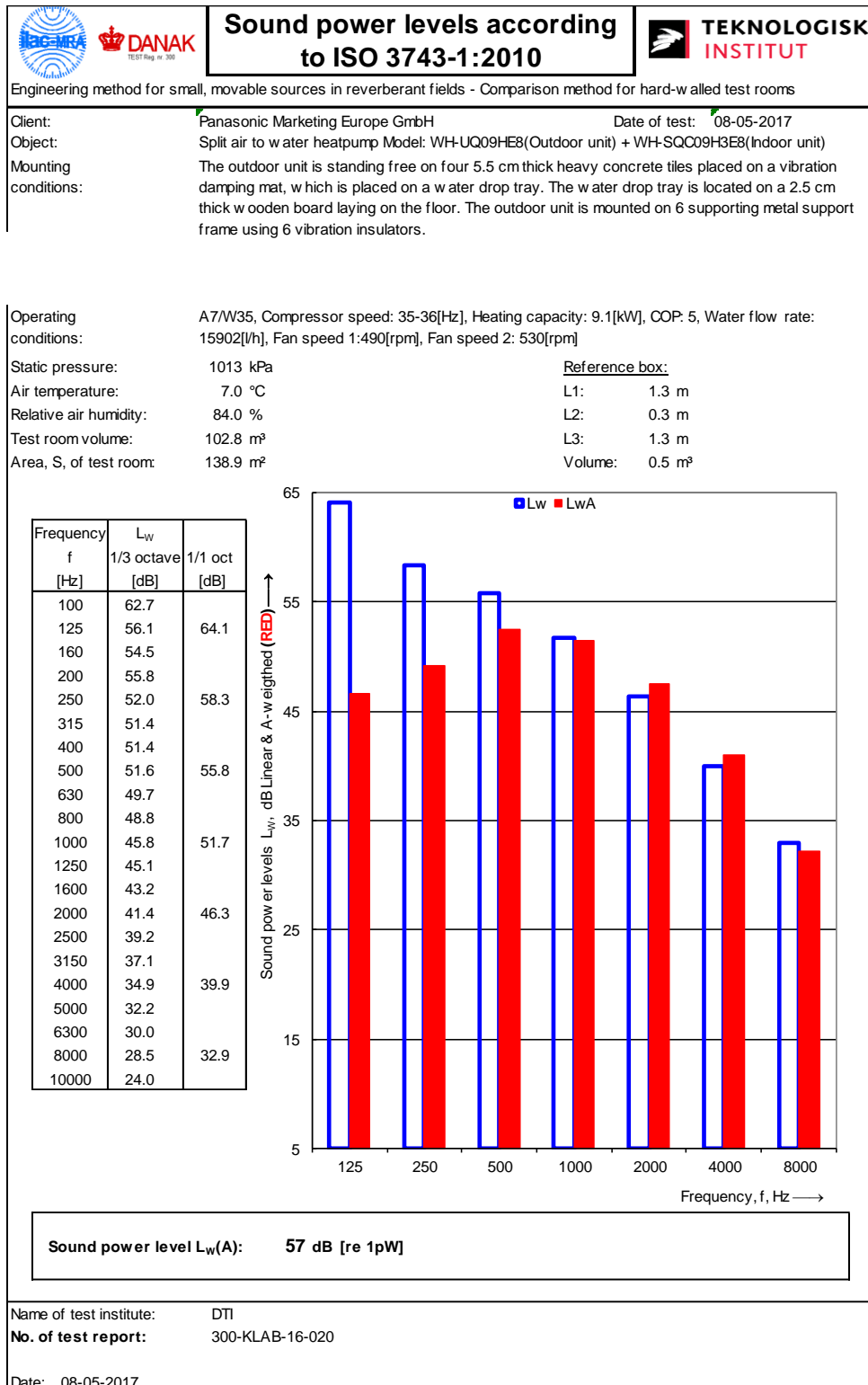


Rating plate - indoor unit

Panasonic	
AIR-TO-WATER HEATPUMP	
Model No.	WH-SQ09H3E8
OUTDOOR UNIT	WH-UQ09HE8
POWER SUPPLY 1	
RATED VOLTAGE	400V
PHASE	3N~
RATED FREQUENCY	50Hz
MAXIMUM INPUT	9.85kW/14.7A
(HEATPUMP UNIT + BACKUP HEATER)	
BACKUP HEATER	
RATED POWER	3.00kW
RATED CURRENT	4.3A
POWER SUPPLY 2	
(BOOSTER HEATER)	
RATED VOLTAGE	230V~
RATED FREQUENCY	50Hz
MAXIMUM POWER	3.00kW
MAXIMUM CURRENT	13.0A
MWP (WATER)	0.3MPa
HEATING WATER FLOW	1.5m³/h
COOLING WATER FLOW	1.2m³/h
SERIAL NO.	55174
PRODUCTION DATE	Panasonic Appliances
	Air-Conditioning Malaysia Sdn. Bhd.
	Shah Alam Malaysia
	Made in Malaysia
	Authorized representative in EU
	Panasonic Testing Centre
	Panasonic Marketing Europe GmbH
	Wiesbergweg 15, 22525 Hamburg, Germany
	R410A
CE	ACXF09-01370



Detailed test results - sound power level - test 1




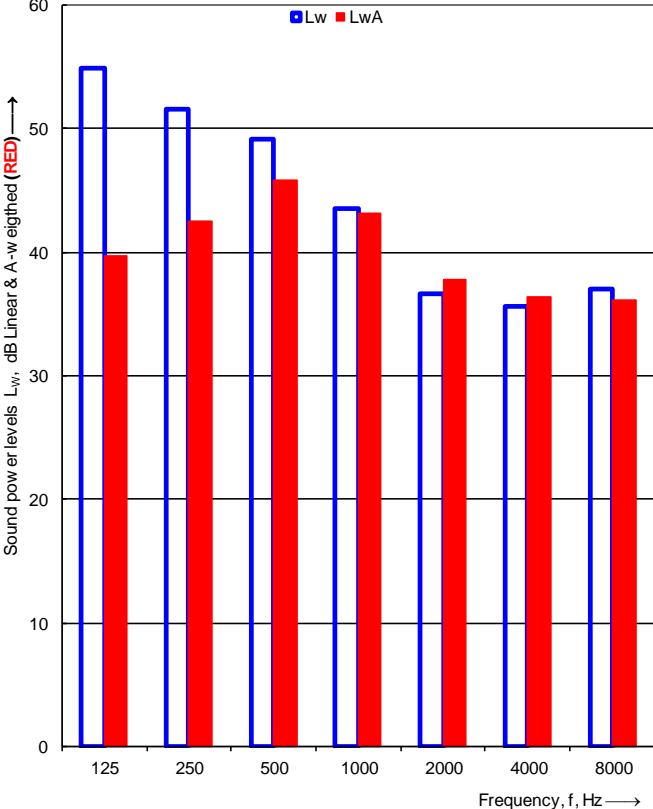




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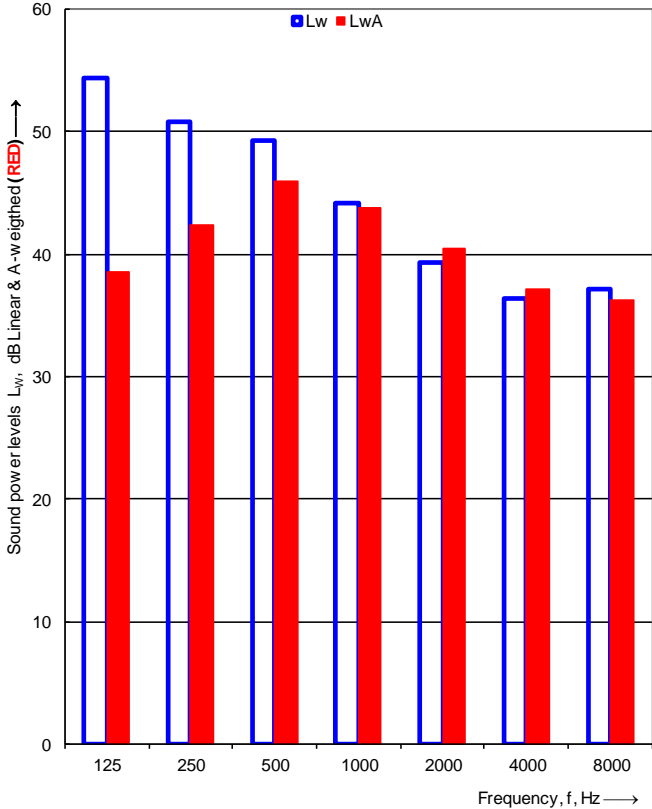
Page 7 of 12
300-KLAB-16-020

Detailed test results - sound power level - test 2

 		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:	Panasonic Marketing Europe GmbH		Date of test: 08-05-2017																																																																		
Object:	Split air to water heatpump Model: WH-UQ09HE8(Outdoor unit) + WH-SQC09H3E8(Indoor unit)																																																																				
Mounting conditions:	The outdoor unit is standing free on four 5.5 cm thick heavy concrete tiles placed on a vibration damping mat, which is placed on a water drop tray. The water drop tray is located on a 2.5 cm thick wooden board laying on the floor. The outdoor unit is mounted on 6 supporting metal support frame using 6 vibration insulators.																																																																				
Operating conditions:	A7/W35, Compressor speed: 25-26[Hz], Heating capacity: 5.49[kW], COP: 4.7, Water flow rate: 980[l/h], Fan speed 1:340[rpm], Fan speed 2: 380[rpm], Quiet mode level 3																																																																				
Static pressure:	1013 kPa	<u>Reference box:</u>																																																																			
Air temperature:	7.0 °C	L1: 1.3 m																																																																			
Relative air humidity:	84.0 %	L2: 0.3 m																																																																			
Test room volume:	102.8 m³	L3: 1.3 m																																																																			
Area, S, of test room:	138.9 m²	Volume: 0.5 m³																																																																			
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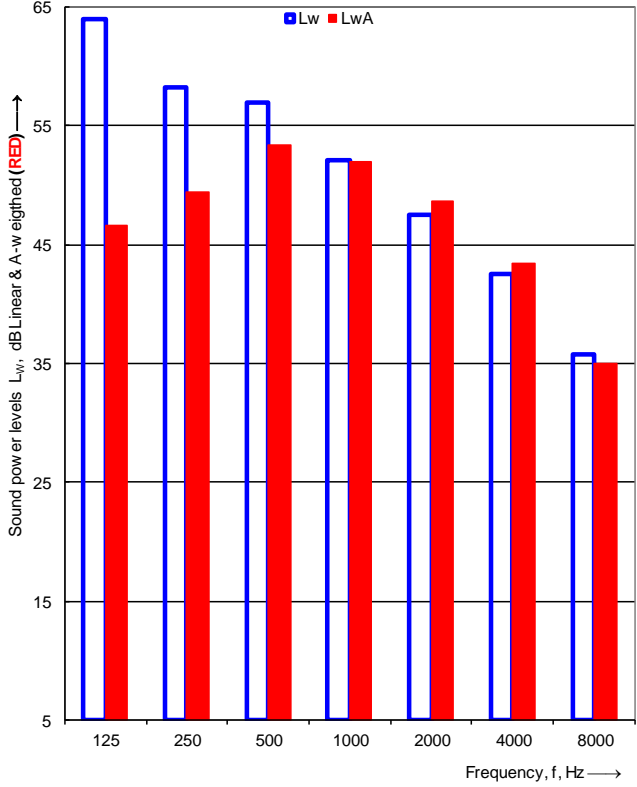


Detailed test results - sound power level - test 3

 		Sound power levels according to ISO 3743-1:2010	 TEKNOLOGISK INSTITUT																																																																		
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Operating conditions:	A7/W35, Compressor speed: 19-20[Hz], Heating capacity: 4.25[kW], COP: 4.36, Water flow rate: 770[l/h], Fan speed 1: 360[rpm], Fan speed 2: 400[rpm], Test mode 4																																																																				
Static pressure:	1013 kPa	<u>Reference box:</u>																																																																			
Air temperature:	7.0 °C	L1: 1.3 m																																																																			
Relative air humidity:	84.0 %	L2: 0.3 m																																																																			
Test room volume:	102.8 m³	L3: 1.3 m																																																																			
Area, S, of test room:	138.9 m²	Volume: 0.5 m³																																																																			
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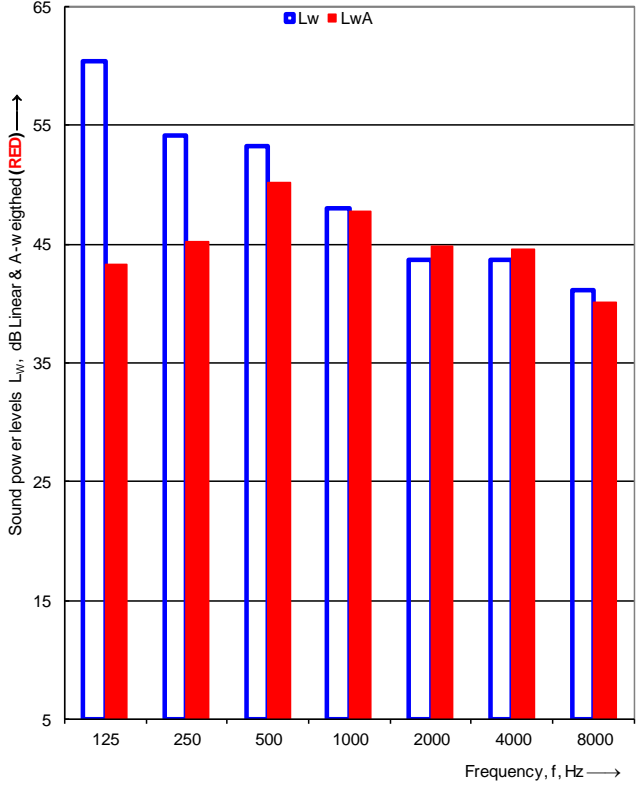


Detailed test results - sound power level - test 4

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Client:	Panasonic Marketing Europe GmbH		Date of test: 03-05-2017																																																																		
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Operating conditions:	A7/W55, Compressor speed: 40-41[Hz], Heating capacity: 9.01[kW], COP: 2.97, Water flow rate: 1163[l/h], Fan speed 1: 500[rpm], Fan speed 2: 540[rpm]																																																																				
Static pressure:	1013 kPa	<u>Reference box:</u>																																																																			
Air temperature:	7.0 °C	L1:	1.3 m																																																																		
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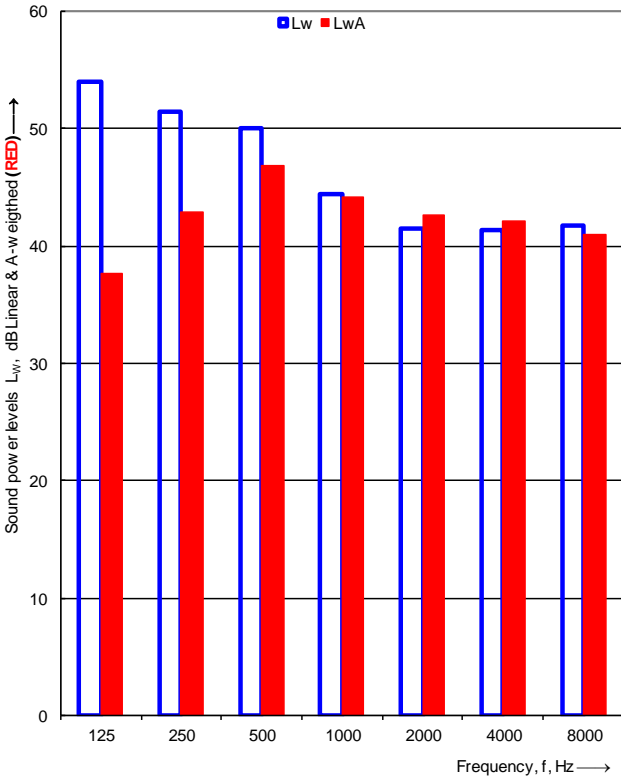


Detailed test results - sound power level - test 5

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Operating conditions:		A7/W55, Compressor speed: 29-30[Hz], Heating capacity: 4.5[kW], COP: 2.1, Water flow rate: 700[l/h], Fan speed 1: 350- 450[rpm], Fan speed 2: 390-490[rpm], Quiet mode 3																																																																			
Static pressure:	1013 kPa	<u>Reference box:</u>																																																																			
Air temperature:	7.0 °C	L1:	1.3 m																																																																		
Relative air humidity:	84.0 %	L2:	0.3 m																																																																		
Test room volume:	102.8 m³	L3:	1.3 m																																																																		
Area, S, of test room:	138.9 m²	Volume:	0.5 m³																																																																		
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Detailed test results - sound power level - test 6

 		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:		Panasonic Marketing Europe GmbH		Date of test: 05-05-2017																																																																			
Object:		Split air to water heatpump Model: WH-UQ09HEB(Outdoor unit) + WH-SQC09H3EB(Indoor unit)																																																																					
Mounting conditions:		The outdoor unit is standing free on four 5.5 cm thick heavy concrete tiles placed on a vibration damping mat, which is placed on a water drop tray. The water drop tray is located on a 2.5 cm thick wooden board laying on the floor. The outdoor unit is mounted on 6 supporting metal support frame using 6 vibration insulators.																																																																					
Operating conditions:		A7/W55, Compressor speed: 19-20[Hz], Heating capacity: 2.5[kW], COP: 1.7, Water flow rate: 700[l/h], Fan speed 1: 320-330[rpm], Fan speed 2: 360-370[rpm], Test mode 4																																																																					
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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 14511:2013
- EN 12102
- DS/EN 3743/1

The basic acoustic measurement standard DS/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.