

# TEST REPORT

Report no.:  
300-KLAB-20-002



**DANISH  
TECHNOLOGICAL  
INSTITUTE**

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www.teknologisk.dk

Page 1 of 15  
Init: KAMA/BBJN/PRES  
File no.: 906648  
Enclosures: 0

**Customer:** Company: Panasonic Marketing Europe GmbH  
Address: Hagenauer Strasse 43  
City: 65203 Wiesbaden  
Tel.: +49 1724 141441

**Component:** Brand: Panasonic  
Type: Air to water heat pump  
Model: Outdoor: WH-UD09JE5 Indoor: WH-ADC0309J3E5  
Series no.: Outdoor: 5621401261 Indoor: 5704001319  
Production year: 2019/2019

**Dates:** Component tested: January 2020

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

**Remarks:** The unit was delivered by the customer. The installation and test settings were done according to the manufacturer's instructions.  
The unit was delivered as model no. WH-UD07JE5, cf. the rating plates of the units. By changing the software, the unit was changed to model no. WH-UD09JE5.

**Terms:** The test has been performed according to the conditions laid down by DANAK (The Danish Accreditation), cf. [www.danak.dk](http://www.danak.dk), and the general terms and conditions of Danish Technological Institute. The results from DTI's work in this report, i.e. analyses, assessments and instructions may only be used or reported in their entirety. The customer may not mention or refer to DTI or DTI's employees for advertising or marketing purposes unless DTI has granted its written consent in each case.

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

**Date:** 2020.02.03

**Signature:**  
Kamalathasan Arumugam  
B.Sc. Engineer

**Co-reader:**  
Birger Bech Jessen  
Senior specialist



 **DANAK**  
Test Reg. nr. 300



## Objective

The objective of this report is to document the acoustical performance of the outdoor unit with different heat pump settings and setups.

The tests were carried out in following order (test 1-8):

Sound power measurement without any modification of the outdoor unit

1. With free mode at A7/W55
2. With free mode and quiet mode 3 at A7/W55

Sound power measurement with a soundproof kit mounted in the outdoor unit (in order to mount the soundproof kit, the enclosure materials of the compressor from the factory must be removed)

3. With free mode at A7/W55
4. With free mode and quiet mode 3 at A7/W55

Sound power measurement after removing the soundproof kit from the outdoor unit and the enclosure materials of the compressor from the factory being restored

5. With free mode at A7/W55
6. With free mode and quiet mode 3 at A7/W55

Sound power measurement with a noise reduction box mounted around the outdoor unit

7. With free mode at A7/W55
8. With free mode and quiet mode 3 at A7/W55

Sound power level of the outdoor unit according to EN 12102:2017 for average climate at the highest temperature application. The measurement of the sound power level is performed 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).





### Test order and conditions of sound power test according to EN12102

N°	Test condition		Heat pump setting			
	Outdoor heat exchanger (dry/wet bulb) (°C)	Indoor heat exchanger (inlet/outlet) (°C)	Compressor speed (Hz)	Fan speed Outdoor (rpm)	Heating capacity (kW)	Power input (kW)
1	7/6	47/55	65 – 67	680 - 700	8.43	3.2
2	7/6	47/55	45 – 46	510 – 520	5.50	2.1
3	7/6	47/55	65 – 67	680 - 700	8.43	3.2
4	7/6	47/55	45 – 46	510 – 520	5.50	2.1
5	7/6	47/55	65 – 67	680 - 700	8.43	3.2
6	7/6	47/55	45 – 46	510 – 520	5.50	2.1
7	7/6	47/55	65 – 67	680 - 700	8.43	3.2
8	7/6	47/55	45 – 46	510 – 520	5.50	2.1





### Results of sound power test according to EN12102

N°	Sound power level LW(A) [dB re 1pW]	Uncertainty (dB) (weighted value)
1	66.0	0.5
2	63.2	1.0
3	64.9	0.5
4	60.3	1.0
5	65.5	0.5
6	60.4	0.5
7	58.8	0.5
8	55.9	0.5

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.





Outdoor unit rating plate



Outdoor unit





## Indoor unit rating plate

**Panasonic**

AIR-TO-WATER HYDROMODULE + TANK

Model No. WH-ADC0309J3E5

OUTDOOR UNIT WH-UD03JE5  
WH-UD05JE5  
WH-UD07JE5  
WH-UD09JE5

POWER SUPPLY 1 (HEAT PUMP)  
RATED VOLTAGE 230V~  
RATED FREQUENCY 50Hz

POWER SUPPLY 2 (BACKUP HEATER)  
RATED VOLTAGE 230V~  
RATED FREQUENCY 50Hz  
MAXIMUM POWER 3.00kW  
MAXIMUM CURRENT 13.00A

MAX. WORKING PRESSURE MPa (Bar)  
- SPACE HEAT/COOL 0.3 (3.0)  
- TANK CIRCUIT 0.8 (8.0)

TANK UNIT CAPACITY (NETT) 185L

Panasonic AVC Networks Czech, s.r.o.  
U Panasoniku 1, 320 84 Plzeň, Czech Republic  
Assembled in the Czech Republic

Authorized representative in EU  
Panasonic Testing Centre  
Panasonic Marketing Europe GmbH  
Winsberggring 15, 22525 Hamburg, Germany

SERIAL NO. **5704001319**

CE

IP21

ACXF09-04700

R32




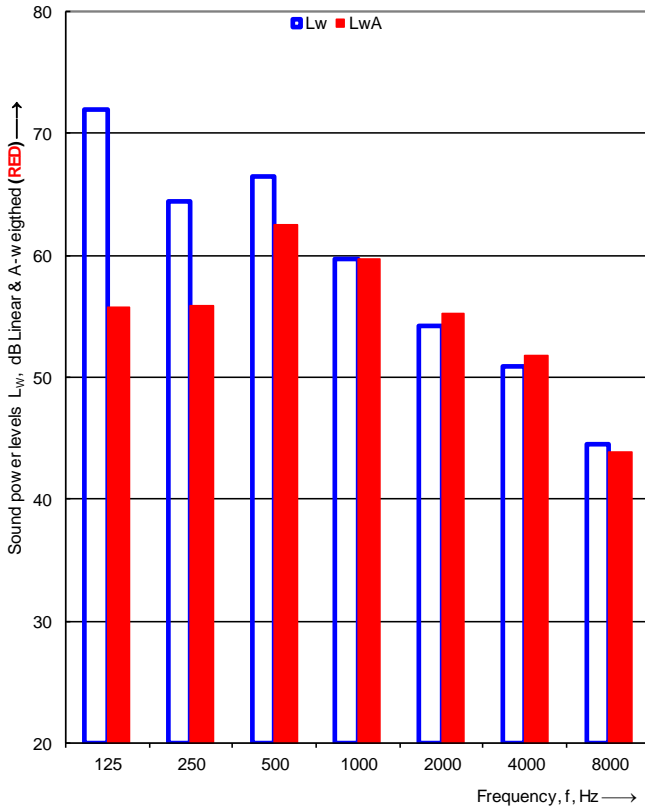
PRODUCTION DATE 2019.05

## Indoor unit





## Detailed test results of sound power measurement N° 1

 		<b>Sound power levels according to ISO 3743-1:2010</b>		 <b>TEKNOLOGISK INSTITUT</b>																																																																			
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## Detailed test results of sound power measurement N° 2



### Sound power levels according to ISO 3743-1:2010



**TEKNOLOGISK  
INSTITUT**

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Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms

Client:	Panasonic Europe GmbH	Date of test:	21-01-2020
Object:	Type: Split Air to water heat pump Model: WH-UD09JE5 (OD) + WH-ADC0309J3E5 (ID)		
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 the supporting metal support frame using 4 vibration isolators. Test without any modification of the outdoor unit.		

Operating conditions: A7/W55, Quiet mode 3, Compressor speed: 45 - 46 [Hz], Heating capacity: 5.5 [kW], Power\_input: 2.1 [kW], Water flow rate: 600 [l/h], Fan\_speed : 510 - 520 [rpm], dp\_water : 290 [mbar]

Static pressure:	1031 kPa
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Air temperature: 7.0 °C

Relative air humidity: 85.0 %

Test room volume: 102.8 m<sup>3</sup>

Area,  $S$ , of test room: 138.9 m<sup>2</sup>

Room: Room 1

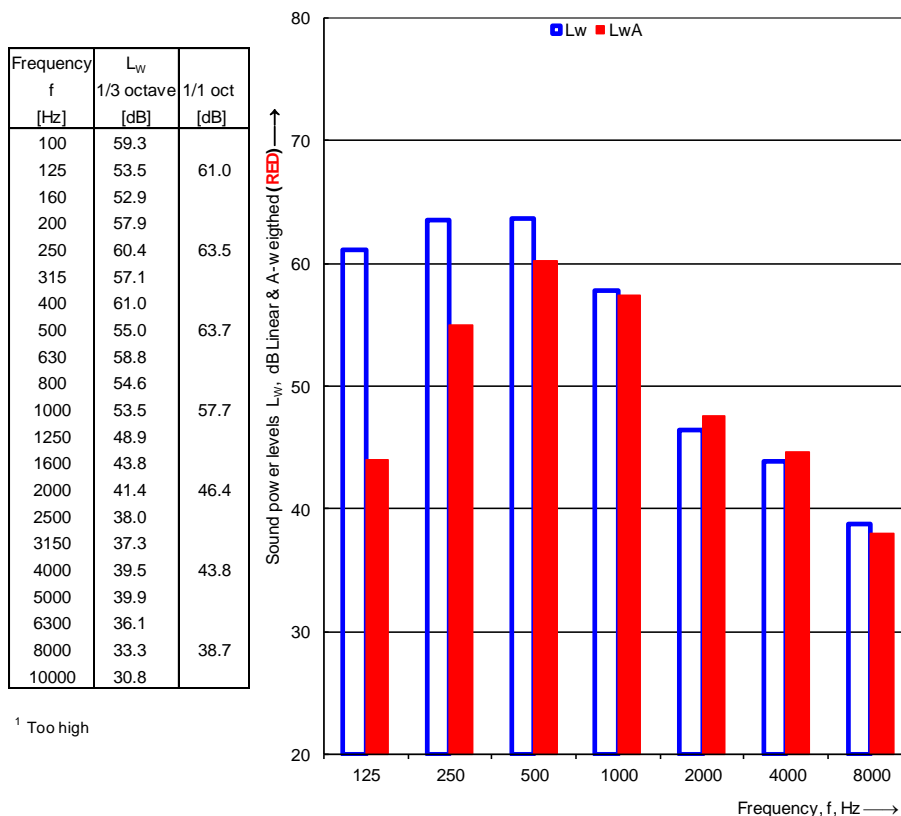
Reference box:

L1: 0.9 m

L2: 0.3 m

L3: 0.8 m

Volume: 0.2 m<sup>3</sup>

<sup>1</sup> Too high

**Sound power level  $L_w(A)$ : 63.2 dB [re 1pW]**

Name of test institute: DTI

**No. of test report:** 300-KLAB-20-002

Date: 21-01-2020




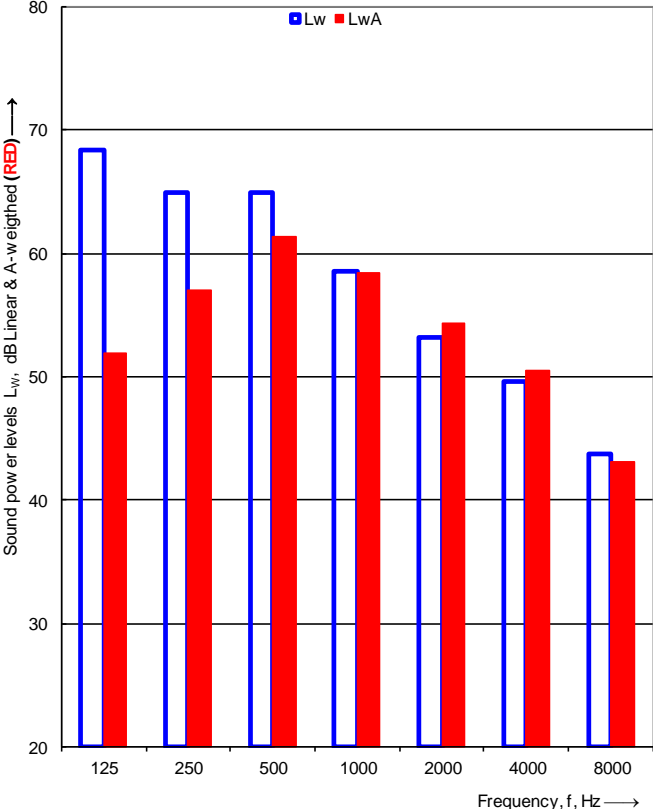


Test Reg. nr. 300








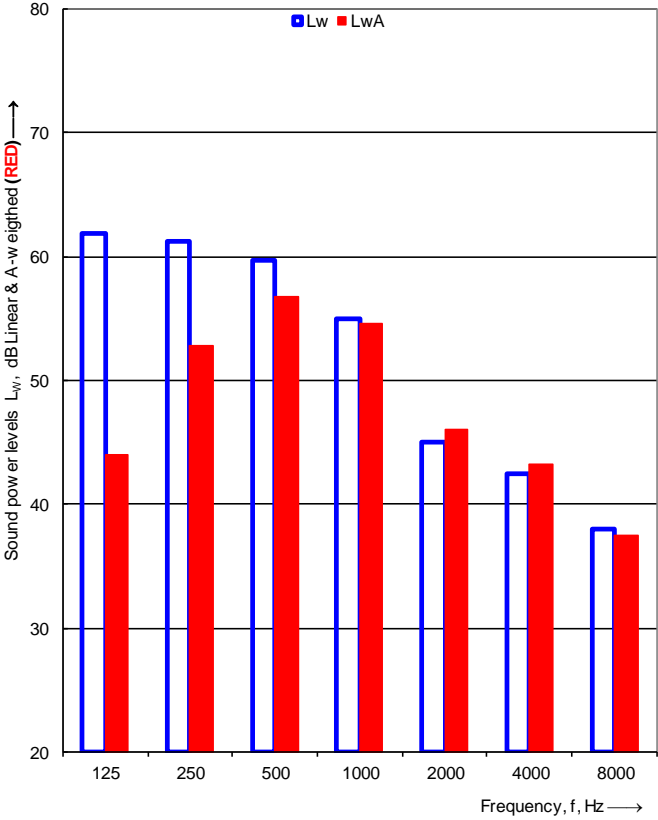
## Detailed test results of sound power measurement N° 3

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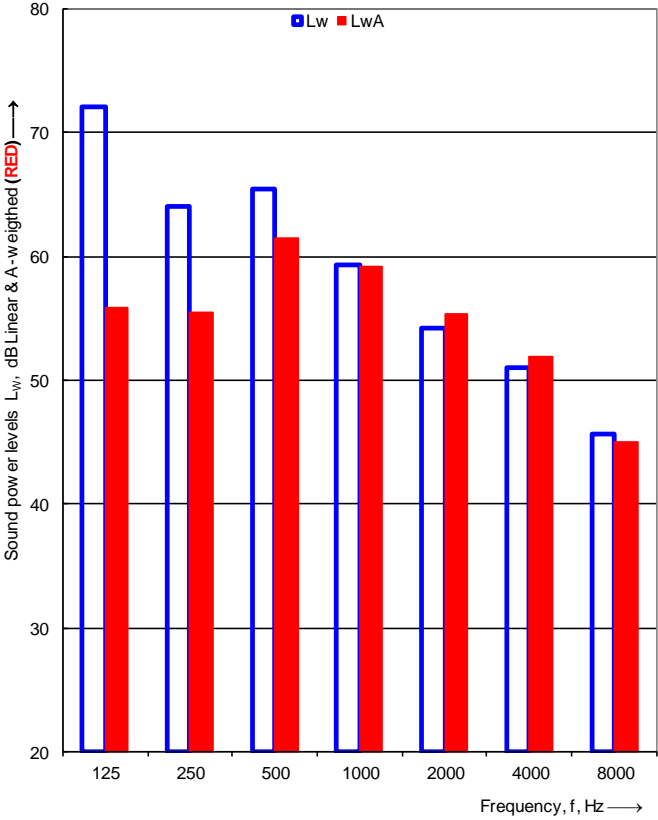


## Detailed test results of sound power measurement N° 4

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<b>Sound power level L<sub>w</sub>(A): 60.3 dB [re 1pW]</b>																																																																							
Name of test institute:		DTI																																																																					
No. of test report:		300-KLAB-20-002																																																																					
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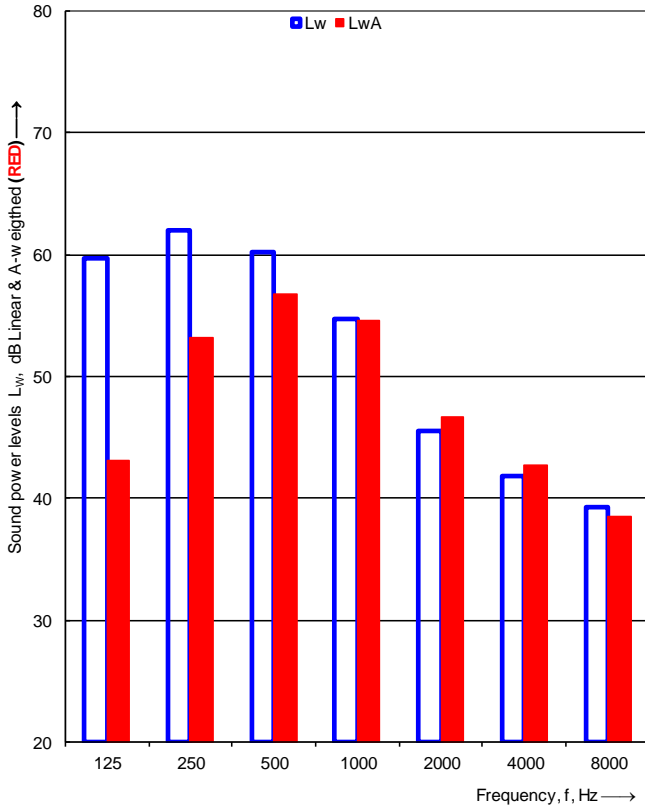
## Detailed test results of sound power measurement N° 5

 		<b>Sound power levels according to ISO 3743-1:2010</b>		 <b>TEKNOLOGISK INSTITUT</b>																																																																			
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms																																																																							
Client:		Panasonic Europe GmbH		Date of test: 28-01-2020																																																																			
Object:		Type: Split Air to water heat pump Model: WH-UD09JE5 (OD) + WH-ADC0309J3E5 (ID)																																																																					
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 the supporting metal support frame using 4 vibration isolators. Test after removing the soundproof kit from the outdoor unit and the enclosure materials of the compressor from the factory being restored.																																																																					
Operating conditions:		A7/W55, Compressor speed: 65 - 67[Hz], Heating capacity: 8.43 [kW], Power input: 3.2 [kW], Water flow rate: 940 [l/h], Fan speed : 680 - 700 [rpm], dp water : 400 [mbar]																																																																					
Static pressure:		1031 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: 0.8 m																																																																			
				Volume: 0.2 m³																																																																			
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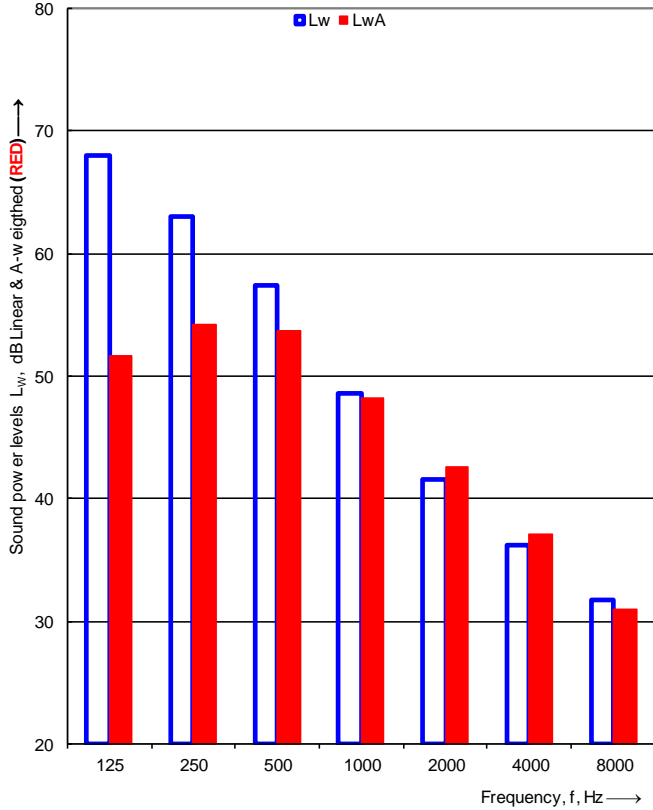


## Detailed test results of sound power measurement N° 6

 		<b>Sound power levels according to ISO 3743-1:2010</b>		 <b>TEKNOLOGISK INSTITUT</b>																																																																			
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms																																																																							
Client:		Panasonic Europe GmbH		Date of test: 28-01-2020																																																																			
Object:		Type: Split Air to water heat pump Model: WH-UD09JE5 (OD) + WH-ADC0309J3E5 (ID)																																																																					
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 the supporting metal support frame using 4 vibration isolators. Test after removing the soundproof kit from the outdoor unit and the enclosure materials of the compressor from the factory being restored.																																																																					
Operating conditions:		A7/W55, Quiet mode 3, Compressor speed: 45 - 46 [Hz], Heating capacity: 5.5 [kW], Power_input: 2.1 [kW], Water flow rate: 600 [l/h], Fan_speed : 510 - 520 [rpm], dp_water : 290 [mbar]																																																																					
Static pressure: 1031 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: 0.8 m																																																																			
Area, S, of test room: 138.9 m²				Volume: 0.2 m³																																																																			
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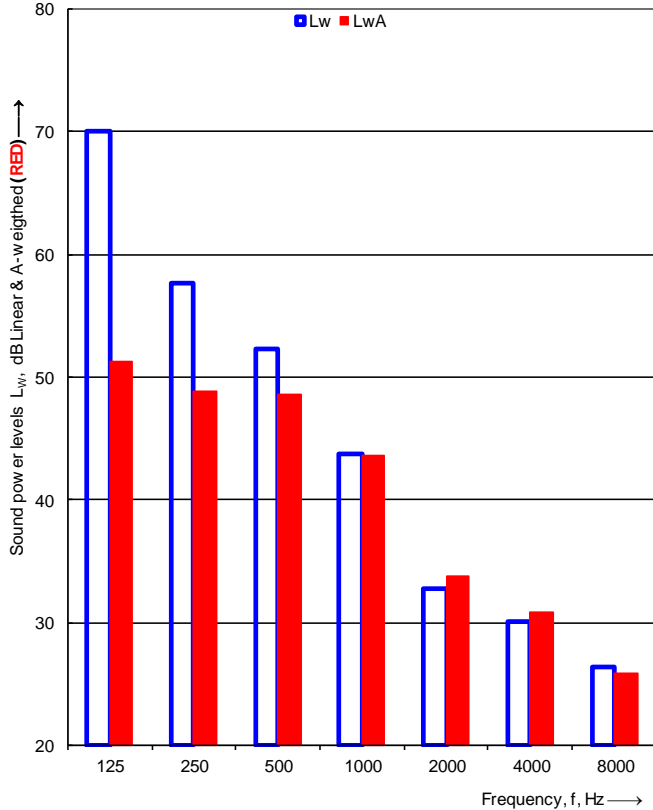
## Detailed test results of sound power measurement N° 7

 		<b>Sound power levels according to ISO 3743-1:2010</b>		 <b>TEKNOLOGISK INSTITUT</b>																																																																			
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms																																																																							
Client:		Panasonic Europe GmbH		Date of test: 30-01-2020																																																																			
Object:		Type: Split Air to water heat pump Model: WH-UD09JE5 (OD) + WH-ADC0309J3E5 (ID)																																																																					
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. Test with a noise reduction box mounted around the outdoor unit.																																																																					
Operating conditions:		A7/W55, Compressor speed: 65 - 67 [Hz], Heating capacity: 8.43 [kW], Power input: 3.2 [kW], Water flow rate: 940 [l/h], Fan speed: 680 - 700 [rpm], dp water: 400 [mbar]																																																																					
Static pressure: 992 kPa		Room: Room 1		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				L3: 0.8 m																																																																			
Area, S, of test room: 138.9 m²				Volume: 0.2 m³																																																																			
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No. of test report:		300-KLAB-20-002																																																																					
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## Detailed test results of sound power measurement N° 8

 		<b>Sound power levels according to ISO 3743-1:2010</b>		 <b>TEKNOLOGISK INSTITUT</b>																																																																		
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms																																																																						
Client:		Panasonic Europe GmbH		Date of test: 30-01-2020																																																																		
Object:		Type: Split Air to water heat pump Model: WH-UD09JE5 (OD) + WH-ADC0309J3E5 (ID)																																																																				
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. Test with noise reduction box mounted around the outdoor unit.																																																																				
Operating conditions:		A7/W55, Quiet mode 3, Compressor speed: 45 - 46 [Hz], Heating capacity: 5.5 [kW], Power_input: 2.1 [kW], Water flow rate: 600 [l/h], Fan_speed: 510 - 520 [rpm], dp_water: 487 [mbar]																																																																				
Static pressure:		992 kPa		Reference box:																																																																		
Air temperature:		7.0 °C		L1: 0.9 m																																																																		
Relative air humidity:		85.0 %		L2: 0.3 m																																																																		
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Date:		30-01-2020																																																																				



## 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 12102:2017
- 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.

