

## Test report no. WP.24.LW.431

### Testing of an air/water heat pump

**Client :** KOSPEL Spółka z o.o.  
ul. Olchowa 1  
PL-75-136 Koszalin

**Test item:** Air/water heat pump, clients name  
**HPMO2-12**

**Test center:** Prüfstelle HLK der Universität Stuttgart  
Institut für Gebäudeenergetik, Thermotechnik und  
Energiespeicherung  
Pfaffenwaldring 6A  
D-70569 Stuttgart, Germany

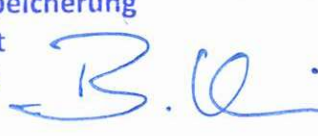
**Performed tests:** Tests according to  
**DIN EN 14511:2023**  
**DIN EN 14825:2023**  
**DIN EN 12102-1:2018**

**Test result:** Measured annual efficiency  
**AC/LT  $\eta_s=168\%$**   
**AC/MT  $\eta_s=132\%$**

Stuttgart, den 24.06.2024

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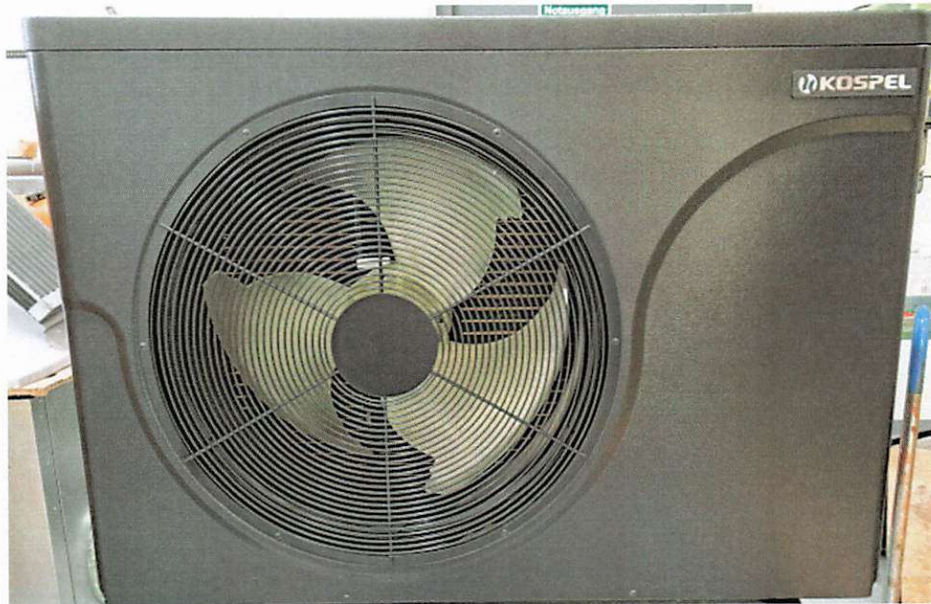
## 1 Test item

Arrival of the test item:

09.04.2024

### 1.1 Description of the device

The test item is an air/water heat pump with electrical driven compressor in compact design.



**Figure 1: Test item**

The outdoor unit contains a compressor, an evaporator, a condenser and a fan. The capacity of the compressor is variable. Indoor and outdoor unit are connected with a refrigerant circuit.

### 1.2 Dimensions

	LxHxW in cm
Outdoor unit	128x93x46



### 1.3 Main components

	Type (manufacturer)
Refrigerant	R32
Compressor*	9RD220ZAA2J (Panasonic Electric)
Condenser*	F85Hx30 (SWEP)
Circulation pump(s)*	N/A
Expansion valve*	DPF(TS1) 1.65 C07 (Zhejiang Sanhua)
Evaporator*	80600996 (GuangZhou YaoHua)
Fan*	FKGW01ALQ (Panasonic Appliances)

\*Manufacturer declaration

### 1.4 Data label

Main declarations of data label:

Manufacturer	KOSPEL Sp. z. o. o.
Type	HPMO2-12
Serial number	HNG12EU10Z00281
Refrigerant	R32
Filling quantity	1,8kg



## **2 Boundary conditions**

Date of the test:

18.04.2024-15.05.2024

### **2.1 Test rig**

The efficiency tests were performed on the test rig PRC5.

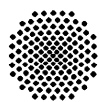
All measurement devices are subjected to measurement equipment monitoring. The calibration status is stored in the internal database.

The requirements of the measurement standards are fulfilled.

### **2.2 Setup**

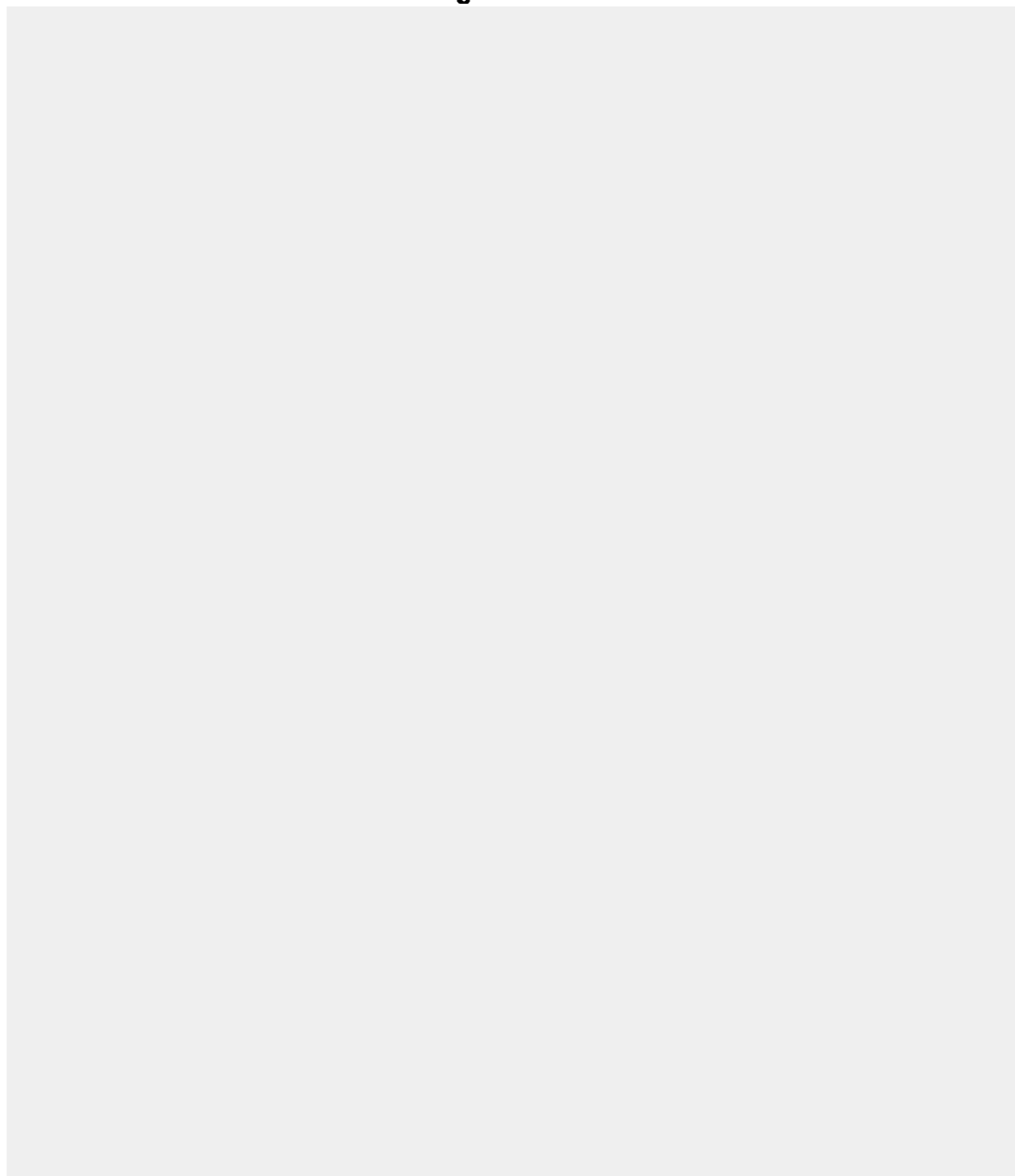
For determination of COP the heating capacity was measured at the outlet of the outdoor unit. Pressure difference for the pump correction was measured at the outlet of the outdoor unit.

The maximum compressor frequency was set in the service menu of the control.



### **3 Test according EN 14511**

#### **3.1 Performance test heating condition**





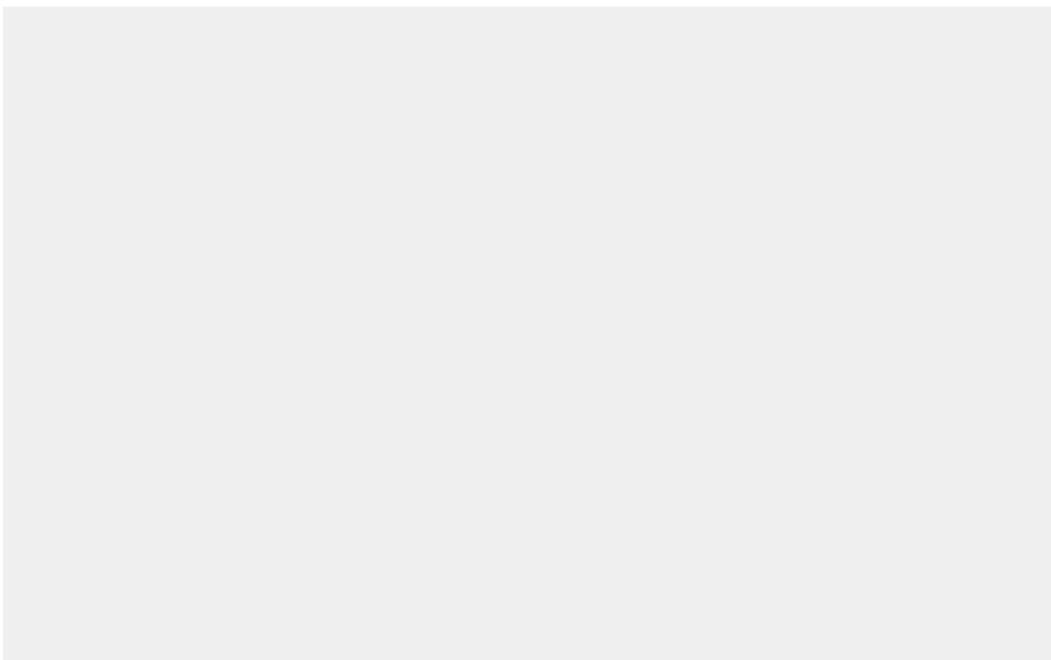
## 4 Test according EN12102

### 4.1 Setup

The sound power level of the outdoor unit was measured in the climate chamber according to EN 12102 with the method according to EN ISO 9614-2. The measurement meets the requirements of class 2.

### 4.2 Measurement point

The sound test was performed at the following operation point:



### 4.3 Results

The following values were measured on the unit. The values corresponds to the performance points in chapter 4.2:

Performance point (see chapter 3.1)	Sound power level
S1 (ODU)	55,5 dB(A)

The detailed values of the test points are in chapter A.2.



## 5 Test according EN 14825

### 5.1 General

The device has an outdoor temperature control. Therefore it was measured for variable outlet and fix flow.

### 5.2 Power consumption

			AC/LT	AC/MT
Thermostat off	P_TO	W	53	20
Standby	P_SB	W	15	15
Power off mode	P_OFF	W	15	15
Crankcase heater	P_CK	W	0	0

### 5.3 Performance test heating mode

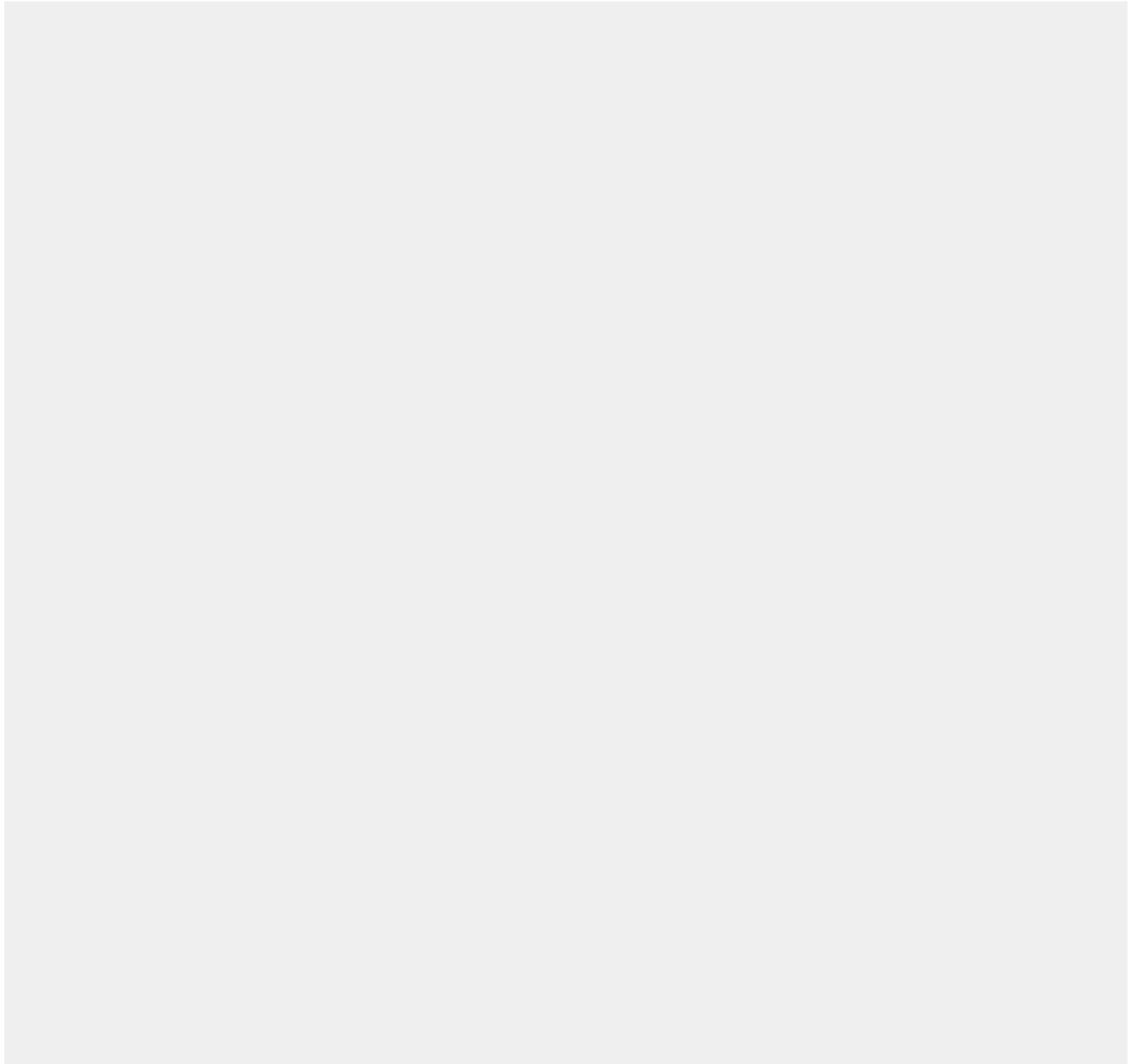
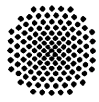
#### 5.3.1 Average climate, low temperature (AC/LT)

The device is declared with a P\_design of 8,9kW and a bivalent point of A-10

Set values:

			LT	E	A	B	C	D
			Design	TOL	A-7	A2	A7	A12
Outdoor air	T <sub>outdoor</sub>	°C	-10	-10	-7	2	7	12
Capacity ratio	CR <sub>target</sub>	%	113	113	100	61	39	17
Variable outlet	T <sub>outlet</sub>	°C	35	35	34	30	27	24
Part load capacity	P <sub>h</sub>	kW	8,9	8,9	7,9	4,8	3,1	1,4



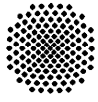




The following values were calculated with the template for heat pump keymark Version 2021\_02\_02:

	Outdoor air	Water outlet	Part load ratio	Part load	Measured capacity heatpump	Measured efficiency heatpump			Efficiency heatpump at part load
	$T_i$	$T_{\text{outlet}}$	PLR	$P_h$	$P_{hp}$	$COP_d$	$Cd_h$	CR	$COP_{bin}$
	°C	°C	%	kW	kW	-	-	-	-
A	-7	34	88	7,9	8,0	3,33	1,00	0,98	3,33
B	2	30	54	4,8	5,1	4,37	1,00	0,93	4,37
C	7	27	35	3,1	3,8	4,69	0,93	0,81	4,62
D	12	24	15	1,4	5,1	7,42	0,92	0,27	6,13
E (TOL)	-10	35	100	8,9	8,5	3,06	1,00	1,00	3,06
F (BIV)	-10	34	100	8,9	8,5	3,06	1,00	1,00	3,06

Energy Efficiency			
$SCOP_{on}$	SCOP	$\eta_s$	$Q_{HE}$
-	-	%	kWh
4,33	4,27	167,8	4307



### 5.3.2 Average climate, medium temperature (AC/MT)

The device is declared with a  $P_{\text{design}}$  of 8,7kW and a bivalent point of A-10

Set values:



The following values were calculated with the template for heat pump keymark Version 2021\_02\_02:

	Outdoor air	Water outlet	Part load ratio	Part load	Measured capacity heatpump	Measured efficiency heatpump			Efficiency heatpump at part load
	$T_i$	$T_{outlet}$	PLR	$P_h$	$P_{hp}$	$COP_d$	$Cd_h$	CR	$COP_{bin}$
	°C	°C	%	kW	kW	-	-	-	-
A	-7	52	88	7,7	7,7	2,25	1,00	1,00	2,25
B	2	42	54	4,7	5,1	3,46	1,00	0,91	3,46
C	7	36	35	3,0	4,1	4,26	0,95	0,73	4,18
D	12	30	15	1,3	4,0	4,65	0,94	0,33	4,14
E (TOL)	-10	55	100	8,7	8,4	2,20	1,00	1,00	2,20
F (BIV)	-10	34	100	8,7	8,4	2,20	1,00	1,00	2,20

Energy Efficiency			
$SCOP_{on}$	SCOP	$\eta_s$	$Q_{HE}$
-	-	%	kWh
3,42	3,38	132,2	5319



## A. Appendix

### A.1. Fotos







Inwerterowa Pompa ciepła / Inverter Heat pump / Inverter Wärmepumpe / Инверторный тепловой насос	
HPM2.Z 	
Numer fabryczny / Serial no. / Herstellnummer / Заводской номер	
HNG12EU01Z00281 	
HPM02-12	
Rok produkcji / Year of construction / Herstelljahr / Дата производства	
2022	
Stopień ochrony / IP Water Resistance / Wärmepumpe / Степень защиты	
IPX4	
Zasilanie elektryczne / Electrical supply / Nennspannung Wärmepumpe / Электропитание	
220-240V~/50Hz	
Klasa ochrony przed porażeniem elektrycznym / Class of protection against electric shock / Schutzklasse gegen elektrischen Schock / Класс защиты от поражения электрическим током	
I	
Prąd znamionowy wyłącznika nadprądowego / MCB fuse / Gerätabsticherung / Номинальный ток выключателя макс. тока	
25 A	
Znamionowy pobór mocy / Rated power consumption / Nennleistungsaufnahme / Номинальная потребляемая мощность	
4.95 kW	
Znamionowa wydajność ciepła / Rated thermal capacity / Nennwärmeleistung / Номинальная производительность тепла	
A7/W35: 3.80-12.50kW	
Znamionowy prąd roboczy / Rated operating current / Nennbetriebsstrom / Номинальный рабочий ток	
21.4 A	
Obieg chłodniczy / Refrigerant circuit / Kältekreis / Контур хладагента	
Czynnik chłodniczy / Ilość / GWP / Ekwiwalent CO <sub>2</sub> Refrigerant / volume / GWP / CO <sub>2</sub> -eq Kältemedium/Menge/GWP/CO <sub>2</sub> -Äquivalent Хладагент / объем наполнения / GWP / эквивалент CO <sub>2</sub>	
R32/1.8kg/675/1.22t	
Maksymalne ciśnienie robocze czynnika chłodniczego HP/LP Max. working pressure of refrigerant circuit HP/LP MAX Betriebsdruck von Kältemedium Максимальное рабочее давление хладагента HP/LP	
4.4/2.1MPa	
Natężenie przepływu wody / Water flow volume / Wasserdurchflussmenge / Объем потока воды	
1.7 m <sup>3</sup> /h	
Urządzenie zawiera fluorowane gazy cieplarniane objęte protokołem z Kioto This appliance contains fluorinated greenhouse gases included in the Kyoto protocol. Dieses Gerät enthält vom Kyoto-Protokoll erfasste fluorierte Treibhausgase Устройство содержит фторированные парниковые газы, подпадающие под действие Киотского протокола	
KOSPEL Sp. z o.o. ul. Olchowa 1 75-136 Koszalin / Poland	
   	

Figure 2: Data label

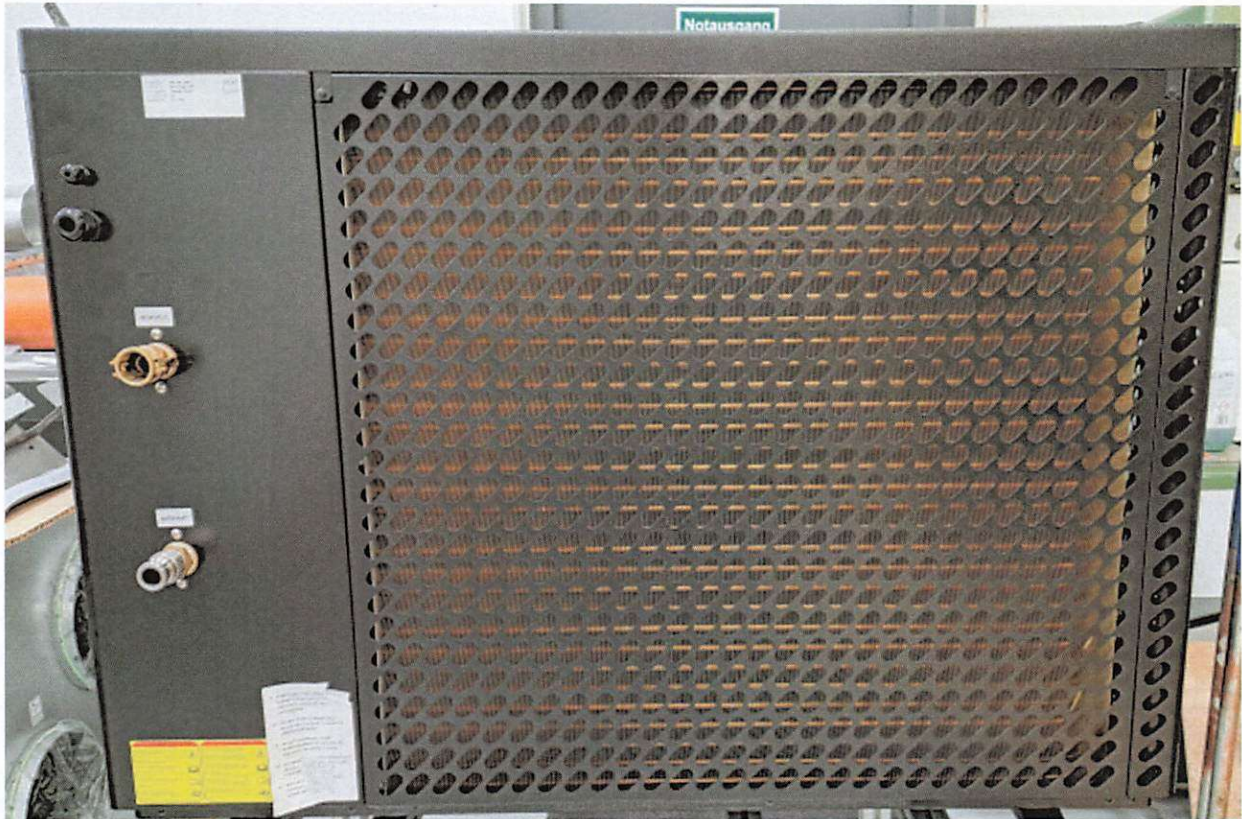


Figure 3: Test item



## A.2. Detailed values of sound test

