DAIKIN AC
absolute comfort

Daikin AC (Americas), Inc.
1645 Wallace Drive, Suite 110
Carrollton, TX 75006 USA

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www.daikinac.com

January 8, 2010

Compliance/Certification of Daikin Altherma
Appliance Standards Program (EE-2J)
U.S. Department of Energy
1000 Independence Ave., SW
Washington, DC 20585-0121

RE: ENERGY EFFICIENCY CERTIFICATION OF DAIKIN ALTHERMA – COMPLIANCE STATEMENT AND CERTIFICATION REPORT SUBMISSION TO THE U.S. DEPARTMENT OF ENERGY FOR COMPLIANCE WITH THE ENERGY CONSERVATION STANDARDS ESTABLISHED FOR CERTAIN CONSUMER PRODUCTS UNDER 10 CFR PART 430.

Ladies and Gentlemen:

Daikin AC (Americas), Inc. (Daikin) respectfully submits the following documents in response to the United States Department of Energy's (DOE) Federal Register Notice /Vol. 74, No. 235 /Wednesday, December 9, 2009 /65105 request for energy efficiency certification for certain consumer products under 10 CFR Part 430.

1. Signed Compliance Statement for the Daikin Altherma - containing information in the format set forth in Appendix A to Subpart F of Part 430.

2. Certification Report for the Daikin Altherma - containing information in the format set forth in Appendix A to Subpart F of Part 430.

Respectfully submitted,

Lee Smith
Director – Product, Engineering and Applications

Appendix A to Subpart F of Part 430 - Compliance Statement

COMPLIANCE STATEMENT

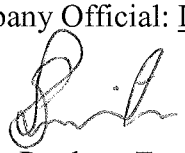
Product: DOE-Covered Split-System and Single Package Unitary Air-Conditioners and Heat Pumps as established in 10 C.F.R. Part 430, Subpart B, Appendix M (2009),1 - Daikin Altherma system, an air-to-water heat pump system that performs a hydronic heating function but can also be configured to serve domestic hot water requirements and also cooling as necessary.

Manufacturer's Name and Address:

Daikin Europe N.V.
c/o Daikin AC (Americas), Inc. – local sales company
1645 Wallace Drive, Suite 110
Carrollton, TX 75006

This compliance statement and all certification reports submitted are in accordance with 10 CFR Part 430 (Energy or Water Conservation Program for Consumer Products) and the Energy Policy and Conservation Act, as amended. The compliance statement is signed by a responsible official of the above named company. The basic model(s) listed in certification reports comply with the applicable energy conservation standard or water (in the case of faucets, showerheads, water closets, and urinals) conservation standard. All testing on which the certification reports are based was conducted in conformance with applicable test requirements prescribed in the Department of Energy (Case No. CAC-025) - Notice of petition for waiver, granting of application for interim waiver, and request for comments as published in the Federal Register / Vol. 74, No. 239 / Tuesday, December 15, 2009 / Notices No 66324. All information reported in the certification report(s) is true, accurate, and complete. The company is aware of the penalties associated with violations of the Act, the regulations thereunder, and is also aware of the provisions contained in 18 U.S.C. 1001, which prohibits knowingly making false statements to the Federal Government.

Name of Company Official: Lee Smith

Signature: 

Title: Director - Product, Engineering & Applications

Firm or Organization: Daikin AC (Americas), Inc

Address: 1645 Wallace Drive, Suite 110, Carrollton, TX 75006

Telephone Number: (972) 512-1909; Facsimile Number: (972) 245-1038

Date: January 8, 2010

Appendix A to Subpart F of Part 430 - Certification Report

CERTIFICATION REPORT

Date: January 8, 2010

Product Type:

DOE-Covered Split-System and Single Package Unitary Air-Conditioners and Heat Pumps as established in 10 C.F.R. Part 430, Subpart B, Appendix M - Daikin Altherma system, an air-to-water heat pump system that performs a hydronic heating function but can also be configured to serve domestic hot requirements and also cooling as necessary.

Product Class: 10 C.F.R. Part 430, Subpart B, Appendix M

Manufacturer: Daikin Europe N.V.
c/o Daikin AC (Americas), Inc. (local sales company)

Name: Lee Smith

Title: Director - Product, Engineering & Applications

Address: 1645 Wallace Drive, Suite 110, Carrollton, TX 75006

Telephone Number: (972) 512-1909

Facsimile Number: (972) 245-1038

U.S. Model No.	EU Model No.	SEER	EER	HSPF	COP	Energy Factor	SPF	Rated Storage Volume
ERLQ036BAVJU	ERLQ011BAV3	Waiver	12.17	Waiver	4.34	Waiver	Calculated at equipment selection	N/A
ERLQ048BAVJU	ERLQ014BAV3	Waiver	9.95	Waiver	4.24	Waiver		N/A
ERLQ054BAVJU	ERLQ016BAV3	Waiver	8.73	Waiver	4.03	Waiver		N/A
EDLQ036BA6VJU	EDLQ011BA6V3	Waiver	N/A	Waiver	4.32	Waiver		N/A
EDLQ048BA6VJU	EDLQ014BA6V3	Waiver	N/A	Waiver	4.2	Waiver		N/A
EDLQ054BA6VJU	EDLQ016BA6V3	Waiver	N/A	Waiver	4.07	Waiver		N/A
EBLQ036BA6VJU	EBLQ011BA6V3	Waiver	11.2	Waiver	4.32	Waiver		N/A
EBLQ048BA6VJU	EBLQ014BA6V3	Waiver	9.41	Waiver	4.2	Waiver		N/A
EBLQ054BA6VJU	EBLQ016BA6V3	Waiver	8.86	Waiver	4.07	Waiver		N/A
EKHWS050BA3VJU	EKHWS200B3V3	Waiver	N/A	Waiver	N/A	Waiver		50 Gallon
EKHWS080BA3VJU	EKHWS300B3V3	Waiver	N/A	Waiver	N/A	Waiver		80 Gallon

For 3rd Party Certification report, please review the attached sample test result.

Overview Altherma GQI - Measurement Results

Outdoor	ERHQ011W	ERHQ0014W	ERHQ0014W
Indoor	EKHBX016A	EKHBX016A	EKHBX016A

HEATING PERFORMANCE

Standard Condition : Heating Ta DB/WB 7/6°C - LWC 35°C (DT = 5°C)
FLOORHEATING

Labo	CETIAT	WPZ	
Capacity	11,23	14,9	
Power Input	2,37	3,29	
COP	**4,74**	**4,53**	
Required COP	No Target	No Target	No Target
DENV Target COP	4,39	4,29	4,08

Condition 1 : Heating Ta DB/WB 2/1°C - LWC 35°C (DT = 5°C)
FLOORHEATING

Labo		WPZ	
Capacity		10,35	
Power Input		3,04	
COP		**3,40**	
Required COP	3,1	3,1	3,1
DENV Target COP	3,17	3,1	3,1

Condition 2 : Heating Ta DB/WB 2/1°C - LWC 45°C (DT = 5°C)
FAN COILS

No Certification Point

COOLING PERFORMANCE

Condition 1 : Cooling Ta DB 35°C - LWC 7°C (DT = 5°C)
STANDARD POINT

Labo	CETIAT		
Capacity	10,32		
Power Input	3,39		
EER	**3,04**		
Required EER	2,2	2,2	2,2
DENV Target EER	2,71	2,32	2,2

Condition 2 : Cooling Ta DB 35°C - LWC 18°C (DT = 5°C)
FLOORHEATING

Labo	CETIAT		
Capacity	14,3		
Power Input	3,56		
EER	**4,02**		
Required EER	2,2	2,2	2,2
DENV Target EER	3,67	2,95	2,59

SOUND Power

Labo	CETIAT	WPZ	
Outdoor	63,2	64,4	
DENV Target	64	64	66

CETIAT
ensemble, innover et valider

EUROVENT CERTIFICATION

62 Boulevard de Sébastopol
75003 PARIS

For the attention of Mr OUHEMMOU

Villeurbanne, January 12 th 2008

Person in charge :
Alain MEYER

Signature :

cofrac
ESSAIS
ACCREDITATION
N°1-0021
PORTEE
DISPONIBLE SUR
WWW.COFRAC.FR

Test report N° 2819043
Version 00

EUROVENT CERTIFICATION PROGRAM
LIQUID CHILLING PACKAGES

ORDER N° : TP03 05 05
TEST DATE : November 2008, January 2009
TEST LOCATION : CETIAT - 25 Avenue des Arts - 69100 Villeurbanne

MANUFACTURER : DAIKIN EUROPE NV
EQUIPMENT ID : ERHQ11AA + EKHBX
REFERENCE DOCUMENTS : Eurovent Standard 6/C/003-2006
EN 14511
ISO 3741 / ISO 9614

TEST OPERATOR(S) : Julien GARCIA et Lionel BOITEUX

Version	Date	Nature of change	Modified pages
00	January 12 th 2008	First distributed	

Each new version cancels and replaces the previous one.

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1. SUMMARY TEST RESULTS

Test device : DAIKIN EUROPE NV, ERHQ11AA + EKHBX

Test operators :
Julien GARCIA

Cooling mode	Unit	MP1 - Standard		MP2 - Application		MP3 - Standard	
		Rated	Measured	Rated	Measured	Rated	Measured
Cooling capacity	kW	13.90	14.30	13.78	14.88	10.00	10.32
	Deviation	2.9%		8.0%		3.2%	
EER		3.67	4.01	4.37	4.85	2.78	3.04
Cooling capacity / Power imput	Deviation	9.4%		11.1%		9.5%	
Available pressure	kPa	55.9	45.6	55.9	43.1	55.9	60.6
Indoor Unit	Deviation	-18.4%		-22.9%		8.4%	
Sound power level (Intdoor unit)	dB (A)	-	48.5				
		-					
Sound power level (Outdoor unit)	dB (A)	64.0	63.2				
		-0.8					

Heating mode	Unit	MP1 - Standard		MP2 - Standard		MP3 - VIVRELEC	
		Rated	Measured	Rated	Measured	Rated	Measured
Heating capacity	kW	11.20	11.23	10.30	10.44		
	Deviation	0.3%		1.4%			
COP		4.55	4.73	3.37	3.56		
Heating capacity / Power imput	Deviation	4.0%		5.7%			
Available pressure	kPa	52.5	57.9	52.5	60.4		
Indoor side	Deviation	10.3%		15.0%			

Part load mode, ESEER

Rating conditions for air cooled chillers	100% (35°C)		75% (30°C)	
	Rated	Measured	Rated	Measured
EER Cooling capacity / Power imput	2.78	3.04	3.6525822	3.57
Deviation	9.5%		-2.2%	
Rating conditions for air cooled chillers	100% (25°C)		75% (20°C)	
	Rated	Measured	Rated	Measured
EER Cooling capacity / Power imput				
Deviation				

2. TESTING OBJECT

		Specification	Verification
Manufacturer		DAIKIN EUROPE	DAIKIN EUROPE
Designation		ERHQ11AA +EKHBX	ERHQ11AA +EKHBX
Serial number		-	
Date of manufacture		nov-07	
Overall dimensions (mm * mm * mm)		900*320*1170	
Weight during transport (kg)		114 kg	
Refrigerant (on plate)	Type	R410A	R410A
	Charge (kg)	3.7 kg	3.7 kg
Compressor	Number	1	1
	Manufacturer	DAIKIN	DAIKIN
	Type	Scroll	Scroll
	Serial number	JT100G-VD@T3	JT100G-VD@T3
Expansion device	Type	Electronic	Electronic
	Manufacturer	Saginomiya Seisakusho	-
	Model	-	-
Evaporator (indoor)	Manufacturer Designation	Alfa Laval	-
	Type / Number	Brased plate / Alfa LAVAL C305	Brased plate / 1
	Inlet Connection Diameter	1"MBSP	1"1/4
	Outlet Connection Diameter	1"MBSP	1"1/4
	Pump included / setting	yes / 1	yes / max
Condenser (Outdoor heat exchanger) Water cooled	Manufacturer Designation		
	Type / Number		
	Inlet Connection Diameter		
	Outlet Connection Diameter		
	Pump included / setting		
Condenser (Outdoor heat exchanger) Air cooled	Manufacturer Designation	DAIKIN EUROPE	-
	Frontal area (m^2)	-	0.98
	Fins spacing / Type	/ 1.4	1.6 mm / flat
	Fan number / Type	2/ Propeller	2 / helicoïdaux
	RPM	800	-
	Fan diameter	470	475 mm
	Fan motor : manufacturer / reference	Shibaura / 27R1103	-

3. MEASURING INSTRUMENTS

Measured variable			Measuring instruments
Indoor	Inlet temperature	Number	TEE1
		Type / Ref	pt100 200 mm / 994756
	Outlet temperature	Number	TES1
		Type / Ref	pt100 200 mm / 994757
	Volume flow rate	Type / Ref	electromagnetic / 5863
	Pressure drop	Type / Ref	capteur à membrane / 8991
Outdoor Water cooled	Inlet temperature	Number	
		Type / Ref	
	Outlet temperature	Number	
		Type / Ref	
	Volume flow rate	Type / Ref	
	Pressure drop	Type / Ref	
Outdoor Air cooled	Inlet DB temperature	Number	TSE1àTSE2, TSE4àTSE7, TSE9àTSE10
		Type / Ref	PT100 300 mm/ 994731à994732, 994734à994737, 994739à994740
	Intlet WB temperature	Number	Hygo 1
		Type / Ref	à point de rosée / 8961
	Volume flow rate	Type / Ref	-
	ESP (if ducted)	Type / Ref	-
	Fan rotation speed	Type / Ref	stroboscope tachometer / 9152
Data recorder		Type / Ref	HP3852A
Electrical quantities	Voltage	Type / Ref	MICAR
	Current	Type / Ref	MICAR
	Power supply	Type / Ref	MICAR
Acoustical quantities Intensity method	Analyser	Type / Ref	
	Probe	Number	
	Calibrator	Type / Ref	
Acoustical quantities Reverberation room method	Analyser	Type / Ref	
	Microphones	Number	
	RSS (Reference Sound Source	Type / Ref	
	Calibrator	Type / Ref	

4. UNCERTAINTY OF MEASUREMENT

The different uncertainty of measurement are in accordance with the following table.

Measured variable		Unit	Uncertainty of measurment
Liquide	Inlet / oulet temperature	°C	± 0.1 K
	Volume flow rate	m³/h	± 1 %
	Pressure drop / Available pressure	Pa	± 0.1 kPa
Air	DB temperature	°C	± 0.2 K
	WB temperature	°C	± 0.3 K
	Volume flow rate	m³/h	± 5 %
	ESP	Pa	± 5 Pa (Dp < 100 Pa)
			± 5 % (Dp > 100 Pa)
Refrigerant	Discharge pressure	bar rel.	± 1 %
	Temperature	°C	± 0.5 K
Concentration	Brine	%	± 2 %
Electrical quantities	Total power supply	W	± 1 %
	Voltage	V	± 0.5 %
	Current	A	± 0.5 %

5. THERMAL TEST RESULTS - COOLING MODE

Test device : DAIKIN EUROPE NV, ERHQ11AA + EKHBX

		MP1 - Standard		MP2 - Application		MP3 - Standard	
	Unit	Rated	Measured	Rated	Measured	Rated	Measured
Electrical measures							
Voltage	V	230	230.7	230	232.5	230	231.2
Current	A	-	16.4	-	14.2	-	15.5
Frequency	Hz	-	50	-	50	-	50
Pump Power input	kW	-	0.190	-	0.191	-	0.180
Power input	kW	3.79	3.56	3.15	3.07	3.60	3.39
	Deviation	-6.0%		-2.7%		-5.9%	
Indoor - Evaporator (Water)							
Inlet temperature	°C	23.0	23.0	20.0	20.0	12.0	12.0
Outlet temperature	°C	18.0	18.0	15.0	15.0	7.0	7.0
Mass flow rate	kg/s	-	0.684	-	0.710	-	0.494
Volume flow rate	m3/h	-	2.47	-	2.56	-	1.78
Heat capacity difference	kJ/kg	-	20.9	-	21.0	-	20.9
Available pressure	kPa	55.90	45.60	55.90	43.10	55.90	60.60
	Deviation	-18.4%		-22.9%		8.4%	
Cooling capacity	kW	13.90	14.30	13.78	14.88	10.00	10.32
	Deviation	2.9%		8.0%		3.2%	
EER		3.67	4.01	4.37	4.85	2.78	3.04
Cooling capacity / Power imput	Deviation	9.4%		11.1%		9.5%	
Outdoor - Condenseur (Air)							
Air inlet dry bulb temperature	°C	35.0	35.0	28.0	28.0	35.0	35.1
Rotation speed of fan(s)	rpm	-	803/803	-	803/803	-	803/803

Atmospheric pressure	mbar	-	992	-	1 005	-	994

6. THERMAL TEST RESULTS - HEATING MODE

Test device : DAIKIN EUROPE NV, ERHQ11AA + EKHBX

		MP1 - Standard		MP2 - Standard		MP3 - VIVRELEC	
	Unit	Rated	Measured	Rated	Measured	Rated	Measured
Electrical measures							
Voltage	V	230	232.9	230	233.9		
Current	A	-	10.9	-	13.3		
Frequency	Hz	-	50	-	50		
Pump Power input	kW	-	0.182	-	0.182		
Power input	kW	2.46	2.37	3.06	2.93		
	Deviation	-3.5%		-4.2%			
Indoor -Condenser (Water)							
Inlet temperature	°C	30.0	30.0	40.0	39.9		
Outlet temperature	°C	35.0	35.1	45.0	45.0		
Mass flow rate	kg/s	-	0.535	-	0.496		
Volume flow rate	m3/h	-	1.93	-	1.80		
Heat capacity difference	kJ/kg	-	21.0	-	21.1		
Available pressure	kPa	52.50	57.90	52.50	60.40		
	Deviation	10.3%		15.0%			
Heating capacity	kW	11.20	11.23	10.30	10.44		
	Deviation	0.3%		1.4%			
COP		4.55	4.73	3.37	3.56		
Heating capacity / Power input	Deviation	4.0%		5.7%			
Outdoor - Evaporator (Air)							
Air inlet dry bulb temperature	°C	7.0	7.0	7.0	7.1		
Air inlet dew point temperature	°C	-	5.1	-	5.1		
Air inlet wet bulb temperature	°C	6.0	6.0	6.0	6.1		
Rotation speed of fan(s)	rpm	-	762/763	-	763/762		
Atmospheric pressure	mbar	-	976	-	983		

7. THERMAL TEST RESULTS - PART LOAD MODE

Test device : DAIKIN EUROPE NV, ERHQ11AA + EKHBX

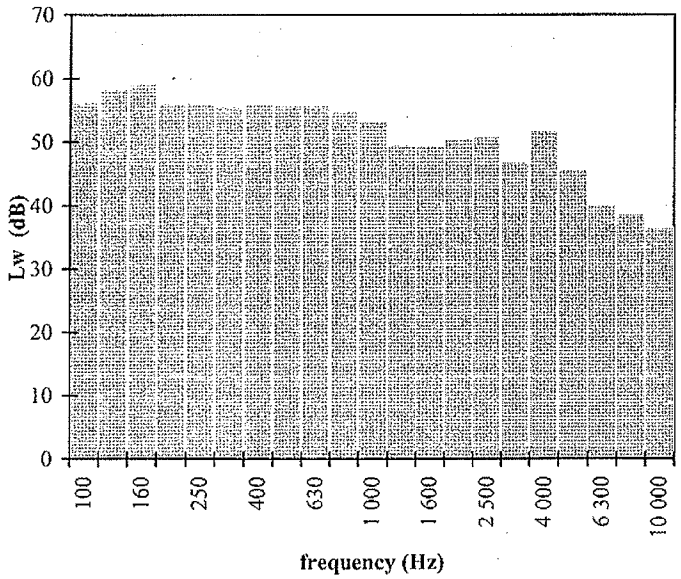
		75%		50%		25%	
	Unit	Rated	Measured	Rated	Measured	Rated	Measured
Electrical measures							
Voltage	V	230	232.0				
Current	A	-	14.5				
Frequency	Hz	-	50				
Pump Power input	kW	-	0.180				
Power input	kW	2.13	3.14				
	Deviation	47.4%					
Indoor - Evaporator (Water)							
Inlet temperature	°C	*	12.4				
Outlet temperature	°C	7.0	7.0				
Mass flow rate	kg/s	-	0.493				
Volume flow rate	m3/h	-	1.78				
Heat capacity difference	kJ/(kg.K)	-	22.7				
Available pressure	kPa	55.90	60.60				
	Deviation	8.4%					
Cooling capacity	kW	7.78	11.22				
	Deviation	44.2%					
EER		3.65	3.57				
Cooling capacity / Power imput	Deviation	-2.2%					
Outdoor - Condenseur (Air)							
Air inlet dry bulb temperature	°C	30.0	30.1				
Rotation speed of fan(s)	rpm	-	803/803	-		-	
Atmospheric pressure	mbar	-	1 004	-		-	

8. ACOUSTICAL TEST RESULTS - Outdoor unit

Test device : DAIKIN EUROPE NV, ERHQ11AA + EKHBX

Method of measurement : Double reverberant room

frequency (Hz)	Lw dB	Lw dB(A)
100	56.3	37.2
125	58.4	42.3
160	59.2	45.8
200	56.1	45.2
250	56.1	47.5
315	55.7	49.1
400	56.0	51.2
500	55.7	52.5
630	55.8	53.9
800	54.8	54.0
1 000	53.1	53.1
1 250	49.6	50.2
1 600	49.3	50.3
2 000	50.6	51.8
2 500	50.9	52.2
3 150	46.9	48.1
4 000	51.8	52.8
5 000	45.7	46.2
6 300	40.1	40.0
8 000	38.7	37.6
10 000	36.6	34.1



Overall sound power level	**67.4**	**63.2**

Test conditions on the tested unit

Voltage		V	230
Indoor side conditions	Inlet temperature	°C	23.0
	Outlet temperature	°C	18.1
Outdoor side conditions (Air)	Dry bulb temperature	°C	34.9
	Atmospheric pressure	Pa	100 280
	Rotation speed	rpm	803/803

Environmental measurement

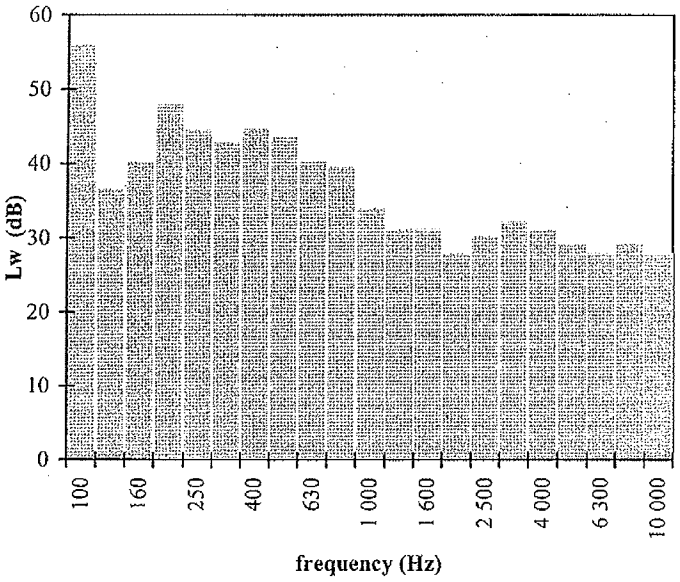
Reverberation room method	Number of measurement point (/rotating arm)	6
	Volume of the room	233

9. ACOUSTICAL TEST RESULTS - Indoor unit

Test device : DAIKIN EUROPE NV, ERHQ11AA + EKHBX

Method of measurement : Double reverberant room

frequency (Hz)	Lw dB	Lw dB(A)
100	56.2	37.1
125	36.8	20.7
160	40.4	27.0
200	48.2	37.3
250	44.7	36.1
315	43.0	36.4
400	44.8	40.0
500	43.8	40.6
630	40.6	38.7
800	39.7	38.9
1 000	34.2	34.2
1 250	31.3	31.9
1 600	31.5	32.5
2 000	28.0	29.2
2 500	30.4	31.7
3 150	32.3	33.5
4 000	31.3	32.3
5 000	29.3	29.8
6 300	28.2	28.1
8 000	29.5	28.4
10 000	27.8	25.3



Overall sound power level	**58.0**	**48.5**

Test conditions on the tested unit

Voltage		V	230
Indoor side conditions	Inlet temperature	°C	23.0
	Outlet temperature	°C	18.1
Outdoor side conditions (Air)	Dry bulb temperature	°C	34.9
	Atmospheric pressure	Pa	100 280
	Rotation speed	rpm	803/803

Environmental measurement

Reverberation room method	Number of measurement point (/rotating arm)	18
	Volume of the room	205

10. LABORATORY REMARKS

Sleep power : 19 W

S SCHWEIZERISCHER PRÜFSTELLENDIENST
T SERVICE SUISSE D'ESSAI
S SERVIZIO DI PROVA IN SVIZZERA
S SWISS TESTING SERVICE

WPZ
Wärmepumpen-Testzentrum

Von der Schweizerischen Akkreditierungsstelle akkreditierte Prüfstelle
Laboratoire d'essai accrédité par le Service d'Accréditation Suisse
Testing Laboratory accredited by the Swiss Accreditation Service

Akkreditierungs-Nr.
No. d'accréditation STS 499
Accreditation No.

The Swiss Testing Service is one of the signatories to the EAL Multilateral Agreement for the recognition of test certificates

Prüfnummer
No. d'essai LW-124-08-05
Test No.

Prüfzertifikat
Certificat d'essai
Test certificate

Auftraggeber Client Customer	Daikin Europe NV Zandvoordestraat 300 BE - 8400 Oostende	Datum der Prüfung Date du test Date of test	21.07.08 - 26.09.08
Gerät Type Type	ERHQ014AAW1 (Ausseneinheit) EKHBX016AB3V3 (Inneneinheit)	Bauart Type de construction Type of construction	Splitwärmepumpe Pompe à chaleur splitée split heat pump
Kältemittel Réfrigérant Refrigerant	R410 A	Kältemittelfüllmenge Quantité de réfrigérant Capacity of refrigerant	2.95 kg

Prüfung wurde gemäss den folgenden Normen durchgeführt Mesures exécutées conformément aux normes Measurements regarding the following standards	EN 14511 EHPA / DACH-Prüfreglement (vollständig / complètement / complete) EN ISO 9614-2

Dieses Prüfzertifikat darf ohne schriftliche Zustimmung der Prüfstelle nicht auszugsweise vervielfältigt werden.
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Messresultate und Messunsicherheiten sind auf der folgenden Seite aufgeführt und sind Teil des Zertifikates.
Les résultats et les incertitudes de mesure sont donnés aux page suivante et font partie du certificat.
This measurements, the uncertainties are given on the following page and are part of the certificate.

Stempel und Datum
Timbre et date
Stamp and date
WPZ
Wärmepumpen-Testzentrum
Hochschule f. Technik NTB
Werdenbergstrasse 4
CH – 9471 Buchs SG
30.09.2008

Messort
Site de mesure
Measuring site
Wärmepumpen-Testzentrum

Prüfer
Contrôleur
Supervisor
M. Uhlmann
M. Uhlmann, dipl. Ing. FH

Prüfstellenleiter
Chef du Laboratoire
Head of the Laboratory
M. Nani, dipl. Ing. HTL

Leistungen / Performances / Performances

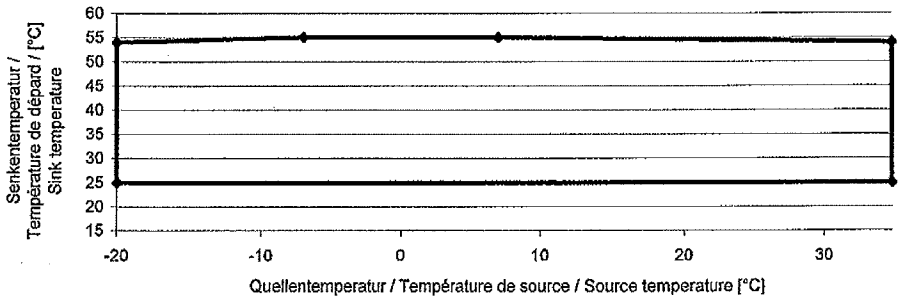
Prüfbedingungen / Conditions d'essai / Test conditions	*/**/***	A7 / W35 (89% r.H.)	A2 / W35 (84% r.H.)	A2 / W35-25 (84% r.H.)	A-7 / W35 (75% r.H.)	A-15 / W35 (-% r.H.)	A7 / W45 (89% r.H.)	A2 / W45 (84% r.H.)	A-7 / W45 (75% r.H.)	A-15 / W45 (-% r.H.)	A20 / W54 (50% r.H.)	A7 / W55 (89% r.H.)	A-7 / W55 (75% r.H.)
Heizleistung / Puissance chauffage moy. / Heating power	kW	14.90	10.35	9.88	8.79	7.18	13.98	9.92	8.99	6.80	15.74	11.36	6.70
Elektrische Leistung / Puissance électrique moy. / Electrical power	kW	3.29	3.04	2.65	3.22	3.29	4.01	3.77	3.98	3.79	4.75	4.41	4.40
COP	-	4.53	3.4	3.73	2.73	2.18	3.49	2.63	2.26	1.79	3.32	2.58	1.52

A7 / W35: COP ±2.35%; cosφ = 0.96 A2 / W35: COP ± 3.16%; cosφ = 0.93

Einsatzgrenzen / Limites d'utilisation / Warranted usage limits

Temperaturbedingungen
Conditions du température
Temperature conditions

A-20 / W25
A-20 / W54
A-7 / W55
A7 / W55
A35 / W54
A35 / W25



Sicherheitsprüfung	bestanden
Test de sécurité	essai passé avec succès
Safety test	passed

Schallleistungspegel / Niveau de puissance acoustique / Sound power level

Ansaugöffnung / Ouverture d'aspiration / Suction opening			Ausblasöffnung / Ouverture d'expulsion / Discharge opening			Aussenmessung / Mesure extérieure / Outdoor measurement		
	dB(A)	-		dB(A)	-		dB(A)	64.4
Messunsicherheit / Ecart type / Standard deviation	dB	-		dB	-		dB	±1.5

Elektrische Messung / Mesures électriques / Electrical Measurement

max. Anlaufstrom / Courant démarrage max. / max. starting current			max. Anlaufstrom / Courant démarrage max. / max. starting current			max. Anlaufstrom / Courant démarrage max. / max. starting current		
	L_{1eff} [A]	7.5 ****		L_{2eff} [A]	6.7 ****		L_{3eff} [A]	7.0 ****

Bemerkung / Remarque / Comment

*Prüfpunkte mit Vorlauftemperaturen bis 45°C wurden bei einer Frequenz von 70 Hz (nach FU) gemessen.

**Prüfpunkte mit Vorlauftemperaturen von 54°C und 55°C wurden bei einer Frequenz von 66 Hz (nach FU) gemessen.

***Bei Quellentemperaturen ab 20°C konnten Vorlauftemperaturen von 55°C nicht erreicht werden.

****Es wird der max. Betriebsstrom (bei der Einsatzgrenze A-20/W35) angegeben, da aufgrund des Sanftstarts mit dem FU keine Stromspitze erfasst werden kann.

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Prüfpunkt A7/ W35_f = 70 Hz

Prüfnummer: LW-124-08-05

Messgrössen	Einheit	Mittelwert	abs. Fehler	rel. Fehler
1. Thermodynamische Grössen				
a) Thermische Leistung				
mittlere Heizleistung	W	**14900**	± 316	± 2.12%
b) Verdampfer				
Eintrittstemperatur	°C	6.97	± 0.15	
Relative Luftfeuchtigkeit beim Eintritt	%	89.4	± 0.9	
c) Kondensator				
Rücklauftemperatur	°C	29.95	± 0.15	
Vorlauftemperatur	°C	34.83	± 0.16	
Volumenstrom	m^3h^{-1}	2.64	± 0.02	
interne statische Druckdifferenz	mbar	300.9	± 1.5	
d) Abtaubetrieb				
Dauer des Abauvorganges	min	1.2		
Dauer des Arbeitszyklus ohne Abtauzeit	min	120.2		
Relative Abtaudauer	%	1.0		
Leistung der Heizanlage entnommen	W	**-2564**		
2. Elektrische und weitere Messgrössen				
Wirkleistung	W	3217	± 33	
Wirkleistung total (inkl. Umwälzpumpenleistung)	W	**3291**	± 33	± 1.02%
Spannung	V	232.6	± 1.1	
mittlere Stromaufnahme	A	4.79	± 0.08	
Scheinleistung	VA	3339	± 31	
Leistungsfaktor cosφ	-	0.963	± 0.004	
Niederdruck	bara	8.0	± 0.1	
Sauggastemperatur	°C		±	
Hochdruck	bara	23.8	± 0.3	
Flüssigkeitstemperatur	°C		±	
3. Leistungszahl				
COP	-	**4.53**	± 0.11	± 2.35%
4. Umgebungsbedingung				
Lufttemperatur	°C	24	± 2	
5. Prüfzeit				
Prüfbeginn	hh:mm:ss	21.07.2008	22:05:24	
Prüfende	hh:mm:ss	22.07.2008	00:06:54	
Prüfdauer	hh:mm:ss		02:01:30	
6. Prüfer: um **Michael Uhlmann**				

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Prüfpunkt A2/ W35_f = 70 Hz

Prüfnummer: LW-124-08-05

Messgrössen	Einheit	Mittelwert	abs. Fehler	rel. Fehler
1. Thermodynamische Grössen				
a) Thermische Leistung				
mittlere Heizleistung	W	**10346**	± 308	± 2.98%
b) Verdampfer				
Eintrittstemperatur	°C	2.22	± 0.15	
Relative Luftfeuchtigkeit beim Eintritt	%	84.8	± 0.8	
c) Kondensator				
Rücklauftemperatur	°C	30.42	± 0.15	
Vorlauftemperatur	°C	33.84	± 0.16	
Volumenstrom	m^3h^{-1}	2.62	± 0.01	
interne statische Druckdifferenz	mbar	300.0	± 1.5	
d) Abtaubetrieb				
Dauer des Abauvorganges	min	16.0		
Dauer des Arbeitszyklus ohne Abtauzeit	min	153.8		
Relative Abtaudauer	%	9.4		
Leistung der Heizanlage entnommen	W	**-4069**		
2. Elektrische und weitere Messgrössen				
Wirkleistung	W	2969	± 32	
Wirkleistung total (inkl. Umwälzpumpenleistung)	W	**3041**	± 32	± 1.05%
Spannung	V	231.5	± 1.1	
mittlere Stromaufnahme	A	4.59	± 0.08	
Scheinleistung	VA	3188	± 29	
Leistungsfaktor cosφ	-	0.931	± 0.004	
Niederdruck	bara	6.8	± 0.1	
Sauggastemperatur	°C		±	
Hochdruck	bara	23.7	± 0.3	
Flüssigkeitstemperatur	°C		±	
3. Leistungszahl				
COP	-	**3.40**	± 0.11	± 3.16%
4. Umgebungsbedingung				
Lufttemperatur	°C	24	± 2	
5. Prüfzeit				
Prüfbeginn	hh:mm:ss	22.07.2008	12:28:15	
Prüfende	hh:mm:ss	22.07.2008	15:20:45	
Prüfdauer	hh:mm:ss		02:52:30	
6. Prüfer: um **Michael Uhlmann**				

Von der Schweizerischen Akkreditierungsstelle akkreditierte Prüfstelle
Laboratoire d'essai accrédité par le Service d'Accréditation Suisse
Testing Laboratory accredited by the Swiss Accreditation Service

Akkreditierungs-Nr.
No. d'accréditation STS 499
Accreditation No.

The Swiss Testing Service is one of the signatories to the EAL
Multilateral Agreement for the recognition of test certificates

Prüfnummer
No. d'essai LW-124-08-05
Test No.

Prüfzertifikat
Certificat d'essai
Test certificate

Auftraggeber Client Customer	Daikin Europe NV Zandvoordestraat 300 BE - 8400 Oostende	Datum der Prüfung Date du test Date of test	26.09.2008
Gerät Type Type	ERHQ014AAW1 (Ausseneinheit)	Messobjekt Objet de mesure Measuring object	Aussenmessung Mesure extérieure Outdoor measurement
Prüfbedingung Condition d'essai Test condition	A15 / W45 (r.H. 65%)	Genauigkeitsklasse Precision classe Accuracy class	2
Schallleistungspegel Niveau de puissance acoustique dB(A) Sound power level	64.4	Messunsicherheit Ecart type Standard deviation	dB ± 1.5

Messung wurde gemäss der folgenden Norm durchgeführt
Mesures exécutées conformément aux normes EN ISO 9614-2
Measurement regarding the following standard

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Stempel und Datum
Timbre et date
Stamp and date

WPZ
Wärmepumpen-Testzentrum
Hochschule f. Technik NTB
Werdenbergstrasse 4
CH – 9471 Buchs SG

29.09.2008

Prüfer
Contrôleur
Supervisor

M. Eschmann, dipl. Ing. FH

Messort
Site de mesure
Measuring site

Wärmepumpen-Testzentrum

Verwendete Messgeräte / Employer d'appareillage de mesure / Measuring instruments in use

Bezeichnung / Description / Description	Gerät / Type / Type	Seriennr. / No. de Série / Serial no.
Real Time Analyzer	01 dB-Metravib	#1912
	PCMCIA-Card	#0001912
Auswertesoftware	dBFA	Version 4.7.01
Utilisation de software	Excel-Sheet	Version 1.0/me
Analysis software		
Intensitätssonde	G.R.A.S Typ 50AI-B	38213
Sonde de intensité		
Intensity sonde		
Mikrofonpaar	Typ 40 AK	49855
Couple de microphone		49876
Couple of microphone		
Vorverstärker	Typ 26AA	48806
Amplificateur d'entrée		48807
Pre-amplifier		
Zuordnung	Kanal A - Vorverstärker 48806 - Mikrofon 49855	
	Kanal B - Vorverstärker 48807 - Mikrofon 49876	
Attribution	Canal A - Amplificateur d'entrée 48806 - Microphone 49855	
	Canal B - Amplificateur d'entrée 48807 - Microphone 49876	
Attribution	Chanal A - Pre-amplifier 48806 - Microphone 49855	
	Chanal B - Pre-amplifier 48807 - Microphone 49876	
Zubehör	Windschirm (Ellipsoid)	-
Accessoire	Abat-vent (ellipsoïde)	-
Accessory	Wind deflector (ellipsoid)	-
Kabel 5 m	AC0002	-
Câble 5 m		
Cable 5m		
Schallintensitätskalibrator	G.R.A.S Typ 51AB	49049
Calibratore d'intensité acoustique		
Sound intensity calibrator		
Akustischer Kalibrator Klasse 1	Nor1251	29926
Calibratore acoustique classe 1		
Acoustic calibrator class 1		

Letzte Eichung / Dernier étalonnage / Latest adjustment

Norsonic 01dB-Metravib	25.06.2007	Norsonic Brechbühl AG, Grünenmatt
G.R.A.S Typ 50 AI-B	25.06.2007	
G.R.A.S Typ 51AB	25.06.2007	
Nor1251	25.06.2007	

Messresultate mit Genauigkeitsklasse 2 / Résultat de mesure avec precision classe 2 / Measurement result with accuracy class 2

Third band	L_W	Criteria 1			Criteria 2		Criteria 3	All criterias	$L_{W,A}$	
[dB]	[dB]	F_{pi}	L_d	$L_d > F_{pi}$	F+/-	F+/- <= 3	$\|L_{Wi}(1)-L_{Wi}(2)\| \le s$	passed?	[dB(A)]	
50	69.6	NEGATIV	7.2	OK	0.2	OK	OK	yes	39.4	w
63	70.7	3.3	7.3	OK	0.9	OK	OK	yes	44.5	u
80	68.5	4.3	9.3	OK	3.6	-	OK	no	46	u
100	54.9	5.7	11.3	OK	2.8	OK	OK	yes	35.8	u
125	59.9	3.2	12.9	OK	1.4	OK	OK	yes	43.8	u
160	59.8	4.4	13.5	OK	0.1	OK	OK	yes	46.4	u
200	58.1	5.1	13.6	OK	0.4	OK	OK	yes	47.2	u
250	58.8	4.3	13.6	OK	0	OK	OK	yes	50.2	u
315	59.6	5.4	13.6	OK	0	OK	OK	yes	53	u
400	58.3	4.6	13.6	OK	0	OK	OK	yes	53.5	u
500	59.1	4.2	13.6	OK	0	OK	OK	yes	55.9	<<< passed
630	57.3	4.6	13.6	OK	0	OK	OK	yes	55.4	<<< passed
800	56.3	5	13.6	OK	0	OK	OK	yes	55.5	<<< passed
1k	55.1	5.2	13.6	OK	0	OK	OK	yes	55.1	<<< passed
1.25k	51.5	5	13.6	OK	0	OK	OK	yes	52.1	u
1.6k	50.7	5.2	13.6	OK	0	OK	OK	yes	51.7	u
2k	49.9	5.5	13.6	OK	0	OK	OK	yes	51.1	u
2.5k	49	5.8	13.6	OK	0	OK	OK	yes	50.3	u
3.15k	44.6	5.8	13.6	OK	0	OK	OK	yes	45.8	u
4k	41.7	6.1	13.6	OK	0	OK	OK	yes	42.7	u
5k	42.3	5.8	13.6	OK	0	OK	OK	yes	42.8	w
6.3k	40	6.1	13.6	OK	0.2	OK	OK	yes	39.9	w
$L_{W,A}$									**64.4**	

Legende / Legend

<<< passed — Terzbänder mit dieser Bezeichnung sind für die Genauigkeit des A-bewerteten Gesamtschallleistungspegel $L_{W,A}$ massgebend.
Mit "<<< passed" ist die geforderte Genauigkeitsklasse erfüllt.
Third bands with this description are significant for accuracy of A-weighted total sound power level $L_{W,A}$.
Required accuracy class is passed with "<<< passed".

<<< no passed — Terzbänder mit dieser Bezeichnung sind für die Genauigkeit des A-bewerteten Gesamtschallleistungspegel $L_{W,A}$ massgebend.
Mit "<<< no passed" ist die geforderte Genauigkeitsklasse nicht erfüllt.
Third bands with this description are significant for accuracy of A-weighted total sound power level $L_{W,A}$.
Required accuracy class isn't passed with "<<< no passed".

u — Terzbänder mit dieser Bezeichnung sind für die Genauigkeit des A-bewerteten Gesamtschallleistungspegel $L_{W,A}$ unbedeutend, werden aber bei der Berechnung des $L_{W,A}$ berücksichtigt.
Third bands with this description aren't significant for accuracy of A-weighted total sound power level $L_{W,A}$, but shall be regarded on Calculation of $L_{W,A}$.

s and w — Terzbänder mit dieser Bezeichung werden bei der Berechnung des $L_{W,A}$ nicht berücksichtigt.
Third bands with this description shall not be regarded on Calculation of $L_{W,A}$.

Messresultate mit Genauigkeitsklasse 3 / Résultat de mesure avec precision classe 3 / Measurement result with accuracy class 3

Third band	L_W	Criteria 1			Criteria 2		Criteria 3	All criterias	$L_{W,A}$	
[dB]	[dB]	F_{pi}	L_d	$L_d > F_{pi}$	F+/-	F+/- <= 3	$\lvert L_{Wi}(1)-L_{Wi}(2)\rvert \leq s$	passed?	[dB(A)]	
50	69.6	NEGATIV	10.2	OK	0.2	OK	OK	yes	39.4	w
63	70.7	3.3	10.3	OK	0.9	OK	OK	yes	44.5	u
80	68.5	4.3	12.3	OK	3.6	-	OK	no	46	u
100	54.9	5.7	14.3	OK	2.8	OK	OK	yes	35.8	u
125	59.9	3.2	15.9	OK	1.4	OK	OK	yes	43.8	u
160	59.8	4.4	16.5	OK	0.1	OK	OK	yes	46.4	u
200	58.1	5.1	16.6	OK	0.4	OK	OK	yes	47.2	u
250	58.8	4.3	16.6	OK	0	OK	OK	yes	50.2	u
315	59.6	5.4	16.6	OK	0	OK	OK	yes	53	u
400	58.3	4.6	16.6	OK	0	OK	OK	yes	53.5	u
500	59.1	4.2	16.6	OK	0	OK	OK	yes	55.9	<<< passed
630	57.3	4.6	16.6	OK	0	OK	OK	yes	55.4	<<< passed
800	56.3	5	16.6	OK	0	OK	OK	yes	55.5	<<< passed
1k	55.1	5.2	16.6	OK	0	OK	OK	yes	55.1	<<< passed
1.25k	51.5	5	16.6	OK	0	OK	OK	yes	52.1	u
1.6k	50.7	5.2	16.6	OK	0	OK	OK	yes	51.7	u
2k	49.9	5.5	16.6	OK	0	OK	OK	yes	51.1	u
2.5k	49	5.8	16.6	OK	0	OK	OK	yes	50.3	u
3.15k	44.6	5.8	16.6	OK	0	OK	OK	yes	45.8	u
4k	41.7	6.1	16.6	OK	0	OK	OK	yes	42.7	u
5k	42.3	5.8	16.6	OK	0	OK	OK	yes	42.8	w
6.3k	40	6.1	16.6	OK	0.2	OK	OK	yes	39.9	w
$L_{W,A}$									64.4	

Legende / Legend

<<< passed

Terzbänder mit dieser Bezeichnung sind für die Genauigkeit des A-bewerteten Gesamtschallleistungspegel $L_{W,A}$ massgebend.
Mit "<<< passed" ist die geforderte Genauigkeitsklasse erfüllt.
Third bands with this description are significant for accuracy of A-weighted total sound power level $L_{W,A}$.
Required accuracy class is passed with "<<< passed".

<<< no passed

Terzbänder mit dieser Bezeichnung sind für die Genauigkeit des A-bewerteten Gesamtschallleistungspegel $L_{W,A}$ massgebend.
Mit "<<< no passed" ist die geforderte Genauigkeitsklasse nicht erfüllt.
Third bands with this description are significant for accuracy of A-weighted total sound power level $L_{W,A}$.
Required accuracy class isn't passed with "<<< no passed".

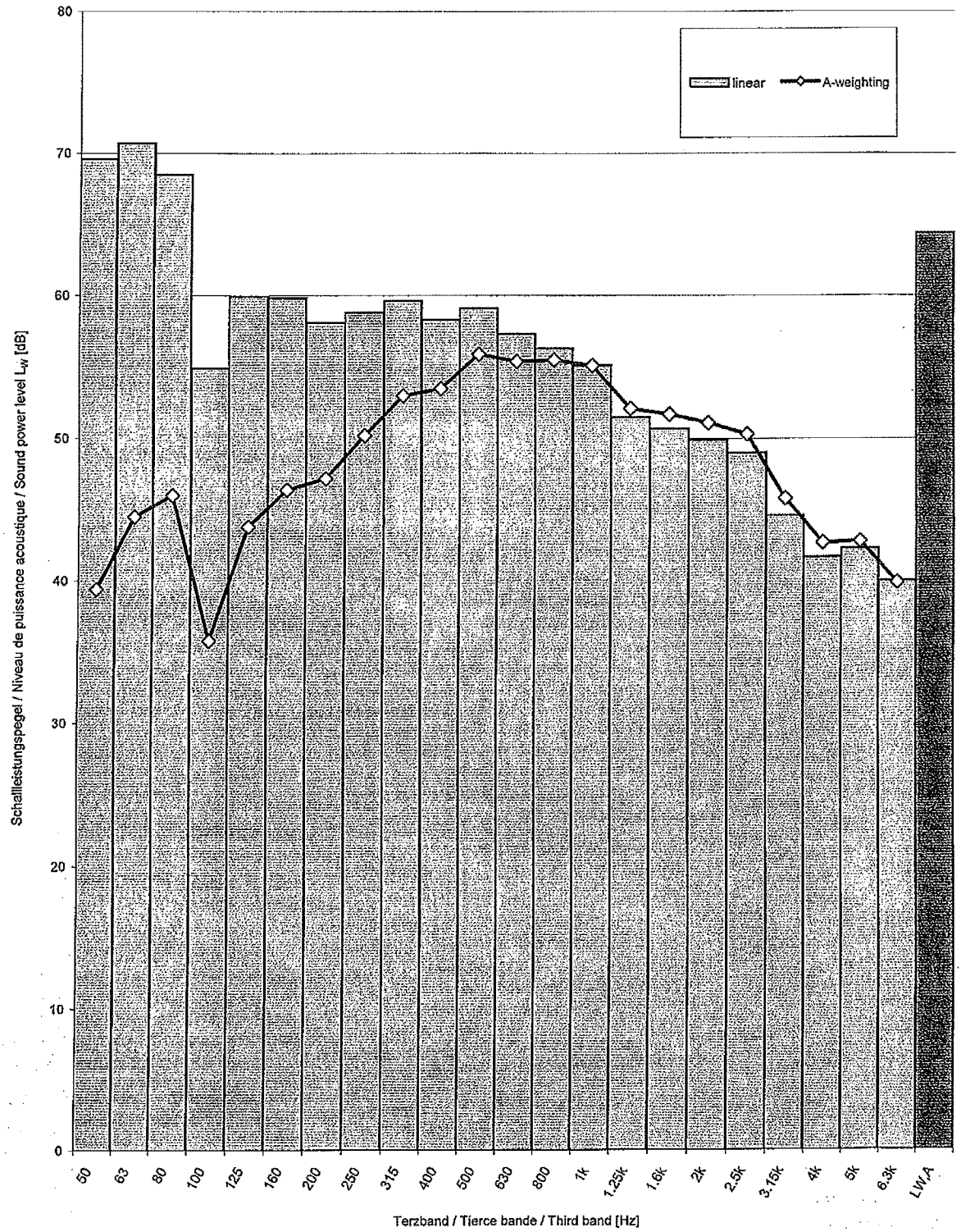
u

Terzbänder mit dieser Bezeichnung sind für die Genauigkeit des A-bewerteten Gesamtschallleistungspegel $L_{W,A}$ unbedeutend, werden aber bei der Berechnung des $L_{W,A}$ berücksichtigt.
Third bands with this description aren't significant for accuracy of A-weighted total sound power level $L_{W,A}$, but shall be regarded on Calculation of $L_{W,A}$.

s and w

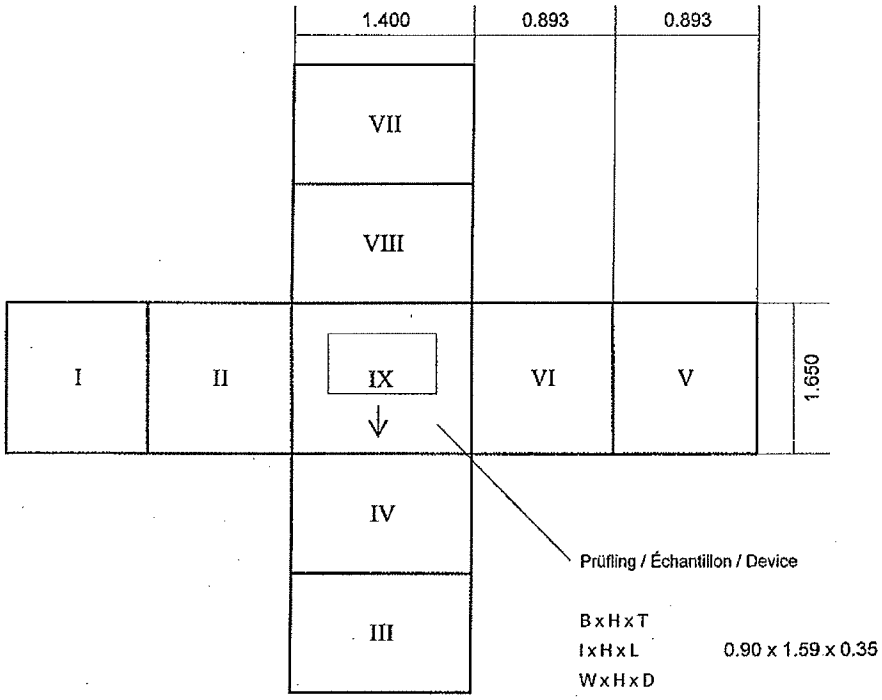
Terzbänder mit dieser Bezeichung werden bei der Berechnung des $L_{W,A}$ nicht berücksichtigt.
Third bands with this description shall not be regarded on Calculation of $L_{W,A}$.

Spektrum Schallleistungspegel / Niveau de puissance acoustique du spectre /
Spectrum Sound power level L_W



Hüllfläche / Face de mesure / Measurement surface

Abstand zur Hüllfläche
Distance à la face de mesure min 0.2
Distance to measurement surface



Segmente / Segments / Segments

I	S=	1.393 m²	(ohne Schlauchfläche (Hydraulik) / sans la surface du canal (hydraulique) / without tube surface (hydraulic))
II, V, VI	S=	1.473 m²	
III, IV, VII, VIII	S=	1.250 m²	
IX	S=	2.310 m²	

Gesamte Hüllfläche
Surface de mesure totale 13.119 m²
Total measurement surface

Alle Angaben in Meter
Toutes les indications en mètres
All dimensions are given in meters