

Prüfbericht-Nr.: <i>Test report no.:</i>	CN2559MN 001	Auftrags-Nr.: <i>Order no.:</i>	326055060	Seite 1 von 13 <i>Page 1 of 13</i>
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	Quotation no.: 245850604	Auftragsdatum: <i>Order date:</i>	2024-09-26	
Auftraggeber: <i>Client:</i>	Shunhong Environmental Technology (Suzhou) Co., Ltd. No. 305, Tongjiang Road, Bixi Street, Changshu City, 215512 Jiangsu P.R. China			
Prüfgegenstand: <i>Test item:</i>	DC Inverter Monoblock Heat Pump			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	BEHR0080NNSP01			
Auftrags-Inhalt: <i>Order content:</i>	EU energy performance test			
Prüfgrundlage: <i>Test specification:</i>	COMMISSION REGULATION (EU) No 813/2013 COMMISSION DELEGATED REGULATION (EU) No 811/2013			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2025-03-07			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003940389-001			
Prüfzeitraum: <i>Testing period:</i>	2025-03-17 to 2025-03-21			
Ort der Prüfung: <i>Place of testing:</i>	See page 3			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (ShangHai) Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: tested by: Jolin Ge	genehmigt von: authorized by: Korol Zhou			
Datum: Date: 2025-04-23	Jolin Ge		Korol Zhou	
Stellung / Position: Project Engineer	Ausstellungsdatum: Issue date: 2025-04-23		Stellung / Position: Authorizer	
Sonstiges / <i>Other:</i>	This report is only for heating capacity test and sound power level test.			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende: <i>* Legend:</i>	P(ass) = entspricht o.g. Prüfgrundlage(n) <i>P(ass) = passed a.m. test specification(s)</i>	F(ail) = entspricht nicht o.g. Prüfgrundlage(n) <i>F(ail) = failed a.m. test specification(s)</i>	N/A = nicht anwendbar <i>N/A = not applicable</i>	N/T = nicht getestet <i>N/T = not tested</i>
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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Anmerkungen
 Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. <i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i>

Testing results summary

Model designation	BEHR0080NNSP01	
Function	Heating (Average)	
Outlet temperature (°C)	35	55
Design load (kW)	7.95	8.01
Annual energy consumption (kWh)	3085	4250
Seasonal space heating energy efficiency	210	153
Energy class	A+++	A+++

Summary of testing

1. The appliance was evaluated capacity test according to EN 14825:2022, EN 14511-2:2022 and EN 14511-3:2022.
2. The appliance was tested at outlet temperature 35°C and 55°C.
3. The capacity test method is air enthalpy method.
4. The appliance was evaluated sound power level test according to EN 12102-1:2022.
5. All tests were performed on BEHR0100NNSP01.
6. The test location is below.
 For capacity test
 TUV Rheinland Suzhou Co. Ltd.
 Pingqian (Taicang) Modern Industrial Park, No.525, Yuewang Lingang South Road, Shaxi Town, Taicang City, Jiangsu Province, China.
 For sound power level test
 Shunhong Environmental Technology (Suzhou) Co., Ltd.
 No. 305, Tongjiang Road, Bixi Street, Changshu City, 215512 Jiangsu P.R. China

Test sample particulars

Classification of installation and use: Fixed appliance
 Type of the appliance: Air to water heat pump
 Function of the appliance: Space heating and cooling
 Heating season (heating function applicable).....: Average

Possible test case verdicts:

- test case does not apply to the test object: N/A
- test object does meet the requirement: P(Pass)
- test object does not meet the requirement: F(Fail)

Testing.....:

Date of receipt of test item.....: See cover page
 Date (s) of performance of tests.....: See cover page

General product information

The appliance is air to water heat pump for space heating or cooling which installed at outdoor.

The information of compressor, fan motor and water pump are listed as below.

Object / part No.	Manufacturer/ trademark	Type / model	Technical data
Compressor	Mitsubishi Electric (Guangzhou) Compressor Co., Ltd.	MPB42FJDMC-L	R290
Fan motor	Panasonic Motor (Hangzhou) Co., Ltd.	EHTS01ABM	DC 310V 170W 950r/min
Crankcase heater for compressor	Changzhou Match-well Pressure Control Technique Co., Ltd.	JRD-220V-30W-425A- 1500	220VAC±10% 30W
Water pump	Grundfos Holding A/S	UPM4XLK 25-90 130	230VAC,50/60Hz P:2~90W MAX(H):9m MAX(Q):4m3/h

Rating labels and marking:

 Borochoi DC Inverter Monoblock Heat Pump

Model	BEHR0080NNSP01
Power Supply	220 - 240V~, 50Hz
Heating Capacity*/W	8000
Rated Power Input (Heating)*/W	1550
Heating Capacity**/W	7800
Rated Power Input (Heating)**/W	2490
Refrigerant/Weight	R290 /0.89kg
GWP	3
ODP	0
Max Water Pressure/MPa	0.7
Rated Water Pressure/MPa	0.3
Rated Water Flow/m ³ /h	1.35
Operation Pressure ND/MPa	0.05
Operation Pressure HD/MPa	3.2
Waterproof Level	IPX4
Net weight/kg	120
Dimensions/mm	1100*400*1025
Piping connection size	DN25/DN25
Maximum operating power/W	5540
Maximum operating current/A	24.5
*Outdoor air temperature: DB7°C/WB6°C EWT/LWT : 30/35°C	
**Outdoor air temperature: DB7°C/WB6°C EWT/LWT : 50/55°C	
Shunhong Environmental Technology (Suzhou) Co., Ltd. No. 305 Tongjiang Road, Bixi, Changshu, Jiangsu, P.R.China	



COMMISSION REGULATION (EU) No 813/2013 COMMISSION DELEGATED REGULATION (EU) No 811/2013			
Clause	Requirement - Test	Result - Remark	Verdict

COMMISSION REGULATION (EU) No 813/2013			
Article 1	Subject matter and scope		P
1	This Regulation establishes ecodesign requirements for the placing on the market and/or putting into service of space heaters and combination heaters with a rated heat output heater ≤ 400 kW including those integrated in packages of space heater, temperature control and solar device or packages of combination heater, temperature control and solar device as defined in article 2 of Commission Delegated Regulation (EU) No 811/2013.		P
2	This Regulation shall not apply to: (a) heaters specifically designed for using gaseous or liquid fuels predominantly produced from biomass; (b) heaters using solid fuels; (c) heaters within the scope of Directive 2010/75/EU of the European Parliament and of the Council; (d) heaters generating heat only for the purpose of providing hot drinking or sanitary water; (e) heaters for heating and distributing gaseous heat transfer media such as vapour or air; (f) cogeneration space heaters with a maximum electrical capacity of 50 kW or above. (g) heat generators designed for heaters and heater housings to be equipped with such heat generators placed on the market before 1 January 2018 to replace identical heat generators and identical heater housings. The replacement product or its packaging shall clearly indicate the heater for which it is intended.		N/A
Article 3	Ecodesign requirements and timetable		P
1	The ecodesign requirements for heaters are set out in Annex II.		P
2	Each ecodesign requirement shall apply in accordance with the following timetable:		P
	(a) from 26 September 2015: (i) heaters shall meet the requirements set out in Annex II, points 1(a), 3 and 5; (ii) combination heaters shall meet the requirements set out in Annex II, point 2(a);		N/A

COMMISSION REGULATION (EU) No 813/2013 COMMISSION DELEGATED REGULATION (EU) No 811/2013													
Clause	Requirement - Test							Result - Remark				Verdict	
	(a) from 26 September 2017: (i) electric space heaters, electric combination heaters, cogeneration space heaters, heat pump space heaters and heat pump combination heaters shall meet the requirements set out in Annex II, point 1(b); (ii) combination heaters shall meet the requirements set out in Annex II, point 2(b);											P	
	(a) from 26 September 2018 heaters shall meet the requirements set out in Annex II, point 4(a).											N/A	
3	Compliance with ecodesign requirements shall be measured and calculated in accordance with the requirements set out in Annex III.											P	
Annex II	Ecodesign requirements											P	
1	Requirements for seasonal space heating energy efficiency											P	
	(a) From 26 September 2015 the seasonal space heating energy efficiency and useful efficiencies of heaters shall not fall below the following values:											N/A	
	- Heat pump space heaters and heat pump combination heaters, with the exception of low-temperature heat pumps: 100%											N/A	
	- Low-temperature heat pumps: 115%											N/A	
	(b) From 26 September 2017 the seasonal space heating energy efficiency and useful efficiencies of heaters shall not fall below the following values:											P	
	- Heat pump space heaters and heat pump combination heaters, with the exception of low-temperature heat pumps: 110%											P	
	- Low-temperature heat pumps: 125%											P	
2	Requirements for water heating energy efficiency											N/A	
	(a) From 26 September 2015 the water heating energy efficiency of combination heaters shall not fall below the following values:											N/A	
	Declared load profile	3XS	XXS	XS	S	M	L	XL	XXL	3XL	4XL	-	
	Water heating energy efficiency	22%	23%	26%	26%	30%	30%	30%	32%	32%	32%		
	(a) From 26 September 2017 the water heating energy efficiency of combination heaters shall not fall below the following values:											N/A	

COMMISSION REGULATION (EU) No 813/2013 COMMISSION DELEGATED REGULATION (EU) No 811/2013												
Clause	Requirement - Test							Result - Remark				Verdict

	Declared load profile	3XS	XXS	XS	S	M	L	XL	XXL	3XL	4XL		-
	Water heating energy efficiency	32%	32%	32%	32%	36%	37%	38%	60%	64%	64%		
3	Requirements for sound power level												P
	From 26 September 2015 the sound power level of heat pump space heaters and heat pump combination heaters shall not exceed the following values:												P
	Rated heat output ≤ 6 kW		6 kW < Rated heat output ≤ 12 kW		12 kW < Rated heat output ≤ 30 kW		30 kW < Rated heat output ≤ 70 kW					-	
	indoor	outdoor	indoor	outdoor	indoor	outdoor	indoor	outdoor	indoor	outdoor			
	60 dB	65 dB	65 dB	70 dB	70 dB	78 dB	80 dB	88 dB					
4	Requirements for emissions nitrogen oxides												N/A
5	Requirements for product information												N/A
	From 26 September 2015 the following product information on heaters shall be provided:												N/A
	(a) the instruction manuals for installers and end-users, and free access websites of manufacturers, their authorised representatives and importers shall contain the following elements:												N/A
	- For heat pump heaters and heat pump combination heaters, the technical parameters set out in Table 2, measured and calculated in accordance with Annex III;												N/A
	- Any specific precautions that shall be taken when the heater is assembled, installed or maintained;												N/A
	- Information relevant for disassembly, recycling and/or disposal at end-of-life;												N/A
Annex III	Measurements and calculations											P	

COMMISSION DELEGATED REGULATION (EU) No 811/2013

Annex II	Energy efficiency classes											P
1	Seasonal space heating energy efficiency classes											P

COMMISSION REGULATION (EU) No 813/2013 COMMISSION DELEGATED REGULATION (EU) No 811/2013			
Clause	Requirement - Test	Result - Remark	Verdict
	The seasonal space heating energy efficiency class of a heater, with the exception of low-temperature heat pumps and heat pump space heaters for low-temperature application, shall be determined on the basis of its seasonal space heating energy efficiency as set out in Table 1.		P
	The seasonal space heating energy efficiency class of a low-temperature heat pumps and a heat pump space heaters for low-temperature application shall be determined on the basis of its seasonal space heating energy efficiency as set out in Table 2.		P
	The seasonal space heating energy efficiency of a heater shall be calculated in accordance with point 3 and 4 of Annex VII, for heat pump space heaters, heat pump combination heaters and low-temperature heat pumps under average climate conditions.		P
2	Water heating energy efficiency classes		N/A
	The water heating energy efficiency class of a combination heater shall be determined on the basis of its water heating energy efficiency as set out in Table 3.		N/A
	The water heating energy efficiency of a combination heater shall be calculated in accordance with point 5 of Annex VII.		N/A

Measurements and calculations

1) According to standard EN 14511-2

Test condition	Low temperature	Medium temperature
Inlet dry bulb temperature for indoor air °C	--	--
Inlet wet bulb temperature for indoor air °C	--	--
Inlet dry bulb temperature for outdoor air °C	7.00	7.00
Inlet wet bulb temperature for outdoor air °C	6.00	6.00
Inlet temperatures for water °C	29.96	46.93
Outlet temperatures for water °C	35.00	55.00
Tested voltage V	229.60	229.25
Tested frequency Hz	50.0	50.0
Measured capacity W	7854.86	7957.06
Measured power input W	1532.65	2601.01
Tested COP	5.11	3.05
Water volume flow rate m ³ /h	1.35	0.86
Static pressure difference kPa	12.61	5.49
Compressor frequency for inverter type Hz	55	66

2) According to standard EN 14825

Outlet temperature °C	35					
Outlet temperature type	☐ Fixed outlet ☒ Variable outlet					
Test result	Test condition					
	A	B	C	D	E	F
Inlet dry bulb temperature for indoor air °C	--	--	--	--	--	--
Inlet wet bulb temperature for indoor air °C	--	--	--	--	--	--
Inlet dry bulb temperature for outdoor air °C	-7.00	2.00	7.00	12.00	-10.00	-7.00
Inlet wet bulb temperature for outdoor air °C	-7.97	1.00	6.01	11.00	-10.97	-7.97
Inlet temperatures for indoor °C	29.55	27.07	24.86	21.95	30.28	29.55
Outlet temperatures for indoor °C	34.07	30.00	27.10	23.97	35.30	34.07
Measured voltage V	229.4	229.8	229.9	230.0	229.2	229.4
Measured frequency Hz	50.0	50.0	50.0	50.0	50.0	50.0
Measured capacity W	7059	4572	3506	3156	7830	7059

Measured power input W	2187	897	526	327	2779	2187			
Water volume flow rate m ³ /h	1.35	1.35	1.35	1.35	1.35	1.35			
Static pressure difference kPa	12.6	12.8	12.9	13.0	12.6	12.6			
Compressor frequency for inverter type Hz	77	37	24	18	91	77			
Measured power input of compressor off state W	29	29	29	29	29	29			
Corrections of the power input of liquid pump if applicable									
P _{hydrau} W	5	5	5	5	5	5			
Efficiency of the pump	0.17	0.17	0.17	0.17	0.17	0.17			
Capacity correction W	23	23	23	23	23	23			
Power input correction W	27	28	28	28	27	27			
Effective capacity W	7037	4549	3483	3133	7807	7037			
Effectivte power input W	2159	869	498	299	2751	2159			
Calculated COP	3.26	5.23	6.99	10.48	2.84	3.26			
Electric power consumption during thermostat-off mode, standby mode, crankcase heater mode and off mode									
Off mode kW	0.016								
Thermostat-off mode kW	0.029								
Standby mode kW	0.016								
Crankcase heater mode kW	0.048								
Calculations for seasonal space heating energy efficiency									
Test condition	Outdoor heat exchanger	Indoor heat exchanger	Part Load Ratio %	Part Load kW	Tested Capacity kW	Tested COP	Cd	CR	COP at A, B, C, D, E, F condition
	Outdoor air °C	Outlet water temperature °C							
A	-7	34	88.46%	7.04	7.037	3.26	0.99	1.00	3.26
B	2	30	53.85%	4.28	4.549	5.23	0.97	1.00	5.23
C	7	27	34.62%	2.75	3.483	6.99	0.94	0.79	6.88
D	12	24	15.38%	1.22	3.133	10.48	0.90	0.39	9.08
E	-10	35.0	100.00%	7.95	7.807	2.84	0.99	1.00	2.84
F	-7	34.0	88.46%	7.04	7.037	3.26	0.99	1.00	3.26
SCOP _{on}	5.35			SCOP _{net}	5.36				
SCOP	5.33								
η _s	210								

Outlet temperature °C	55
Outlet temperature type	☐ Fixed outlet ☒ Variable outlet
Test result	Test condition

A	-7	52	88.46%	7.09	7.088	2.34	0.99	1.00	2.34
B	2	42	53.85%	4.31	5.017	3.77	0.98	0.86	3.76
C	7	36	34.62%	2.77	2.996	5.18	0.95	1.00	5.18
D	12	30	15.38%	1.23	3.391	7.98	0.93	0.36	7.12
E	-10	55.0	100.00%	8.01	7.767	2.06	0.99	1.00	2.06
F	-7	52.0	88.46%	7.09	7.088	2.34	0.99	1.00	2.34
SCOPon	3.91				SCOPnet	3.91			
SCOP	3.90								
η_s	153								

3) According to EN 12102-1

Test result	Outdoor unit
Sound power level dB(A) for rating heating capacity setting	58.0
Sound power level dB(A) for heating capacity setting of part load C	58.0

- End of report -