

**Technical Report No.: 64.181.21.03199.01 Rev.00**

**Date: 2021-08-20**

Client: Report holder's name: FOSHAN SUOHER ELECTRICAL APPLIANCE CO., LTD

Report holder's Address: Building 8, No.2 ,Nanyi Road, Guangzhu Road, Daliang street, shunde, Foshan, Guangdong, China

Contact person of report holder: QI LI HUA

Manufacturer's name: FOSHAN SUOHER ELECTRICAL APPLIANCE CO., LTD

Manufacturer's address: Building 8, No.2 ,Nanyi Road, Guangzhu Road, Daliang street, shunde, Foshan, Guangdong, China

Factory: Factory's name: FOSHAN SUOHER ELECTRICAL APPLIANCE CO., LTD

Factory's address: Building 8, No.2 ,Nanyi Road, Guangzhu Road, Daliang street, shunde, Foshan, Guangdong, China

Test object: Product: DC Inverter Air to Water Heat Pump  
Model: SHAW-09DM1, SHAW-09DS1

Trade name: -

Test specification:  EN 14825:2018  
 (EU) No 813/2013

Purpose of examination: Test according to the test specification  
 EU 2016/2282:2016-11-30

Test result: The test results show that the presented product is in compliance with the above listed test specifications.

Any use for advertising purposes must be granted in writing. This technical report may only be quoted in full. This report is the result of a single examination of the object in question. It does not imply a general statement regarding the quality of products from regular production. For further details please see testing and certification regulation, chapter A-3.4.

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## 1 Description of the test object

### 1.1 Function

Manufacturer's specification for intended use:

The appliance is air to water heat pump.

Manufacturer's specification for predictive use:

According to user manual.

### 1.2 Consideration of the foreseeable use

- Not applicable
- Covered through the applied standard
- Covered by the following comment
- Covered by attached risk analysis

### 1.3 Technical Data

Model :	SHAW-09DM1, SHAW-09DS1
Rated Voltage (V) :	220-240V~
Rated Frequency (Hz) :	50
Rated Power (W) :	2580
Rated Current (A) :	11.20
Protection Class :	Class I
Protection Against Moisture :	IP X4
Construction :	Stationary
Supply connection :	<input type="checkbox"/> Non detachable cord <input checked="" type="checkbox"/> Permanent connection to fixed wiring
Operation mode:	<input checked="" type="checkbox"/> Continuous operation; <input type="checkbox"/> Intermittent operation; <input type="checkbox"/> Short time operation;
Refrigerant/charge (g) :	R32 /1150g
Declared parameters :	<input checked="" type="checkbox"/> Average <input type="checkbox"/> Warmer <input type="checkbox"/> Colder
Sound power level dB(A) :	N/A
Series No :	P210311001

## 2 Order

### 2.1 Date of Purchase Order, Customer's Reference

2021-06-21, QI LI HUA

### 2.2 Test Sample(s)

- Reception date(s): 2021-06-21

- Location(s) of reception:

For Energy test:

GZ-Lans Experimental Technology Co., Ltd. Laboratory

Address: No.16, Juncheng Road, Huangpu district, Guangzhou, China

- Condition of test sample(s): completed and can be normal operation

### 2.3 Date(s) of Testing

2021-06-21 to 2021-06-27

### 2.4 Location(s) of Testing

Same as 2.2

### 2.5 Points of Non-compliance or Exceptions of the Test Procedure

N/A

## 3 Test Results

### 3.1 Positive Test Results

See Appendix I

## 4 Remark

N/A

**4.1** The user manual has been examined according to the minimum requirements described in the product standard. The manufacturer is responsible for the accuracy of further particulars as well as of the composition and layout.

**4.2** When the product is placed on the market, it must be accompanied with safety Instructions written in official language of the country. The instructions shall give information regarding safe operation, installation and maintenance.

## 5 Documentation

- Appendix I Test results
- Appendix II Marking plate
- Appendix III photo documentation
- Appendix IV Construction data form
- Appendix V Test equipment list

## 6 Summary

- 1) The appliance is DC Inverter Type Air To Water Unit, including a whole compression type refrigerant circuit to heat water in another circuit. The appliance was for cooling and heating water function, this report only for heating capacity test.
- 2) The main power is supplied by a 3-pole supply cable not with plug which not supply by manufactory.
- 3) Water enthalpy method was adopted in this report.
- 4) Standby mode power, off mode power and thermostat-off mode power were tested according to clause 12 of standard EN 14825:2018.
- 5) The model SHAW-09DS1 is same as SHAW-09DM1 except for model's name difference. And the tests are carried out at model SHAW-09DM1.

### TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch TÜV SÜD Group

Tested by: William Liang, Project Handler

*printed name, function & signature*

Approved by: Tony Xie, Designated Reviewer

*printed name, function & signature*



**Appendix I Test results**

<b>Table 1.</b>	<b>Heating mode(Low temperature application):</b>						<b>P</b>
<b>Model</b>	SHAW-09DM1						
<b>Product type</b>	Air to Water	<b>Heating season</b>	<input checked="" type="checkbox"/> Average	<input type="checkbox"/> Warmer	<input type="checkbox"/> Colder		
<b>1. Test conditions:</b>							
<b>Condition</b>	<b>Part Load Ratio</b> in %				<b>Outdoor heat exchanger</b>	<b>Indoor heat exchanger</b>	
	Formula	A	W		Inlet dry (wet) bulb temperature °C	Inlet/outlet water temperatures (°C)	
A	$(-7-16)/(T_{designh-16})$	88	N/A	N/A	-7(-8)	a / 34	
B	$(+2-16)/(T_{designh-16})$	54	N/A	N/A	2(1)	a / 30	
C	$(+7-16)/(T_{designh-16})$	35	N/A	N/A	7(6)	a / 27	
D	$(+12-16)/(T_{designh-16})$	15	N/A	N/A	12(11)	a / 24	
E	$(TOL-16)/(T_{designh-16})$				TOL	a / 35.3	
F	$(T_{bivalent-16})/(T_{designh-16})$				T <sub>biv</sub>	a / 34	
G	$(-15-16)/(T_{designh-16})$	N/A	N/A	N/A	-15	N/A	
Remark: a) With the water flow rate as determined at the standard rating conditions given in EN14511-2 at 30/35 conditions.							
<b>2. Tested data/correction data(Average):</b>							
General test conditions/ Part-Load	Unit	A(-7)/W34 (88%)	A2/W30 (54%)	A7/W27 (35%)	A12/W24 (15%)	A(-10)/W35.3 (100%)	A(-7)/W34 (88%)
	--	A	B	C	D	E	F
Data collection period	hh: min:sec	4:00:00	2:00:00	2:00:00	2:00:00	4:00:00	4:00:00
The heat pump defrosts	--	Yes	No	No	No	Yes	Yes
Complete Cycles	--	2	0	0	0	2	2
Barometric pressure	kPa	101.02	101.02	101.02	101.02	101.02	101.02
Voltage	V	231.2	230.0	230.3	230.8	231.4	231.2
Current input of the unit	A	7.09	3.14	2.79	2.29	7.99	7.09
Power input of the unit	kW	1.611	0.686	0.620	0.502	1.823	1.611
Test conditions <b>indoor</b> unit							
<b>Inlet</b> Water temperature, DB	°C	29.80	27.50	23.86	20.54	30.86	29.80
<b>Outlet</b> Water temperature, DB	°C	33.35*	29.95	26.98	24.00	34.40*	33.35*

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**Appendix I Test results**

Test conditions outdoor unit							
Air inlet temperature, DB	°C	-6.28	2.02	7.01	12.05	-9.73	-6.28
Air inlet temperature, WB	°C	-7.30	1.00	6.00	11.02	-10.53	-7.30
Summary of the results							
Total heating capacity	kW	4.564	3.151	4.013	4.434	4.545	4.564
Effective power input	kW	1.631	0.706	0.640	0.522	1.843	1.631
Coefficient of performance (COP)	--	2.80	4.46	6.27	8.49	2.47	2.80
Compressor frequency	Hz	70	28.00**	30	30	80	70
Water flow	m³/h	1.10	1.10	1.10	1.10	1.10	1.10
Remark: * In part condition, outlet temperature data is recorded by a full average complete cycle's data. **In part condition, 28Hz is lowest compressor frequency.							
3.Calculation/conclusion for SCOP(Average):							
Tdesignh(°C)	-10	Tbiv(°C)		-7			
Pdesignh(kW)	5.159	TOL(°C)		-10			
Test result A, B, C, D, E, F conditions:							
Condition	Part load	Measured capacity	COP at measured capacity	Cdh	CR	COP at part load	
E	5.159	4.545	2.47	0.00	1.00	2.47	
F	4.564	4.564	2.80	0.00	1.00	2.80	
A	4.564	4.564	2.80	0.00	1.00	2.80	
B	2.778	3.151	4.46	0.99	0.88	4.46	
C	1.786	4.013	6.27	0.99	0.44	6.20	
D	0.794	4.434	8.49	0.99	0.18	8.12	
CR: part load divided by capacity;							

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**Appendix I Test results**

Electric power consumptions	Unit	Value
Thermostat-off mode [ $P_{TO}$ ]	kW	0.008
Standby mode [ $P_{SB}$ ]	kW	0.008
Crankcase heater [ $P_{CK}$ ]	kW	0.000
Off mode [ $P_{OFF}$ ]	kW	0.008

Conclusions:	Unit	Value
SCOP <sub>on</sub> :	kWh/kWh	4.62
SCOP:	kWh/kWh	4.62
$Q_H$ :	kWh/year	10658
$Q_{HE}$ :	kWh/year	2307
$\eta_{s,h}$	%	181.8
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 2)	--	A+++

**Appendix I Test results**

<b>Table 2.</b>	<b>Heating mode(Medium temperature application):</b>						<b>P</b>	
<b>Model</b>	SHAW-09DM1							
<b>Product type</b>	Air to Water	<b>Heating season</b>	<input checked="" type="checkbox"/> Average	<input type="checkbox"/> Warmer	<input type="checkbox"/> Colder			
<b>1. Test conditions:</b>								
<b>Condition</b>	<b>Part Load Ratio</b> in %				<b>Outdoor heat exchanger</b>	<b>Indoor heat exchanger</b>		
	Formula	A	W	C	Inlet dry (wet) bulb temperature °C	Inlet/outlet water temperatures (°C)		
A	$(-7-16)/(T_{designh-16})$	88	N/A	N/A	-7(-8)	a / 52		
B	$(+2-16)/(T_{designh-16})$	54	N/A	N/A	2(1)	a / 42		
C	$(+7-16)/(T_{designh-16})$	35	N/A	N/A	7(6)	a / 36		
D	$(+12-16)/(T_{designh-16})$	15	N/A	N/A	12(11)	a / 30		
E	$(TOL-16)/(T_{designh-16})$				TOL	a / 55.3		
F	$(T_{bivalent-16})/(T_{designh-16})$				Tbiv	a / 52		
G	$(-15-16)/(T_{designh-16})$	N/A	N/A	N/A	-15	N/A		
Remark: a) With the water flow rate as determined at the standard rating conditions given in EN14511-2 at 47/55 conditions.								
<b>2. Tested data/correction data(Average):</b>								
General test conditions/ Part-Load	Unit	A(-7)/W52 (88%)	A2/W42 (54%)	A7/W36 (35%)	A12/W30 (15%)	A(-10)/W55.3 (100%)	A(-7)/W52 (88%)	
	--	A	B	C	D	E	F	
Data collection period	hh: min:sec	2:00:00	2:00:00	2:00:00	2:00:00	4:00:00	2:00:00	
The heat pump defrosts	--	No	No	No	No	Yes	No	
Complete Cycles	--	0	0	0	0	1	0	
Barometric pressure	kPa	101.02	101.02	101.02	101.02	101.02	101.02	
Voltage	V	233.7	230.7	230.8	232.9	233.5	233.7	
Current input of the unit	A	12.12	4.07	3.37	2.72	11.36	12.12	
Power input of the unit	kW	2.820	0.926	0.763	0.614	2.636	2.820	
Test conditions <b>indoor</b> unit								
<b>Inlet</b> Water temperature, DB	°C	45.55	38.20	31.37	24.89	49.09	45.55	
<b>Outlet</b> Water temperature, DB	°C	52.23	41.92	35.84	29.91	54.21*	52.23	

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**Appendix I Test results**

Test conditions outdoor unit							
Air inlet temperature, DB	°C	-6.97	2.05	7.01	12.13	-9.73	-6.97
Air inlet temperature, WB	°C	-8.12	1.01	6.00	11.01	-10.58	-8.12
Summary of the results							
Total heating capacity	kW	5.835	3.171	3.801	4.393	4.474	5.835
Effective power input	kW	2.829	0.935	0.773	0.623	2.645	2.829
Coefficient of performance (COP)	--	2.06	3.39	4.92	7.05	1.69	2.06
Compressor frequency	Hz	80	31	30	30	80	80
Water flow	m³/h	0.75	0.75	0.75	0.75	0.75	0.75
Remark: * In part condition, outlet temperature data is recorded by a full average complete cycle's data.							
3.Calculation/conclusion for SCOP(Average):							
Tdesignh(°C)	-10	Tbiv(°C)		-7			
Pdesignh(kW)	6.596	TOL(°C)		-10			
Test result A, B, C, D, E, F conditions:							
Condition	Part load	Measured capacity	COP at measured capacity	Cdh	CR	COP at part load	
E	6.596	4.474	1.69	0.00	1.00	1.69	
F	5.835	5.835	2.06	0.00	1.00	2.06	
A	5.835	5.835	2.06	0.00	1.00	2.06	
B	3.552	3.171	3.39	0.00	1.00	3.39	
C	2.283	3.801	4.92	0.99	0.60	4.89	
D	1.015	4.393	7.05	0.99	0.23	6.83	
CR: part load divided by capacity;							




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**Appendix I Test results**

Electric power consumptions	Unit	Value
Thermostat-off mode [ $P_{TO}$ ]	kW	0.008
Standby mode [ $P_{SB}$ ]	kW	0.008
Crankcase heater [ $P_{CK}$ ]	kW	0.000
Off mode [ $P_{OFF}$ ]	kW	0.008

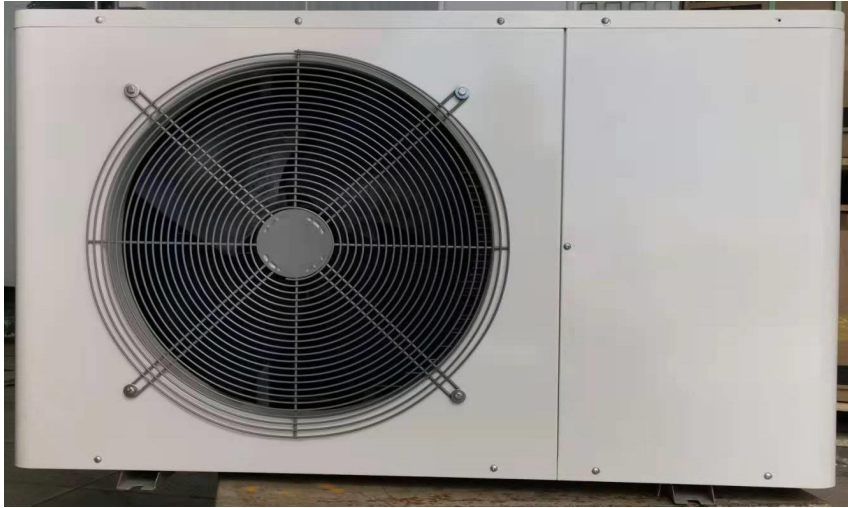
Conclusions:	Unit	Value
SCOP <sub>on</sub> :	kWh/kWh	3.30
SCOP:	kWh/kWh	3.30
$Q_H$ :	kWh/year	13627
$Q_{HE}$ :	kWh/year	4132
$\eta_{s,h}$	%	128.9
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 1)	--	A++

Appendix II Marking plate

Nameplate	
<b>Model: <u>SHAW-09DM1</u></b>	
<b>DC Inverter Air to Water Heat Pump</b>	
Model	SHAW-09DM1
Power supply	220~240V~, 50Hz
Heating capacity (A7 / W35)	3.6~9.0 kW
Heating power input (A7/ W35)	0.69~2.12 kW
Cooling capacity (A35 / W7)	3.1~7.5 kW
Cooling power input (A35 / W7)	0.81~2.32 kW
Moisture resistance	IPX4
Electrical shockproof	I
Rated current	11.2A
Rated power	2580W
Refrigerant	R32
Quantity of refrigerant	1.15 kg
Water flow volume	1.6 m3/h
Water connection	DN25
Noise level	49 dB(A)
Net size (L*D*H)	1105*460*695 mm
Net weight	104 kg
Operation pressure(low side)	1.2MPa
Operation pressure(high side)	4.0MPa
Maximum allowable pressure	4.2MPa
FOSHAN SUOHER ELECTRICAL APPLIANCE CO., LTD Building 8, No.2 ,Nanyi Road, Guangzhu Road, Daliang street, shunde, Foshan, Guangdong, China	
Contains fluorinated greenhouse gas. Refrigerant: R32 GWP value: 670 System charge weight: 1.15kg CO2 equivalent charge weight: 0.771 ton	
  	
Remark: The model SHAW-09DS1 is same as SHAW-09DM1 except for model's name difference.	

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Appendix III photo documentaiton

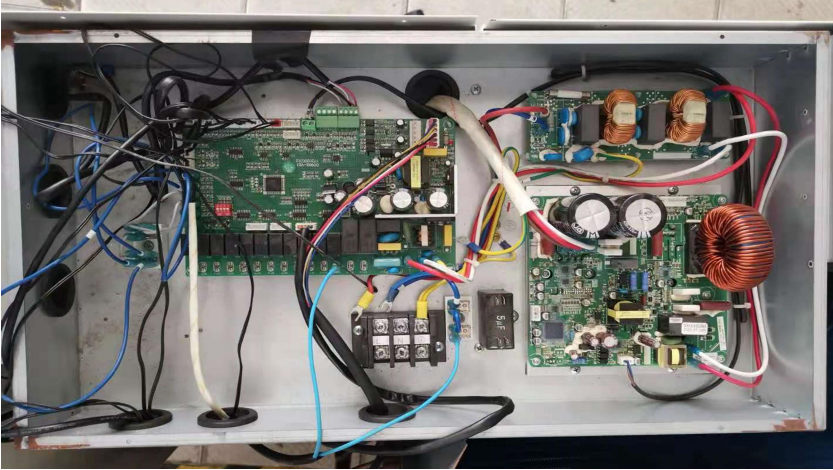
Details of:	Overall view
<p><b>View:</b></p> <p><input type="checkbox"/> General</p> <p><input type="checkbox"/> Front</p> <p><input type="checkbox"/> Rear</p> <p><input type="checkbox"/> Right</p> <p><input type="checkbox"/> Left</p> <p><input type="checkbox"/> Top</p> <p><input type="checkbox"/> Bottom</p>	

Details of:	Compressor
<p><b>View:</b></p> <p><input type="checkbox"/> General</p> <p><input type="checkbox"/> Front</p> <p><input type="checkbox"/> Rear</p> <p><input type="checkbox"/> Right</p> <p><input type="checkbox"/> Left</p> <p><input type="checkbox"/> Top</p> <p><input type="checkbox"/> Bottom</p>	

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**Appendix III photo documentaiton**

Details of:	Fan Motor
View:	
<input type="checkbox"/> General	
<input type="checkbox"/> Front	
<input type="checkbox"/> Rear	
<input type="checkbox"/> Right	
<input type="checkbox"/> Left	
<input type="checkbox"/> Top	
<input type="checkbox"/> Bottom	

Details of:	Main Control Board
View:	
<input type="checkbox"/> General	
<input type="checkbox"/> Front	
<input type="checkbox"/> Rear	
<input type="checkbox"/> Right	
<input type="checkbox"/> Left	
<input type="checkbox"/> Top	
<input type="checkbox"/> Bottom	

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**Appendix IV Construction data form**

<b>Model: SHAW-09DM1, SHAW-09DS1</b>		
<b>Part</b>		<b>Technical data</b>
<b>1. Compressor</b>		
	Manufacture:	Panasonic Wanbao Appliances Compressor (Guangzhou) Co., Ltd
	Type:	9RD220ZAA21
	Rated capacity:	6421W; R32
	Serial-number:	9RD220ZAA21F0000017
<b>2. Condenser</b>		
	Manufacture:	SWEP Technology (Suzhou) Co., Ltd.
	Type:	F85H*30/1P-NSC-M 9.65+16+2*28.75
	Heat exchanger:	Plate heat exchanger
	Dimension (mm):	119mm*526mm*65mm
<b>3. Evaporator</b>		
	Manufacture:	Foshan Hanlin Refrigeration Equipment Co., Ltd
	Type:	310204018
	Heat exchanger:	Finned heat exchanger
	Dimension (mm):	1026mm*44mm*800mm
<b>4. Fan motor</b>		
	Manufacture:	Jiangmen LT Motor Co., Ltd.
	Type:	RD80HA4
	Fan type:	4 blade
<b>5. Main control board</b>		
	Manufacture:	Guangdong Chico Electronic Inc.
	Type:	SH333046
	Specification:	220-240V; 50Hz

**Appendix V Equipment List**

No.	Type	Manufacture	Model	Equipment ID	Calibration Due Date
1	R&A performance measuring system	GEI	20kW	-	2022-08-02
2	Temperature and humidity meter	VAISALA	HMD42	H5110021	2022-08-02
3	Platinum resistance	YINUO	Pt100	7430F	2022-05-20
4	Platinum resistance	YINUO	Pt100	7434F	2022-05-20
5	Flowmeter	YOKOGAWA	AXF015G	S5M201965	2022-05-20
6	Flowmeter	YOKOGAWA	AXF040G	S5M805005	2022-05-20
7	Pressure transmitter	MICRO	MPM489	240502	2022-08-02
8	Pressure transmitter	MICRO	MPM489	240503	2022-08-02
9	Water pressure difference transmitter	MICRO	MDM3051	291459	2022-08-02
10	AC source Supply	YANGHONG	YF-3600	-	2022-01-01
11	Water pressure difference transmitter	MICRO	MDM3051	291459	2022-08-02
12	AC source Supply	YANGHONG	YF-3600	-	2022-01-01
13	Temperature and humidity meter	H5110021	HMD42	VAISALA	2022-08-02

-- End of Report --