

**Technical Report No.: 64.181.22.01083.01 Rev.00**

**Date: 2022-05-18**

Client: Report holder's name: Guangdong Sunrain Air Source Energy Co., Ltd

Report holder's Address: No.73 Defu Road, Xingtan Town Shunde District 528325 Foshan City, Guangdong Province, People's Republic of China

Contact person of applicant: Rocky Zhu

Manufacturer's name: Guangdong Sunrain Air Source Energy Co., Ltd

Manufacturer's address: No.73 Defu Road, Xingtan Town Shunde District 528325 Foshan City, Guangdong Province, People's Republic of China

Factory: Factory's name: Guangdong Sunrain Air Source Energy Co., Ltd

Factory's address: No.73 Defu Road, Xingtan Town Shunde District 528325 Foshan City, Guangdong Province, People's Republic of China

Test object: Product: Air Source Heat Pump  
Model: BLN-010TB1

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.

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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 :	BLN-010TB1
Rated Voltage (V) :	220-240V~
Rated Frequency (Hz) :	50
Rated Power (W) :	3830
Rated Current (A) :	17.00
Protection Class :	Class I
Protection Against Moisture :	IPX4
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 /1800g
Declared parameters :	<input checked="" type="checkbox"/> Average <input type="checkbox"/> Warmer <input type="checkbox"/> Colder
Sound power level dB(A) :	N/A
Series No :	8A00220429003006

## 2 Order

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

2022-04-02 , Guangdong Sunrain Air Source Energy Co., Ltd

### 2.2 Test Sample(s)

- Reception date(s): 2022-04-02

- 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

2022-04-02 to 2022-04-07

### 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 par-ticulars 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 re-garding 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 Intelligent Inverter Heat Pump, 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 cord connecting to fixed wiring.
- 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.

**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: Plum Li, 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>	BLN-010TB1							
<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, the capacity is 10351.60W, power is 2359.08W, COP is 4.39.								
<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	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	229.9	231.4	230.2	230.0	230.1	229.9	
Current input of the unit	A	9.63	3.64	3.17	2.58	9.58	9.63	
Power input of the unit	kW	2.212	1.001	0.715	0.575	2.201	2.212	
<b>Test conditions indoor unit</b>								
<b>Inlet Water temperature, DB</b>	°C	30.49	27.80	24.99	21.65	32.53	30.49	
<b>Outlet Water temperature, DB</b>	°C	33.94	30.06	27.01	24.04	35.25	33.94	

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**Appendix I Test results**

Test conditions outdoor unit							
Air inlet temperature, DB	°C	-7.00	2.01	6.99	12.00	-10.00	-7.00
Air inlet temperature, WB	°C	-8.16	1.00	5.96	11.03	-10.91	-8.16
Summary of the results							
Total heating capacity	kW	7.014	4.289	4.094	4.847	5.489	7.014
Effective power input	kW	2.203	0.992	0.707	0.567	2.193	2.203
Coefficient of performance (COP)	--	3.18	4.32	5.79	8.55	2.50	3.18
Compressor frequency	Hz	75	37	30	30	75	75
Water flow	m³/h	1.75	1.75	1.75	1.75	1.75	1.75
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)	7.928	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	7.928	5.489	2.50	0.00	1.00	2.50	
F	7.014	7.014	3.18	0.00	1.00	3.18	
A	7.014	7.014	3.18	0.00	1.00	3.18	
B	4.269	4.289	4.32	0.00	1.00	4.32	
C	2.744	4.094	5.79	0.99	0.67	5.77	
D	1.220	4.847	8.55	0.99	0.25	8.31	
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	0.009
Standby mode [ $P_{SB}$ ]	kW	0.009
Crankcase heater [ $P_{CK}$ ]	kW	0.040
Off mode [ $P_{OFF}$ ]	kW	0.009

Conclusions:	Unit	Value
SCOPon:	kWh/kWh	4.56
SCOP:	kWh/kWh	4.55
$Q_H$ :	kWh/year	16380
$Q_{HE}$ :	kWh/year	3602
$\eta_{s,h}$	%	178.9
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>	BLN-010TB1						
<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 in %</b>				<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	$(T_{bivalent-16})/(T_{designh-16})$				T <sub>biv</sub>	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. the capacity is 9282.00W, power is 2970.00W, COP is 3.13.							
<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	2:00:00	2:00:00
The heat pump defrosts	--	No	No	No	No	No	No
Complete Cycles	--	0	0	0	0	0	0
Barometric pressure	kPa	99.85	99.85	99.85	99.80	99.75	99.85
Voltage	V	229.3	229.2	229.4	229.8	229.3	229.3
Current input of the unit	A	12.71	5.98	4.56	3.86	13.21	12.71
Power input of the unit	kW	2.859	1.310	0.893	0.697	2.977	2.859
<b>Test conditions indoor unit</b>							
<b>Inlet Water temperature, DB</b>	°C	46.30	38.45	32.75	26.09	49.49	46.30
<b>Outlet Water temperature, DB</b>	°C	51.89	42.03	36.09	30.03	55.05*	51.89

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**Appendix I Test results**

Test conditions <b>outdoor</b> unit							
Air inlet temperature, DB	°C	-7.01	1.99	6.99	11.99	-10.01	-7.01
Air inlet temperature, WB	°C	-8.07	0.99	5.98	10.99	-10.88	-8.07
Summary of the results							
Total heating capacity	kW	6.482	4.145	3.946	4.582	6.415	6.482
Effective power input	kW	2.852	1.303	0.886	0.690	2.970	2.852
Coefficient of performance (COP)	--	2.27	3.18	4.46	6.65	2.16	2.27
Compressor frequency	Hz	71	38	30	30	71	71
Water flow	m³/h	1.01	1.01	1.01	1.01	1.01	1.01
Remark: * In part condition, outlet temperature data is recorded by a full average complete cycle's data.							
<b>3.Calculation/conclusion for SCOP(Average):</b>							
Tdesignh(°C)	-10	Tbiv(°C)		-7			
Pdesignh(kW)	7.328	TOL(°C)		-10			
<b>Test result A, B, C, D, E, F conditions:</b>							
Condition	Part load	Measured capacity	COP at measured capacity	Cdh	CR	COP at part load	
E	7.328	6.415	2.16	0.00	1.00	2.16	
F	6.482	6.482	2.27	0.00	1.00	2.27	
A	6.482	6.482	2.27	0.00	1.00	2.27	
B	3.946	4.145	3.18	0.00	0.95	3.18	
C	2.537	3.946	4.46	0.99	0.64	4.43	
D	1.127	4.582	6.65	0.99	0.25	6.45	
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	0.009
Standby mode [ $P_{SB}$ ]	kW	0.009
Crankcase heater [ $P_{CK}$ ]	kW	0.040
Off mode [ $P_{OFF}$ ]	kW	0.009


Conclusions:	Unit	Value
SCOP <sub>on</sub> :	kWh/kWh	3.42
SCOP:	kWh/kWh	3.41
$Q_H$ :	kWh/year	15139
$Q_{HE}$ :	kWh/year	4437
$\eta_{s,h}$	%	133.5
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 1)	--	A++


Appendix II Marking plate

Nameplate			
<b>Model: BLN-010TB1</b>			
<b>Air Source Heat Pump</b>			
Model		BLN-010TB1	
Power Supply		220-240V~/50Hz	
Heating <sup>1</sup>	Capacity	kW	4.20-12.20
	Input Power	kW	0.86-2.88
	Input Current	A	3.82-12.77
Heating <sup>2</sup>	Capacity	kW	3.85-11.20
	Input Power	kW	1.13-3.75
	Input Current	A	5.01-16.6
Cooling	Capacity	kW	2.60-10.30
	Input Power	kW	0.91-3.65
	Input Current	A	4.03-16.19
SCOP (Water Temp. At 35°C)		4.55	
SCOP (Water Temp. At 55°C)		3.41	
Rated Input Power		kW	3.83
Rated Input Current		A	17
Refrigerant Type/Charge/GWP		.../kg	R32/1.8/675
CO <sub>2</sub> Equivalent		/	1.21t
Operation Pressure(Low Side)		MPa	1.5
Operation Pressure(High Side)		MPa	4.4
Maximum Allowable Pressure		MPa	4.4
Electrical Shockproof		/	I
IP Class		/	IPX4
Max. Outlet Water Temp.		°C	60
Operating Ambient Temperature		°C	-25 ~ 45
Water Piping Connections		mm	G1
Rated Water Flow		m <sup>3</sup> /h	1.75
Water Pressure Drop		kPa	27
Min/Max Water Pressure		MPa	0.1/0.3
Noise Level		dB(A)	51
Net Dimensions ( L×W×H )		mm	1100×445×850
Net Weight		kg	107
Rated Test Conditions: Heating <sup>1</sup> : Ambient Temp 7°C/6°C (DB/WB), Water-In/Out Temp 30°C/35°C Heating <sup>2</sup> : Ambient Temp 7°C/6°C (DB/WB), Water-In/Out Temp 47°C/55°C Cooling: Ambient Temp 35°C/24°C (DB/WB), Water-In/Out Temp 12°C/7°C Guangdong Sunrain Air Source Energy Co.,Ltd. No.73 Defu Avenue, Xingtan Town, Shunde District, Foshan City, Guangdong Province, China			
   			

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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 III photo documentaiton**

Details of:	Water Pump
<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 IV Construction data form**

Model: <u>BLN-010TB1</u>		
Part		Technical data
1. Compressor		
	Manufacture:	Panasonic Wanbao Appliances Compressor (Guangzhou) Co., Ltd.
	Type:	9RD220ZDA2J
	Rated capacity:	2340W
	Serial-number:	7975407
	Specification:	DC280V; R32
2. Condenser		
	Manufacture:	Weyee Heat Exchanger Corporation Limited
	Type:	TY-BH-02-003
	Heat exchanger:	Plate heat exchanger
	Dimension(mm):	333mm*121mm*87mm
3. Evaporator		
	Manufacture:	Guangzhou Aotai Refrigeration Equipment Co., Ltd.
	Type:	DKLNSC-10PN8A1-LQ-1
	Heat exchanger:	Finned heat exchanger
	Dimension(mm):	748mm*368mm*798mm
4. Fan motor		
	Manufacture:	Jiangmen LT Motor Co.,Ltd.
	Type:	RD85HA
	Fan type:	3 blade
	Specification:	DC310V; 85W
5. Main control board		
	Manufacture:	GUANGDONG REAL-DESIGN INTELLIGENCE TECHNOLOGY CO., LTD.
	Type:	R-SY001-M-V2.0
	Specification:	380-420V; 50Hz
6. Water pump		
	Manufacture:	Grundfos Golding A/S
	Type:	UPM3K-25-75
	Specification:	inputpower: 60W, L=130mm, G1.5"

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**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	-	2023-01-01
11	Water pressure difference transmitter	MICRO	MDM3051	291459	2022-08-02
12	AC source Supply	YANGHONG	YF-3600	-	2023-01-01
13	Temperature and humidity meter	H5110021	HMD42	VAISALA	2022-08-02

-- End of Report --