

Technical Report No.: 64.181.21.00277.01 Rev.00

Date: 2021-02-04

Client: Name: Guangdong Sunrain Air Source Energy Co., Ltd

Address: No.73 Defu Rd. Xingtian Town, Foshan City, Guangdong Province, P.R. of China

Contact person: Rocky Zhu

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

Address: No.73 Defu Rd. Xingtian Town, Foshan City, Guangdong Province, P.R. of China

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

Address: No.73 Defu Rd. Xingtian Town, Foshan City, Guangdong Province, P.R. of China

Test subject: Product: Air Source Heat Pump

Type: BLN-012TA1, BLN-012TA2, BLN-012TA3, BLN- 012TA4

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 specified requirements

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Doc No.: ITC-TTW0902.02E – Rev.7

1 Description of the test subject

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-012TA1, BLN-012TA2, BLN-012TA3, BLN-012TA4		
Rated Voltage (V) :	220-240V~		
Rated Frequency (Hz) :	50		
Rated Power (W) :	5300		
Rated Current (A) :	22.0		
Protection Class :	Class I		
Protection Against Moisture :	IP X4		
Construction :	Stationary		
Supply connection :	☐ Non detachable cord ☒ Permanent connection to fixed wiring		
Operation mode:	☒ Continuous operation; ☐ Intermittent operation; ☐ Short time operation;		
Refrigerant/charge (g) :	R410A /1750g		
Declared parameters :	☒ Average ☐ Warmer ☐ Colder		
Sound power level dB(A) :	N/A		
Series No :	6B00201018000534		

2 Order

2.1 Date of Purchase Order, Customer's Reference

2021-01-06, Rocky Zhu

2.2 Receipt of Test Sample, Condition, Location

2021-01-06

For Energy test:

GZ-Lans Experimental Technology Co., Ltd. Laboratory

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

2.3 Date of Testing

2021-01-19 to 2021-01-21

2.4 Location 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 models BLN-012TA2, BLN-012TA3, BLN-012TA4 are same as BLN-012TA1 except for model's name difference. And the tests are carried out at model BLN-012TA1.

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



Doc No.: ITC-TTW0902.02E – Rev.7

Appendix I Test results

Table 1.	Heating mode(Low temperature application):						P
Model	BLN-012TA1						
Product type	Air to Water	Heating season	☒ Average	☐ Warmer	☐ Colder		
1. Test conditions:							
Condition	Part Load Ratio in %				Outdoor heat exchanger	Indoor heat exchanger	
	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	$(T_{bivalent}-16)/(T_{designh}-16)$				Tbiv	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.							
2.Tested data/correction data(Average):							
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	4:00:00	2:00:00	2:00:00	4:00:00	4:00:00
The heat pump defrosts	--	Yes	Yes	No	No	Yes	Yes
Complete Cycles	--	1	1	0	0	1	1
Barometric pressure	kPa	101.02	101.02	101.02	101.02	101.02	101.02
Voltage	V	229.4	229.4	229.5	230.0	229.4	229.4
Current input of the unit	A	11.19	4.87	2.82	2.41	13.53	11.19
Power input of the unit	kW	2.555	1.073	0.564	0.470	3.082	2.555
Test conditions indoor unit							
Inlet Water temperature, DB	°C	30.18	27.58	25.26	21.87	31.14	30.18
Outlet Water temperature, DB	°C	33.75	29.87	27.04	23.94	35.21	33.75

Doc No.: ITC-TTW0902.02E – Rev.7

Appendix I Test results

Test conditions outdoor unit							
Air inlet temperature, DB	°C	-6.96	2.04	7.05	12.05	-9.95	-6.96
Air inlet temperature, WB	°C	-8.22	1.00	6.00	11.00	-10.96	-8.22
Summary of the results							
Total heating capacity	kW	7.186	4.626	3.616	4.177	8.198	7.186
Effective power input	kW	2.623	1.141	0.631	0.538	3.150	2.623
Coefficient of performance (COP)	--	2.74	4.06	5.73	7.76	2.60	2.74
Compressor frequency	Hz	68	40	25	25	85	68
Water flow	m³/h	1.72	1.72	1.72	1.72	1.72	1.72
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)	8.123		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	8.123	8.198	2.60	0.00	0.99	2.60	
F	7.186	7.186	2.74	0.00	1.00	2.74	
A	7.186	7.186	2.74	0.00	1.00	2.74	
B	4.374	4.626	4.06	0.00	0.95	4.06	
C	2.812	3.616	5.73	0.99	0.78	5.71	
D	1.250	4.177	7.76	0.99	0.30	7.58	
CR: part load divided by capacity;							

Doc No.: ITC-TTW0902.02E – Rev.7

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	0.034
Off mode [P_{OFF}]	kW	0.009

Conclusions:	Unit	Value
SCOP _{on} :	kWh/kWh	4.31
SCOP:	kWh/kWh	4.30
Q_H :	kWh/year	16782
Q_{HE} :	kWh/year	3900
$\eta_{s,h}$	%	169.1
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 2)	--	A++

Appendix I Test results

Table 2.	Heating mode(Medium temperature application):						P	
Model	BLN-012TA1							
Product type	Air to Water	Heating season	☒	Average	☐	Warmer	☐	Colder
1. Test conditions:								
Condition	Part Load Ratio in %				Outdoor heat exchanger	Indoor heat exchanger		
	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.								
2.Tested data/correction data(Average):								
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	4:00:00	2:00:00	2:00:00	4:00:00	2:00:00	
The heat pump defrosts	--	No	Yes	No	No	Yes	No	
Complete Cycles	--	0	1	0	0	1	0	
Barometric pressure	kPa	101.02	101.02	101.02	101.02	101.02	101.02	
Voltage	V	229.4	229.8	229.4	229.6	228.9	229.4	
Current input of the unit	A	14.68	6.06	3.35	2.83	20.17	14.68	
Power input of the unit	kW	3.346	1.356	0.700	0.571	4.583	3.346	
Test conditions indoor unit								
Inlet Water temperature, DB	°C	47.04	39.07	34.15	27.68	49.58	47.04	
Outlet Water temperature, DB	°C	52.10	42.01	36.03	29.98	55.06	52.10	

Doc No.: ITC-TTW0902.02E – Rev.7

Appendix I Test results

Test conditions outdoor unit							
Air inlet temperature, DB	°C	-6.86	2.05	7.04	12.04	-9.96	-6.86
Air inlet temperature, WB	°C	-8.18	1.00	5.99	10.99	-11.01	-8.18
Summary of the results							
Total heating capacity	kW	8.150	4.767	3.067	3.763	8.826	8.150
Effective power input	kW	3.392	1.402	0.745	0.616	4.628	3.392
Coefficient of performance (COP)	--	2.40	3.40	4.12	6.10	1.91	2.40
Compressor frequency	Hz	80	40	25	25	85	80
Water flow	m³/h	1.40	1.40	1.40	1.40	1.40	1.40
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)	9.214		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	9.214	8.826	1.91	0.00	1.00	1.91	
F	8.150	8.150	2.40	0.00	1.00	2.40	
A	8.150	8.150	2.40	0.00	1.00	2.40	
B	4.961	4.767	3.40	0.00	1.00	3.40	
C	3.189	3.067	4.12	0.00	1.00	4.12	
D	1.417	3.763	6.10	0.99	0.38	6.01	
CR: part load divided by capacity;							

Doc No.: ITC-TTW0902.02E – Rev.7

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Electric power consumptions	Unit	Value
Thermostat-off mode [P_{TO}]	kW	0.009
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Crankcase heater [P_{CK}]	kW	0.034
Off mode [P_{OFF}]	kW	0.009

Conclusions:	Unit	Value
SCOP _{on} :	kWh/kWh	3.30
SCOP:	kWh/kWh	3.29
Q_H :	kWh/year	19035
Q_{HE} :	kWh/year	5782
$\eta_{s,h}$	%	128.7
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 1)	--	A++

Appendix II Marking plate

Nameplate																																																	
Model: <u>BLN-012TA1</u>																																																	
<table border="1"> <thead> <tr> <th colspan="2">Air Source Heat Pump</th></tr> </thead> <tbody> <tr> <td>Model No.</td><td>BLN-012TA1</td></tr> <tr> <td>Power supply</td><td>220V~240V~/50HZ</td></tr> <tr> <td>Heating capacity at A7/W35</td><td>12 (3.2~12.8)KW</td></tr> <tr> <td>Input power</td><td>2.60KW</td></tr> <tr> <td>COP</td><td>4.62</td></tr> <tr> <td>Heating capacity at A7/W55</td><td>10(3.1~10.9)KW</td></tr> <tr> <td>Input power</td><td>2.82KW</td></tr> <tr> <td>COP</td><td>3.54</td></tr> <tr> <td>Cooling capacity at A35/W7</td><td>8(2.6-9.1)KW</td></tr> <tr> <td>Input power</td><td>2.25KW</td></tr> <tr> <td>EER</td><td>3.56</td></tr> <tr> <td>Rated input power</td><td>5.30KW</td></tr> <tr> <td>Rated input current</td><td>22.0A</td></tr> <tr> <td>Refrigerant</td><td>R410A /1.75KG</td></tr> <tr> <td>Net weight</td><td>75KG</td></tr> <tr> <td>Dimension</td><td>1005*375*800mm</td></tr> <tr> <td>Working temperature range</td><td>-30~48°C</td></tr> <tr> <td>IP Class</td><td>IPX4</td></tr> <tr> <td>Noise level</td><td>58dB(A)</td></tr> <tr> <td>Max. running pressure of exhaust/suction side</td><td>4.4/2.7MPa</td></tr> <tr> <td>Max. allowable pressure of high/low pressure side</td><td>4.4MPa</td></tr> <tr> <td colspan="2"> Guangdong Sunrain Air Source Energy Co., Ltd No.73 Defu Rd. Xingtian Town, Foshan City, Guangdong Province, P.R. of China </td></tr> <tr> <td colspan="2">   </td></tr> </tbody> </table>		Air Source Heat Pump		Model No.	BLN-012TA1	Power supply	220V~240V~/50HZ	Heating capacity at A7/W35	12 (3.2~12.8)KW	Input power	2.60KW	COP	4.62	Heating capacity at A7/W55	10(3.1~10.9)KW	Input power	2.82KW	COP	3.54	Cooling capacity at A35/W7	8(2.6-9.1)KW	Input power	2.25KW	EER	3.56	Rated input power	5.30KW	Rated input current	22.0A	Refrigerant	R410A /1.75KG	Net weight	75KG	Dimension	1005*375*800mm	Working temperature range	-30~48°C	IP Class	IPX4	Noise level	58dB(A)	Max. running pressure of exhaust/suction side	4.4/2.7MPa	Max. allowable pressure of high/low pressure side	4.4MPa	Guangdong Sunrain Air Source Energy Co., Ltd No.73 Defu Rd. Xingtian Town, Foshan City, Guangdong Province, P.R. of China		 	
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Doc No.: ITC-TTW0902.02E – Rev.7

Appendix III photo documentaiton

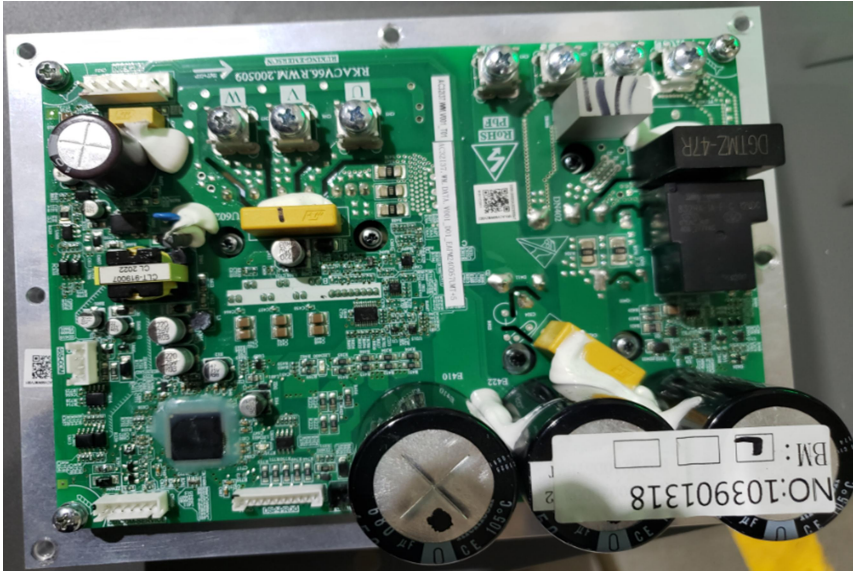
Details of:	Overall view for BLN-012TA1, BLN-012TA2
View:	
☐ General	
☐ Front	
☐ Rear	
☐ Right	
☐ Left	
☐ Top	
☐ Bottom	

Details of:	Compressor
View:	
☐ General	
☐ Front	
☐ Rear	
☐ Right	
☐ Left	
☐ Top	
☐ Bottom	

Doc No.: ITC-TTW0902.02E – Rev.7

Appendix III photo documentaiton

Details of:	Fan Motor
View:	
☐ General	
☐ Front	
☐ Rear	
☐ Right	
☐ Left	
☐ Top	
☐ Bottom	

Details of:	Main Control Board
View:	
☐ General	
☐ Front	
☐ Rear	
☐ Right	
☐ Left	
☐ Top	
☐ Bottom	

Doc No.: ITC-TTW0902.02E – Rev.7

Appendix III photo documentaiton

Details of:	Overall view for BLN-012TA3, BLN-012TA4
View:	
☐ General	
☐ Front	
☐ Rear	
☐ Right	
☐ Left	
☐ Top	
☐ Bottom	

Appendix IV Construction data form

Model: <u>BLN-012TA1</u>		
Part		Technical data
1. Compressor		
	Manufacture:	GMCC
	Type:	EAPM240D57UMT
	Rated capacity:	1990W
	Serial-number:	N/A
2. Condenser		
	Manufacture:	Xinchang Kanglide Refrigeration Co., Ltd
	Type:	KFDLN-012-MR2PN1A1-LQ-2
	Heat exchanger:	High efficiency tank
	Dimension (mm):	388(H)mmX120(D)mm
3. Evaporator		
	Manufacture:	Xinchang Kanglide Refrigeration Co., Ltd
	Type:	KFDLN-012-MR2PN1A1-LQ-1
	Heat exchanger:	Finned-coil heat exchanger
	Dimension (mm):	730(L)mmX750(H)mmX285(D)mm
4. Fan motor		
	Manufacture:	Jiangmen LT motor Co., Ltd.
	Type:	RD100HE
	Fan type:	3 blade
5. Main control board		
	Manufacture:	Foshan Xinchuang Intelligent Co., Ltd
	Type:	AC10I01
	Specification:	220-240V; 50/60Hz

Appendix V Equipment List

No.	Type	Manufacture	Model	Equipment ID	Calibration Due Date
1	R&A performance measuring system	GEI	20kW	-	2021-08-02
2	Temperature and humidity meter	VAISALA	HMD42	H5110021	2021-08-02
3	Platinum resistance	YINUO	Pt100	7430F	2021-05-21
4	Platinum resistance	YINUO	Pt100	7434F	2021-05-21
5	Flowmeter	YOKOGAWA	AXF015G	S5M201965	2021-05-21
6	Flowmeter	YOKOGAWA	AXF040G	S5M805005	2021-05-21
7	Pressure transmitter	MICRO	MPM489	240502	2021-08-03
8	Pressure transmitter	MICRO	MPM489	240503	2021-08-03
9	Water pressure difference transmitter	MICRO	MDM3051	291459	2021-08-03
10	AC source Supply	YANGHONG	YF-3600	-	2022-01-01
11	Water pressure difference transmitter	MICRO	MDM3051	291459	2021-08-03
12	AC source Supply	YANGHONG	YF-3600	-	2022-01-01
13	Temperature and humidity meter	H5110021	HMD42	VAISALA	2021-08-03

-- End of Report --