



Technical Report No.: 64.181.22.03425.02 Rev.00

Date: 2023-09-21

Client: Name: FOSHAN GUANGTENG NEW ENERGY CO.,LTD  
Address: Section 2,Yongfeng Industrial Zone Lunjiao, Shunde, 528308  
Foshan, Guangdong, People's Republic of China  
Contact person: Kelvin Xu

Manufacturer: Name: FOSHAN GUANGTENG NEW ENERGY CO.,LTD  
Address: Section 2,Yongfeng Industrial Zone Lunjiao, Shunde, 528308  
Foshan, Guangdong, People's Republic of China

Factory: Name: FOSHAN GUANGTENG NEW ENERGY CO.,LTD  
Address: Section 2,Yongfeng Industrial Zone Lunjiao, Shunde, 528308  
Foshan, Guangdong, People's Republic of China

Test object: Product: DC INVERTER HEAT PUMP  
Model: GT-SKR040KBDC-M290T, GT-SKR040KBDC-S290T,  
GT-SKR050KBDC-M290T, GT-SKR050KBDC-S290T  
Trade mark: --

Test specification:  EN 14825:2022  
 EN 14511-3:2022  
 EN 14511-4:2022 Clause 4  
 EN 12102-1:2022

Purpose of examination: Test according to the test specification  
 (EU) No 813/2013  
 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 :	GT-SKR040KBDC-M290T, GT-SKR040KBDC-S290T, GT-SKR050KBDC-M290T, GT-SKR050KBDC-S290T
Rated Voltage (V) :	380-415V, 3N~
Rated Frequency (Hz) :	50
Rated Power (W) :	5680W for GT-SKR040KBDC-M290T, GT-SKR040KBDC-S290T, 8500W for GT-SKR050KBDC-M290T, GT-SKR050KBDC-S290T
Rated Current (A) :	9.5A for GT-SKR040KBDC-M290T, GT-SKR040KBDC-S290T, 14.0A for GT-SKR050KBDC-M290T, GT-SKR050KBDC-S290T
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 (kg) :	R290 / 1.30kg for GT-SKR040KBDC-M290T, GT-SKR040KBDC-S290T; 1.60kg for GT-SKR050KBDC-M290T, GT-SKR050KBDC-S290T
Declared parameters :	<input checked="" type="checkbox"/> Average <input type="checkbox"/> Warmer <input type="checkbox"/> Colder
Sound power level dB(A) :	N/A
Series No :	KSN0140Q00201 for GT-SKR040KBDC-M290T, KSN0150Q02476 for GT-SKR050KBDC-M290T

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## 2 Order

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

Date of Purchase Order: 2022-08-15, 2023-06-21

Customer's Reference: FOSHAN GUANGTENG NEW ENERGY CO.,LTD

### 2.2 Test Sample(s)

• Reception date(s): 2022-12-30, 2023-07-07

• Location(s) of reception:

For Energy test:

Guangzhou Customs District Technology Center  
(CNAS accredited laboratory with Registration No.CNAS L2322)

Address: No.3, Desheng East Road, Daliang, Shunde District, Foshan, Guangdong, China

For Noise tests:

China Quality Certification Centre South China Laboratory  
(CNAS accredited laboratory with Registration No.CNAS L4903)

Address: No.11, South of Shenghui Road, Nantou, Zhongshan, Guangdong, China

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

### 2.3 Date(s) of Testing

2022-12-30 to 2023-01-18, 2023-07-07 to 2023-09-10

### 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

Decision rule according to ILAC-G8:09/2019 clause 4.2.1 Binary statement for simple acceptance rule or IEC Guide 115:2023, clause 4.3 Simple acceptance was applied.

Decision rule according to customer's requirements was applied. It is:

Decision rule according to ILAC-G8:09/2019 clause 4.2.2 Binary statement with guard band - guard band length = 95 % extended measurement uncertainty, was applied.

Decision rule (based on ILAC-G8:09/2019 clause 4.2.3 Non-binary statement with guard band, guard band length = 95 % extended measurement uncertainty) for an upper specification limit (A lower limit or specification with an up-per and a lower limit is treated similarly.):

• Compliance with the requirement: If a specification limit is not breached by a measurement result plus the expanded uncertainty with a 95% coverage probability, then compliance with the specification will be stated (e. g. Pass).

• Non-compliance with the requirement: If a specification limit is exceeded by the measurement result minus the expanded uncertainty with a 95% coverage probability, then non-compliance with the specification will be stated (e. g. Fail).

• Inconclusive result: If a measurement result plus/minus the expanded uncertainty with a 95 % coverage probability overlaps the limit it will be stated that it is not possible to state compliance or non-compliance.

There are no statements to conformity or no results with measurand stated in this report, no decision rule has been applied.



3.1 Positive Test Results

See Appendix I

4 Remarks

4.1 General

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 Test History

- 1) These appliances are Air To Water Heat Pump Unit, each one including a whole compression type refrigerant circuit to heat water in another circuit. These appliances were for cooling and heating water function, this report only for heating capacity test.
- 2) The main power is supplied by a 5-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 14825:2022.
- 5) The model GT-SKR040KBDC-S290T is same as GT-SKR040KBDC-M290T except for model's name difference. And the tests are carried out at model GT-SKR040KBDC-M290T.
- 6) The model GT-SKR050KBDC-S290T is same as GT-SKR050KBDC-M290T except for model's name difference. And the tests are carried out at model GT-SKR050KBDC-M290T.
- 7) This test report 64.181.22.03425.02 Rev.00, dated 2023-09-21 supersedes original test report 64.181.22.03425.01 Rev.00, dated 2023-03-17 to include the following changes and/or additions, which were considered technical modifications:
  - a) Adding EN 12102-1:2022 test.
  - b) Adding EN 14511-4:2022 Clause 4 test.

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

Tested by: William Liang, Project Handler  
*printed name, function & signature*

*William Liang*

Approved by: Plum Li, Designated Reviewer  
*printed name, function & signature*



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Appendix I Test results

<b>Table 1.</b>	<b>Heating mode (Low temperature application):</b>						<b>P</b>	
<b>Model</b>	GT-SKR040KBDC-M290T							
<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>								
Condition	Part Load Ratio in %		Outdoor heat exchanger			Indoor heat exchanger		
	Formula	Average climates	Inlet dry (wet) bulb temperature (°C)			Inlet/outlet water temperatures (°C)		
A	$(-7-16)/(T_{designh-16})$	88	-7(-8)			a / 34		
B	$(+2-16)/(T_{designh-16})$	54	2(1)			a / 30		
C	$(+7-16)/(T_{designh-16})$	35	7(6)			a / 27		
D	$(+12-16)/(T_{designh-16})$	15	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	-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 11.814kW, the power is 2.832kW, the COP is 4.17kW/kW.								
<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	1:10:00	1:10:00	1:10:00	1:10:00	1:10:00	1:10:00	
The heat pump defrosts	--	No	No	No	No	No	No	
<b>Electrical Properties</b>								
Voltage	V	398.6	398.8	398.7	398.7	398.5	398.6	
Current input of the unit	A	5.44	2.40	1.93	1.82	5.66	5.44	
Power input of the unit	kW	3.218	1.255	0.992	0.931	3.390	3.218	
Compressor frequency	Hz	80	36	30	30	85	80	

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Appendix I Test results

Test conditions User Side							
Water flow	m <sup>3</sup> /h	2.00	2.00	2.00	2.00	2.00	2.00
Inlet Water temperature	°C	29.53	27.34	25.28**	23.33**	30.95	29.53
Outlet Water temperature	°C	34.00	30.05	28.13**	26.57**	35.25	34.00
Test conditions Source Side							
Barometric pressure	kPa	101.02	101.01	101.01	101.02	101.01	101.02
Air inlet temperature, DB	°C	-6.94	2.07	7.00	11.99	-9.99	-6.94
Air inlet temperature, WB	°C	-7.84	0.96	6.01	10.95	-11.02	-7.84
Summary of the results							
Total heating capacity	kW	10.444	6.368	6.688	7.609	9.997	10.444
Effective power input	kW	3.322	1.359	1.096	1.035	3.494	3.322
Coefficient of performance (COP)	kW/kW	3.14	4.69	6.10	7.35	2.86	3.14
Remark: * In part condition, outlet temperature data is recorded by a full average complete cycle's data. **The inlet and outlet temperatures are been determined according to Cl.11.5.1 of EN 14825:2022.							

Electric power consumptions	Unit	Value
Thermostat-off mode [P <sub>TO</sub> ]	kW	0.029
Standby mode [P <sub>SB</sub> ]	kW	0.010
Crankcase heater [P <sub>CK</sub> ]	kW	0.040
Off mode [P <sub>OFF</sub> ]	kW	0.010

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Appendix I Test results

3.Calculation/conclusion for SCOP:						
Tdesignh(°C):	-10	Tbiv(°C) :	-7			
Pdesignh(kW):	11.806	TOL(°C) :	-10			
Test result A, B, C, D, E, F conditions:						
Condition	Part load	Measured capacity	Measured COP	Cdh	CR	COP at part load
E	11.806	9.997	2.86	0.90	1.00	2.86
F	10.444	10.444	3.14	0.90	1.00	3.14
A	10.444	10.444	3.14	0.90	1.00	3.14
B	6.357	6.368	4.69	0.90	1.00	4.69
C	4.087	6.688	6.10	0.90	0.61	5.74
D	1.816	7.609	7.35	0.90	0.24	5.57
CR: part load divided by capacity;						

Conclusions:	Unit	Value
SCOPon:	kWh/kWh	4.63
SCOP:	kWh/kWh	4.62
Q <sub>H</sub> :	kWh/year	24392
Q <sub>HE</sub> :	kWh/year	5278
η <sub>s,h</sub>	%	181.9
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 2)	--	A+++

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Appendix I Test results

<b>Table 2.</b>	<b>Heating mode (Medium temperature application):</b>						<b>P</b>	
<b>Model</b>	GT-SKR040KBDC-M290T							
<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>								
Condition	Part Load Ratio in %		Outdoor heat exchanger		Indoor heat exchanger			
	Formula	Average climates	Inlet dry (wet) bulb temperature (°C)		Inlet/outlet water temperatures (°C)			
A	$(-7-16)/(T_{designh}-16)$	88	-7(-8)		a / 52			
B	$(+2-16)/(T_{designh}-16)$	54	2(1)		a / 42			
C	$(+7-16)/(T_{designh}-16)$	35	7(6)		a / 36			
D	$(+12-16)/(T_{designh}-16)$	15	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	-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 11.050kW, the power is 3.835kW, the COP is 2.88kW/kW.								
<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	1:10:00	1:10:00	1:10:00	1:10:00	1:10:00	1:10:00	
The heat pump defrosts	--	No	No	No	No	No	No	
<b>Electrical Properties</b>								
Voltage	V	398.4	398.8	398.7	398.7	398.4	398.4	
Current input of the unit	A	6.34	3.07	2.34	1.97	6.93	6.34	
Power input of the unit	kW	4.030	1.669	1.222	1.010	4.407	4.030	
Compressor frequency	Hz	80	36	30	30	85	80	

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Appendix I Test results

Test conditions User Side							
Water flow	m³/h	1.18	1.18	1.18	1.18	1.18	1.18
Inlet Water temperature	°C	44.85	37.56	33.20**	28.81**	48.08	44.85
Outlet Water temperature	°C	51.92	41.99	37.72**	33.91**	55.03*	51.92
Test conditions Source Side							
Barometric pressure	kPa	99.85	99.85	99.85	99.80	99.75	99.85
Air inlet temperature, DB	°C	-7.03	2.09	7.01	12.00	-9.89	-7.03
Air inlet temperature, WB	°C	-8.06	1.18	6.01	10.89	-10.91	-8.06
Summary of the results							
Total heating capacity	kW	9.737	6.119	6.192	6.995	9.580	9.737
Effective power input	kW	4.084	1.722	1.276	1.064	4.460	4.084
Coefficient of performance (COP)	kW/kW	2.38	3.55	4.85	6.58	2.15	2.38
Remark: * In part condition, outlet temperature data is recorded by a full average complete cycle's data. **The inlet and outlet temperatures are been determined according to Cl.11.5.1 of EN 14825:2022.							

Electric power consumptions	Unit	Value
Thermostat-off mode [P <sub>TO</sub> ]	kW	0.029
Standby mode [P <sub>SB</sub> ]	kW	0.010
Crankcase heater [P <sub>CK</sub> ]	kW	0.040
Off mode [P <sub>OFF</sub> ]	kW	0.010

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3.Calculation/conclusion for SCOP:						
Tdesignh(°C):	-10	Tbiv(°C) :	-7			
Pdesignh(kW):	11.007	TOL(°C) :	-10			
Test result A, B, C, D, E, F conditions:						
Condition	Part load	Measured capacity	Measured COP	Cdh	CR	COP at part load
E	11.007	9.580	2.15	0.90	1.00	2.15
F	9.737	9.737	2.38	0.90	1.00	2.38
A	9.737	9.737	2.38	0.90	1.00	2.38
B	5.927	6.119	3.55	0.90	0.97	3.55
C	3.810	6.192	4.85	0.90	0.62	4.57
D	1.693	6.995	6.58	0.90	0.24	5.01
CR: part load divided by capacity;						

Conclusions:	Unit	Value
SCOPon:	kWh/kWh	3.61
SCOP:	kWh/kWh	3.60
QH:	kWh/year	22741
QHE:	kWh/year	6315
$\eta_{s,h}$	%	141.1
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 1)	--	A++

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Appendix I Test results

<b>Table 3.</b>	<b>Heating mode (Low temperature application):</b>							<b>P</b>
<b>Model</b>	GT-SKR050KBDC-M290T							
<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>								
Condition	Part Load Ratio in %			Outdoor heat exchanger		Indoor heat exchanger		
	Formula	Average climates	Inlet dry (wet) bulb temperature (°C)		Inlet/outlet water temperatures (°C)			
A	$(-7-16)/(T_{designh-16})$	88	-7(-8)		a / 34			
B	$(+2-16)/(T_{designh-16})$	54	2(1)		a / 30			
C	$(+7-16)/(T_{designh-16})$	35	7(6)		a / 27			
D	$(+12-16)/(T_{designh-16})$	15	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	-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 17.702kW, the power is 3.752kW, the COP is 4.72kW/kW.								
<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	1:10:00	1:10:00	1:10:00	1:10:00	1:10:00	1:10:00	
The heat pump defrosts	--	No	No	No	No	No	No	
<b>Electrical Properties</b>								
Voltage	V	398.3	398.2	398.0	398.0	398.3	398.3	
Current input of the unit	A	7.13	3.08	2.46	2.36	8.04	7.13	
Power input of the unit	kW	4.447	1.688	1.323	1.123	5.079	4.447	
Compressor frequency	Hz	79	35	30	30	85	79	

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Appendix I Test results

Test conditions User Side							
Water flow	m <sup>3</sup> /h	3.02	3.02	3.02	3.02	3.02	3.02
Inlet Water temperature	°C	30.13	27.68	25.53**	23.30**	31.63	30.13
Outlet Water temperature	°C	34.01	30.00	27.81**	26.00**	35.31	34.01
Test conditions Source Side							
Barometric pressure	kPa	101.02	101.01	101.01	101.02	101.01	101.02
Air inlet temperature, DB	°C	-7.00	2.00	7.01	12.00	-10.00	-7.00
Air inlet temperature, WB	°C	-8.00	1.01	6.01	11.00	-11.00	-8.00
Summary of the results							
Total heating capacity	kW	13.449	8.189	8.078	9.523	12.993	13.449
Effective power input	kW	4.535	1.775	1.411	1.211	5.166	4.535
Coefficient of performance (COP)	kW/kW	2.97	4.61	5.73	7.87	2.51	2.97
Remark: * In part condition, outlet temperature data is recorded by a full average complete cycle's data. **The inlet and outlet temperatures are been determined according to Cl.11.5.1 of EN 14825:2022.							

Electric power consumptions	Unit	Value
Thermostat-off mode [P <sub>TO</sub> ]	kW	0.029
Standby mode [P <sub>SB</sub> ]	kW	0.010
Crankcase heater [P <sub>CK</sub> ]	kW	0.040
Off mode [P <sub>OFF</sub> ]	kW	0.010

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3.Calculation/conclusion for SCOP:						
Tdesignh(°C):	-10	Tbiv(°C) :	-7			
Pdesignh(kW):	15.204	TOL(°C) :	-10			
Test result A, B, C, D, E, F conditions:						
Condition	Part load	Measured capacity	Measured COP	Cdh	CR	COP at part load
E	15.204	12.993	2.51	0.90	1.00	2.51
F	13.449	13.449	2.97	0.90	1.00	2.97
A	13.449	13.449	2.97	0.90	1.00	2.97
B	8.187	8.189	4.61	0.90	1.00	4.61
C	5.263	8.078	5.73	0.90	0.65	5.44
D	2.339	9.523	7.87	0.90	0.25	6.02
CR: part load divided by capacity;						

Conclusions:	Unit	Value
SCOPon:	kWh/kWh	4.51
SCOP:	kWh/kWh	4.50
QH:	kWh/year	31411
QHE:	kWh/year	6973
$\eta_{s,h}$	%	177.2
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 2)	--	A+++

Appendix I Test results

<b>Table 4.</b>	<b>Heating mode (Medium temperature application):</b>							<b>P</b>
<b>Model</b>	GT-SKR050KBDC-M290T							
<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>								
Condition	Part Load Ratio in %		Outdoor heat exchanger		Indoor heat exchanger			
	Formula	Average climates	Inlet dry (wet) bulb temperature (°C)		Inlet/outlet water temperatures (°C)			
A	$(-7-16)/(T_{designh}-16)$	88	-7(-8)		a / 52			
B	$(+2-16)/(T_{designh}-16)$	54	2(1)		a / 42			
C	$(+7-16)/(T_{designh}-16)$	35	7(6)		a / 36			
D	$(+12-16)/(T_{designh}-16)$	15	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	-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 12.669kW, the power is 4.944kW, the COP is 2.56kW/kW.								
<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	1:10:00	1:10:00	1:10:00	1:10:00	1:10:00	1:10:00	
The heat pump defrosts	--	No	No	No	No	No	No	
<b>Electrical Properties</b>								
Voltage	V	398.2	398.2	398.2	398.1	398.3	398.2	
Current input of the unit	A	8.42	3.41	2.84	2.51	9.15	8.42	
Power input of the unit	kW	5.343	1.870	1.533	1.346	5.842	5.343	
Compressor frequency	Hz	76	33	30	30	82	76	

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Appendix I Test results

Test conditions User Side							
Water flow	m³/h	1.35	1.35	1.35	1.35	1.35	1.35
Inlet Water temperature	°C	44.57	37.47	33.09	28.70	47.14	44.57
Outlet Water temperature	°C	52.02	42.00	38.30	34.53	55.01*	52.02
Test conditions Source Side							
Barometric pressure	kPa	99.85	99.85	99.85	99.80	99.75	99.85
Air inlet temperature, DB	°C	-7.00	2.01	7.02	12.00	-10.00	-7.00
Air inlet temperature, WB	°C	-8.00	1.01	6.01	11.00	-11.00	-8.00
Summary of the results							
Total heating capacity	kW	11.770	7.182	8.258	9.228	12.447	11.770
Effective power input	kW	5.433	1.961	1.623	1.437	5.933	5.433
Coefficient of performance (COP)	kW/kW	2.17	3.66	5.09	6.42	2.10	2.17
Remark: * In part condition, outlet temperature data is recorded by a full average complete cycle's data. **The inlet and outlet temperatures are been determined according to Cl.11.5.1 of EN 14825:2022.							

Electric power consumptions	Unit	Value
Thermostat-off mode [P <sub>TO</sub> ]	kW	0.029
Standby mode [P <sub>SB</sub> ]	kW	0.010
Crankcase heater [P <sub>CK</sub> ]	kW	0.040
Off mode [P <sub>OFF</sub> ]	kW	0.010

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Appendix I Test results

3.Calculation/conclusion for SCOP:						
Tdesignh(°C):	-10	Tbiv(°C) :	-7			
Pdesignh(kW):	13.305	TOL(°C) :	-10			
Test result A, B, C, D, E, F conditions:						
Condition	Part load	Measured capacity	Measured COP	Cdh	CR	COP at part load
E	13.305	12.447	2.10	0.90	1.00	2.10
F	11.770	11.770	2.17	0.90	1.00	2.17
A	11.770	11.770	2.17	0.90	1.00	2.17
B	7.164	7.182	3.66	0.90	1.00	3.66
C	4.606	8.258	5.09	0.90	0.56	4.71
D	2.047	9.228	6.42	0.90	0.22	4.76
CR: part load divided by capacity;						

Conclusions:	Unit	Value
SCOPon:	kWh/kWh	3.62
SCOP:	kWh/kWh	3.62
QH:	kWh/year	27489
QHE:	kWh/year	7603
$\eta_{s,h}$	%	141.6
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 1)	--	A++

Appendix I Test results

Table 5a.	Sound power level measurement (Low temperature application)		P
Model	GT-SKR040KBDC-M290T		
	Product type :	Air to Water	
	Outdoor heat exchanger, Air temperature DB/WB (°C):	7.0 / 6.0	
	Indoor heat exchanger, Water inlet/outlet temperature (°C):	30.0 / 35.0	
	Voltage (V):	400	
	Frequency (Hz):	50	
	Working condition class :	Class A	
	Acoustical environment :	Hemi-anechoic room	
	Windshield type :	Sponge	
	Measured position amount :	14	
	Water flow (m³/h):	2.00	
Measured quantity	L <sub>WA,indoors</sub> (dB(A))	L <sub>WA,outdoors</sub> (dB(A))	Remark
Sound pressure level $\bar{L}_{p(ST)}$ ****	--	51	--
Measurement distance d *	--	1.0m	--
Sound power level L <sub>WA</sub> ****	--	65	--
Setting of controls: according to user manual. Duct connection:-- Rounding to: *) 1 decimal places; **) 2 decimal places; ***) 3 decimal places; ****) nearest integer Fan speed: 850 r/min, compressor frequency: 70Hz.			

Appendix I Test results

Table 5b.	Sound power level measurement (Medium temperature application)		P
Model	GT-SKR040KBDC-M290T		
	Product type :	Air to Water	
	Outdoor heat exchanger, Air temperature DB/WB (°C):	7.0 / 6.0	
	Indoor heat exchanger, Water inlet/outlet temperature (°C):	47.0 / 55.0	
	Voltage (V):	400	
	Frequency (Hz):	50	
	Working condition class :	Class A	
	Acoustical environment :	Hemi-anechoic room	
	Windshield type :	Sponge	
	Measured position amount :	14	
	Water flow (m³/h):	1.18	
Measured quantity	L <sub>WA,indoors</sub> (dB(A))	L <sub>WA,outdoors</sub> (dB(A))	Remark
Sound pressure level $\bar{L}_{p(ST)}$ ****	--	49	--
Measurement distance d *	--	1.0m	--
Sound power level L <sub>WA</sub> ****	--	64	--
Setting of controls: according to user manual.			
Duct connection:--			
Rounding to: *) 1 decimal places; **) 2 decimal places; ***) 3 decimal places; ****) nearest integer			
Fan speed: 850 r/min, compressor frequency: 68Hz.			

Appendix I Test results

Table 6a.	Sound power level measurement (Low temperature application)		P
Model	GT-SKR050KBDC-M290T		
	Product type :	Air to Water	
	Outdoor heat exchanger, Air temperature DB/WB (°C):	7.0 / 6.0	
	Indoor heat exchanger, Water inlet/outlet temperature (°C):	30.0 / 35.0	
	Voltage (V):	400	
	Frequency (Hz):	50	
	Working condition class :	Class A	
	Acoustical environment :	Hemi-anechoic room	
	Windshield type :	Sponge	
	Measured position amount :	14	
	Water flow (m³/h):	3.02	
Measured quantity	L <sub>WA,indoors</sub> (dB(A))	L <sub>WA,outdoors</sub> (dB(A))	Remark
Sound pressure level $\bar{L}_{p(ST)}$ ****	--	57	--
Measurement distance d *	--	1.0m	--
Sound power level L <sub>WA</sub> ****	--	71	--
Setting of controls: according to user manual. Duct connection:-- Rounding to: *) 1 decimal places; **) 2 decimal places; ***) 3 decimal places; ****) nearest integer Fan speed: 850 r/min, compressor frequency: 66Hz.			

Appendix I Test results

Table 6b.	Sound power level measurement (Medium temperature application)	P	
Model	GT-SKR050KBDC-M290T		
	Product type :	Air to Water	
	Outdoor heat exchanger, Air temperature DB/WB (°C):	7.0 / 6.0	
	Indoor heat exchanger, Water inlet/outlet temperature (°C):	47.0 / 55.0	
	Voltage (V):	400	
	Frequency (Hz):	50	
	Working condition class :	Class A	
	Acoustical environment :	Hemi-anechoic room	
	Windshield type :	Sponge	
	Measured position amount :	14	
	Water flow (m³/h):	1.35	
Measured quantity	L <sub>WA,indoors</sub> (dB(A))	L <sub>WA,outdoors</sub> (dB(A))	Remark
Sound pressure level $\bar{L}_{p(ST)}$ ****	--	57	--
Measurement distance d *	--	1.0m	--
Sound power level L <sub>WA</sub> ****	--	72	--
Setting of controls: according to user manual.			
Duct connection:--			
Rounding to: *) 1 decimal places; **) 2 decimal places; ***) 3 decimal places; ****) nearest integer			
Fan speed: 850 r/min, compressor frequency: 59Hz.			

**Appendix I Test results**

<b>Table 7.</b>	<b>Clause 4 of EN 14511-4:2022</b>	<b>P</b>
<b>Model:</b>	<b>GT-SKR040KBDC-M290T</b>	
<b>TEST 1</b>	<b>STARTING TEST (§4.2.1.2 Table 3)</b>	
Requirement: The "lower" starting operating conditions declared by the manufacturer for the heating mode- i.e. Tair= -25.01°C, T in water = 9.76°C, Flow rate 1.04m³/h have been set and obtained. At those conditions, the machine was switched on.		
Observation/ Evaluation: It started without any problem and worked for 30 minutes without showing any warning or alarm. During the test the machine operated in auto mode. No damage was recorded on the machine during and after the test.		
Test Response: Pass		

<b>TEST 2</b>	<b>OPERATING TEST (§4.2.1.2 Table 3)</b>	
Requirement: From the machine "lower" starting conditions - i.e. - the machine was brought to the lower operating conditions declared by the manufacturer for the heating mode- i.e. Tair= -25.06°C, T in water = 70.18 °C, Flow rate 1.04m³/h. Once these conditions were obtained, the machine was let operate for over 1 hour in auto mode.		
Observation/ Evaluation: During the test, no waring or alarm were showed. No damage was recorded on the machine during and after the test.		
Test Response: Pass		

<b>TEST 3</b>	<b>SHUTTING OFF WATER FLOW (§ 4.5)</b>	
Requirement: The water flow rate was shuted off through manual and automatic valves of the test rig. The machine switched off and only the flow switch Protection appeared on the user interface of indoor unit.		
Observation/ Evaluation: Perform error reset operation, once the water flow rate was restored, the machine restarted automatically and worked for 30 minutes normally. No damage was recorded on the machine during and after the test.		
Test Response: Pass		

<b>TEST 4</b>	<b>SHUTTING OFF AIR FLOW (§ 4.5)</b>	
Requirement: The air flow rate was shuted off through a plastic sheet and a panel. The machine never turned off. It continued to operate with continuous frosting and defrosting cycles. After more than half an hour, the air flow rate was restored and the machine started to operate normally.		
Observation/ Evaluation: During the test, no waring or alarm were showed. No damage was recorded on the machine during and after the test.		
Test Response: Pass		

<b>TEST 5</b>	<b>COMPLETE POWER SUPPLY FAILURE (§ 4.6)</b>	
Requirement: The power supply was cut off for about 5 seconds.		
Observation/ Evaluation: The unit restarted automatically within about 3 minutes after the power supply was reactivated.		
Test Response: Pass		

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**Appendix I Test results**

<b>Table 8.</b>	<b>Clause 4 of EN 14511-4:2022</b>	<b>P</b>
<b>Model:</b>	<b>GT-SKR050KBDC-M290T</b>	
<b>TEST 1</b>	<b>STARTING TEST (§4.2.1.2 Table 3)</b>	
Requirement: The "lower" starting operating conditions declared by the manufacturer for the heating mode- i.e. T <sub>air</sub> = -25.11°C, T in water = 9.47°C, Flow rate 1.25m <sup>3</sup> /h have been set and obtained. At those conditions, the machine was switched on.		
Observation/ Evaluation: It started without any problem and worked for 30 minutes without showing any warning or alarm. During the test the machine operated in auto mode. No damage was recorded on the machine during and after the test.		
Test Response: Pass		

<b>TEST 2</b>	<b>OPERATING TEST (§4.2.1.2 Table 3)</b>	
Requirement: From the machine "lower" starting conditions - i.e. - the machine was brought to the lower operating conditions declared by the manufacturer for the heating mode- i.e. T <sub>air</sub> = -25.13°C, T in water = 70.11 °C, Flow rate 1.25m <sup>3</sup> /h. Once these conditions were obtained, the machine was let operate for over 1 hour in auto mode.		
Observation/ Evaluation: During the test, no warning or alarm were showed. No damage was recorded on the machine during and after the test.		
Test Response: Pass		

<b>TEST 3</b>	<b>SHUTTING OFF WATER FLOW (§ 4.5)</b>	
Requirement: The water flow rate was shutted off through manual and automatic valves of the test rig. The machine switched off and only the flow switch Protection appeared on the user interface of indoor unit.		
Observation/ Evaluation: Perform error reset operation, once the water flow rate was restored, the machine restarted automatically and worked for 30 minutes normally. No damage was recorded on the machine during and after the test.		
Test Response: Pass		

<b>TEST 4</b>	<b>SHUTTING OFF AIR FLOW (§ 4.5)</b>	
Requirement: The air flow rate was shutted off through a plastic sheet and a panel. The machine never turned off. It continued to operate with continuous frosting and defrosting cycles. After more than half an hour, the air flow rate was restored and the machine started to operate normally.		
Observation/ Evaluation: During the test, no warning or alarm were showed. No damage was recorded on the machine during and after the test.		
Test Response: Pass		

<b>TEST 5</b>	<b>COMPLETE POWER SUPPLY FAILURE (§ 4.6)</b>	
Requirement: The power supply was cut off for about 5 seconds.		
Observation/ Evaluation: The unit restarted automatically within about 3 minutes after the power supply was reactivated.		
Test Response: Pass		

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Appendix II Marking plate

Nameplate	
<b>Model: <u>GT-SKR040KBDC-M290T</u></b>	
<b>DC INVERTER HEAT PUMP</b>	
Model No.	GT-SKR040KBDC-M290T
*Heating Capacity Range	5.25~15.00 kW
*Heating input Range	1.28~3.63 kW
*Heating COP Range	3.00~5.00 kW/kW
**Heating Capacity Range	5.03~14.29 kW
**Heating input Range	1.79~5.09 kW
**Heating COP Range	2.02~3.41 kW/kW
Power supply	380-415V/3N~/50Hz
Rated current	9.5 A
Rated power input	5680 W
Max exhaust pressure	3.1MPa
Max suction pressure	0.9MPa
Maximum allowable pressure	3.1MPa
Refrigerant	 R290/1.30kg
Max water temperature	65°C
Degree of protection	IPX4
Shockproof level	I
Earth requirement	≤0.1Ω
Net weight	99 kg
Dimension	1110*470*1010mm
Water connection	1 Inch
Noise level	≤67dB(A)
Working ambient temperature	-25°C~43°C
*Heating working condition: Inlet water temperature 30°C, Outlet water temperature 35°C Dry bulb temperature 7°C, Wet bulb temperature 6°C. **Heating working condition: Inlet water temperature 47°C, Outlet water temperature 55°C Dry bulb temperature 7°C, Wet bulb temperature 6°C.	
Foshan Guangteng New Energy Co., Ltd. Section 2, Yongfeng Industrial Zone, Lunjiao, Shunde, Foshan, Guangdong, China   	
Remark: The model GT-SKR040KBDC-S290T is same as GT-SKR040KBDC-M290T except for model's name difference.	

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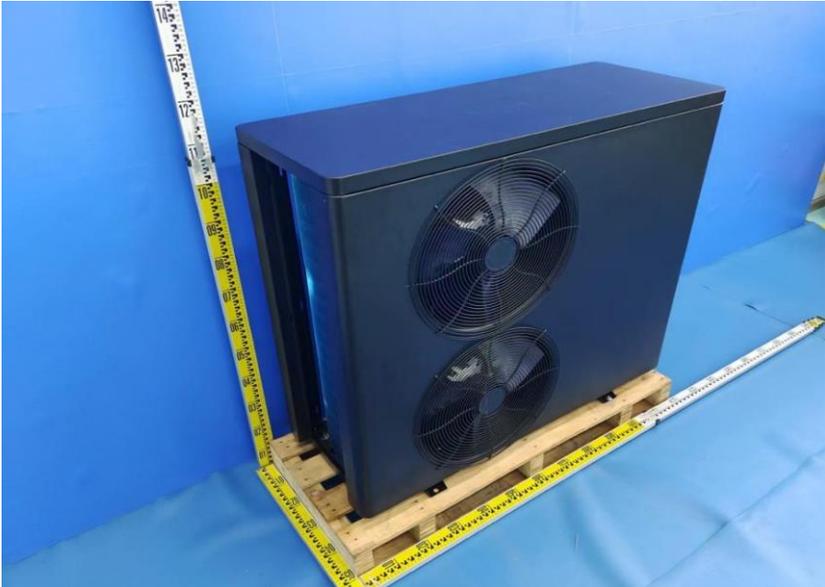
Appendix II Marking plate

Nameplate	
<b>Model: <u>GT-SKR050KBDC-M290T</u></b>	
<b>DC INVERTER HEAT PUMP</b>	
Model No.	GT-SKR050KBDC-M290T
*Heating Capacity Range	8.80~21.20 kW
*Heating input Range	1.99~4.80 kW
*Heating COP Range	3.10~5.30 kW/kW
**Heating Capacity Range	7.94~19.13 kW
**Heating input Range	2.71~6.53 kW
**Heating COP Range	2.05~3.52 kW/kW
Power supply	380-415V/3N~/50Hz
Rated current	14 A
Rated power input	8.5 kW
Max exhaust pressure	3.1MPa
Max suction pressure	0.9MPa
Maximum allowable pressure	3.1MPa
Refrigerant	<div style="display: flex; align-items: center;">            R290/1.60kg         </div>
Max water temperature	65°C
Degree of protection	IPX4
Shockproof level	I
Earth requirement	≤0.1Ω
Net weight	135 kg
Dimension	1160*470*1280mm
Water connection	1 Inch
Noise level	≤73dB(A)
Working ambient temperature	-25°C~43°C
*Heating working condition: Inlet water temperature 30°C, Outlet water temperature 35°C Dry bulb temperature 7°C, Wet bulb temperature 6°C. **Heating working condition: Inlet water temperature 47°C, Outlet water temperature 55°C Dry bulb temperature 7°C, Wet bulb temperature 6°C.	
Foshan Guangteng New Energy Co., Ltd. Section 2, Yongfeng Industrial Zone, Lunjiao, Shunde, Foshan, Guangdong, China	
  	

Remark: The model GT-SKR050KBDC-S290T is same as GT-SKR050KBDC-M290T except for model's name difference.

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Appendix III photo documentation

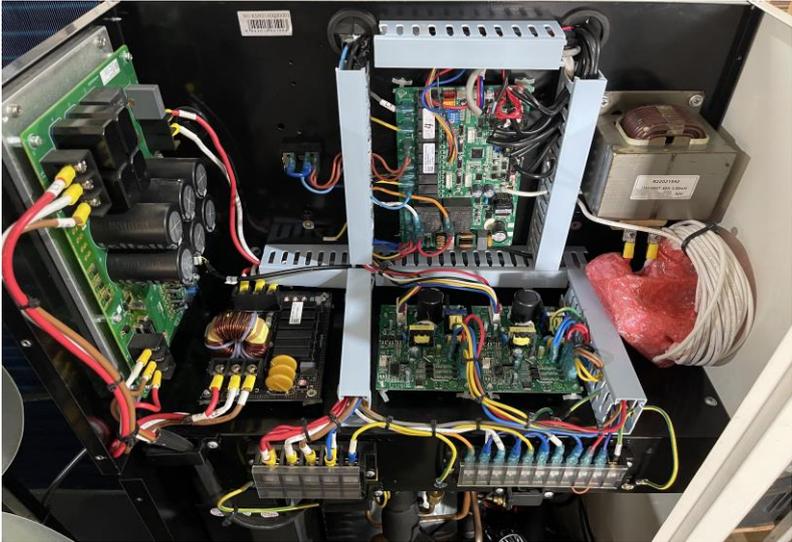
Details of:	Overall view for GT-SKR040KBDC-M290T
<p><b>View:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> General</li> <li><input type="checkbox"/> Front</li> <li><input type="checkbox"/> Rear</li> <li><input type="checkbox"/> Right</li> <li><input type="checkbox"/> Left</li> <li><input type="checkbox"/> Top</li> <li><input type="checkbox"/> Bottom</li> </ul>	

Details of:	Compressor for GT-SKR040KBDC-M290T
<p><b>View:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> General</li> <li><input type="checkbox"/> Front</li> <li><input type="checkbox"/> Rear</li> <li><input type="checkbox"/> Right</li> <li><input type="checkbox"/> Left</li> <li><input type="checkbox"/> Top</li> <li><input type="checkbox"/> Bottom</li> </ul>	

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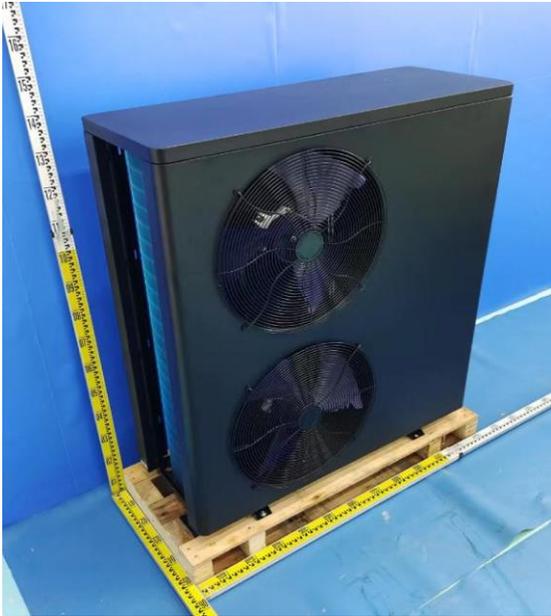
Appendix III photo documentation

Details of:	Fan Motor for GT-SKR040KBDC-M290T
<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>	 <p>The image shows a white fan motor with a detailed label. The label includes the model number RD34HE1, specifications for DC310V 34W, 0.18A E-grade, and 860r/min speed. It lists terminal colors and their corresponding voltages: Blue (BU) for FG, Red (RD) for Vm DC310V, White (WH) for Vcc DC15V, Yellow (YE) for Vsp DC0-6.5V, and Black (BK) for GND. The label also features a QR code, RoHS compliance information (000152, 20220813), and the manufacturer's name: Jiangmen LT Motor Co., Ltd.</p>

Details of:	Main Control Board for GT-SKR040KBDC-M290T
<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>	 <p>The image displays the internal main control board of the device. It features a complex arrangement of electronic components including a power supply unit with capacitors, a central microcontroller board, and various connectors. Numerous colored wires are connected to the board, and a transformer is visible on the right side. The board is mounted within a metal chassis.</p>

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Appendix III photo documentation

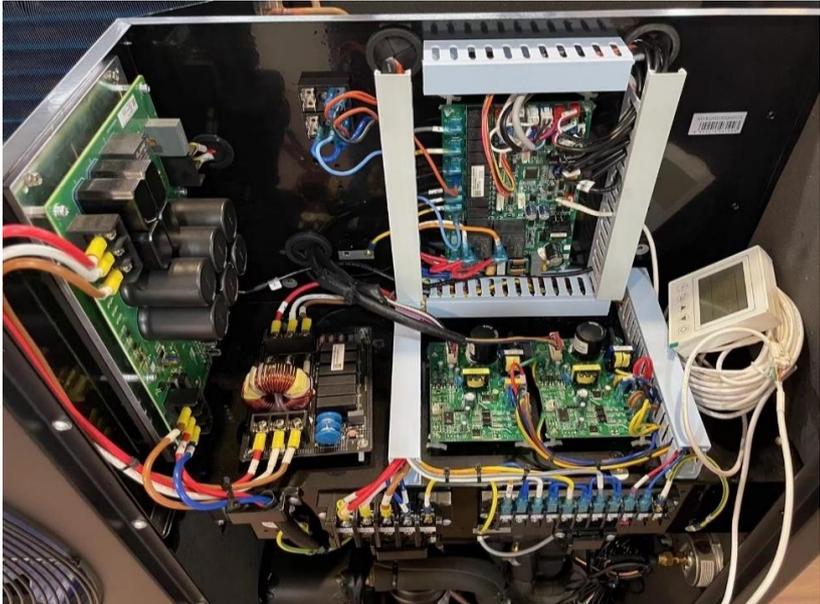
Details of:	Overall view for GT-SKR050KBDC-M290T
<p><b>View:</b></p> <p><input type="checkbox"/> General</p> <p><input type="checkbox"/> Front</p> <p><input type="checkbox"/> Rear</p> <p><input type="checkbox"/> Right</p> <p><input type="checkbox"/> Left</p> <p><input type="checkbox"/> Top</p> <p><input type="checkbox"/> Bottom</p>	

Details of:	Compressor for GT-SKR050KBDC-M290T
<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 documentation

Details of:	Fan Motor for GT-SKR050KBDC-M290T
<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>	 <p>The photograph shows a white label for a fan motor. The text on the label includes: 'RD50HK1 空气调节器用塑封无刷直流电动机 (FAN MOTOR FOR AIR CONDITIONER)', 'DC310V 50W', '0.22A E级(CL)', '8极(P) 850r/min', and '转向 (ROT.)'. It also lists terminal colors: '蓝 BLU FG', '红 RED Vm DC310V', '白 WHI Vcc DC15V', '黄 YEL Vsp DC0-6.5V', and '黑 BLA GND'. The manufacturer is '江门市力丰电机有限公司 (Jiangmen LT Motor Co., Ltd)'. There is a QR code and a RoHS compliance code '000279 20220905'.</p>

Details of:	Main Control Board for GT-SKR050KBDC-M290T
<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>	 <p>The photograph shows the internal components of a main control board. It features a green printed circuit board (PCB) populated with various electronic components, including integrated circuits, capacitors, and resistors. There are several multi-pin connectors and a terminal block with numerous colored wires (red, blue, yellow, black) connected to it. A small digital display or sensor module is visible on the right side of the board.</p>

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Appendix IV Construction data form

Model: <b>GT-SKR040KBDC-M290T</b>		
Part		Technical data
1. Compressor		
	Manufacture:	SHANGHAI HIGHLY ELECTRICAL APPLIANCES CO., LTD.
	Type:	WHP13300PSDPC8FQ
	Rated capacity:	13300W
	Serial-number:	W6PN5H06376X
	Specification:	DC143.5V; R290
2. Condenser		
	Manufacture:	SWEP TECHNOLOGY (SUZHOU) CO., LTD
	Type:	F85Hx30/1P-NSC-M
	Heat exchanger:	Plate heat exchanger
	Dimension(mm):	526x40.8x119
3. Evaporator		
	Manufacture:	Foshan Huize Heat Exchange Equipment Co., Ltd.
	Type:	Hydrophilic aluminum
	Heat exchanger:	Finned-coil heat exchanger
	Dimension(mm):	352*715*950
4. Fan motor		
	Manufacture:	Jiangmen LT Motor Co., LTD
	Type:	RD34HE1
	Fan type:	3 blade
	Specification:	DC310V; 34W
5. Main control board		
	Manufacture:	SHENZHEN MEGMEET ELECTRICAL CO., LTD.
	Type:	HiPlus12000FC-GT35A
	Specification:	AC380-415V; 50Hz

Appendix IV Construction data form

Model: <b>GT-SKR050KBDC-M290T</b>		
Part		Technical data
1. Compressor		
	Manufacture:	SHANGHAI HIGHLY ELECTRICAL APPLIANCES CO., LTD.
	Type:	WHP32900VSKTQ9JK
	Rated capacity:	18160W
	Serial-number:	W82N1E02NMNJ
	Specification:	DC221V; R290
2. Condenser		
	Manufacture:	SWEP TECHNOLOGY (SUZHOU) CO., LTD
	Type:	F85Hx50/1P-NSC-M
	Heat exchanger:	Plate heat exchanger
	Dimension(mm):	526x40.8x119
3. Evaporator		
	Manufacture:	Foshan Huize Heat Exchange Equipment Co., Ltd.
	Type:	Hydrophilic aluminum
	Heat exchanger:	Finned-coil heat exchanger
	Dimension(mm):	400*717*1200
4. Fan motor		
	Manufacture:	Jiangmen LT Motor Co., LTD
	Type:	RD50HK1
	Fan type:	3 blade
	Specification:	DC310V; 50W
5. Main control board		
	Manufacture:	SHENZHEN MEGMEET ELECTRICAL CO., LTD.
	Type:	HiPlus12000FC-GT35A
	Specification:	AC380-415V; 50Hz



Appendix V Equipment List

No.	Type	Manufacture	Model	Equipment ID	Calibration Due Date
1	Heat pump energy efficiency testing system	PINXIN	10HP	2017J00001	2023-11-24
2	Electromagnetic flowmeter	KROHNE	OPTIFLUX4100C	H17221264	2023-12-21
3	20 Channel noise and vibration testing system	RION	SA-02M	CQCSC-BE-0026	2024-01-11
4	Nosie Testing Lab	Beijing Zhongjia Zhirui Technology Co., LTD	ZR-02	CQCSC-BE-0026	2023-11-22
5	Nosie Testing Lab (environmental control system)	Beijing Zhongjia Zhirui Technology Co., LTD	ZR-02	CQCSC-BE-0026	2023-11-22

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