Product Service

Technical Report No.: 64.181.22.01878.01 Rev.00

Date: 2022-07-11

Client:	Report holder's name:	ThermoFLUX d.o.o
	Report holder's Address:	Bage 3, 70101 Jajce, Bosnia and Herzegovina
	Contact person of applicant:	Amel Kopić
	Manufacturer's name:	ThermoFLUX d.o.o
	Manufacturer's address:	Bage 3, 70101 Jajce, Bosnia and Herzegovina
Test object:	Product:	EVI DC Inverter Split Air Source Heat Pumps
	Model:	Outdoor unit: TF17DC SPLIT; Indoor unit: TF17DC SPLIT
	Trade name:	ThermoFLUX
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 :	Outdoor unit: TF17DC SPLIT; Indoor unit: TF17DC SPLIT
Rated Voltage (V) :	380-415，3N~
Rated Frequency (Hz) :	50
Rated Power (W) :	5500
Rated Current (A) :	11.54
Protection Class :	Class I
Protection Against Moisture :	Indoor unit: IPX0; outdoor unit: IPX4
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 /3800g
Declared parameters :	☑ Average ☐ Warmer ☐ Colder
Sound power level dB(A) :	N/A
Series No :	KRZJ03A20500600447

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2 Order

2.1 Date of Purchase Order, Customer's Reference

2021-02-01, 2021-11-25 ThermoFLUX d.o.o

2.2 Test Sample(s)

- Reception date(s): 2021-03-01
- 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

2021-03-01 to 2021-03-07

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

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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 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 14825:2018.
5) This test report 64.181.22.01878.01 Rev.00, dated 2022-07-11 is base on original test report 64.181.21.01923.01 Rev.00, dated 2021-04-19 to include the following changes and/or additions:

   a) Changing report holder name, address of report holder, manufacture name, address of manufacture, trade name, model name and exterior.

   b) After evaluating, no additional test was needed.

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TÜV SÜD Group

Tested by: William Liang, Project Handler

printed name, function & signature

Approved by: Plum Li, Designated Reviewer

printed name, function & signature

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Appendix I Test results

Table 1.	Heating mode(Low temperature application):						P
Model	Outdoor unit: TF17DC SPLIT; Indoor unit: TF17DC SPLIT						
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)/(Tdesignh-16)	88	N/A	N/A	-7(-8)	a / 34
B	(+2-16)/ (Tdesignh-16)	54	N/A	N/A	2(1)	a / 30
C	(+7-16)/(Tdesignh-16)	35	N/A	N/A	7(6)	a / 27
D	(+12-16)/(Tdesignh-16)	15	N/A	N/A	12(11)	a / 24
E	(TOL-16)/ (Tdesignh-16)				TOL	a / 35.3
F	(Tbivalent-16)/(Tdesignh-16)				Tbiv	a / 34
G	(-15-16)/(Tdesignh-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	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	--	1	0	0	0	1	1
Barometric pressure	kPa	101.02	101.01	101.01	101.02	101.01	101.02
Voltage	V	398.7	402.3	408.8	401.7	396.8	398.7
Current input of the unit	A	8.79	3.54	3.20	2.87	8.90	8.79
Power input of the unit	kW	3.834	1.506	1.249	1.040	3.890	3.834
Test conditions **indoor** unit							
Inlet Water temperature, DB	°C	27.78	26.82	23.21	19.69	29.55	27.78
Outlet Water temperature, DB	°C	33.00*	30.08	27.02	24.03	34.19*	33.00*

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Appendix I Test results

Test conditions **outdoor** unit							
Air **inlet** temperature, DB	°C	-6.92	2.03	7.07	12.01	-9.83	-6.92
Air **inlet** temperature, WB	°C	-8.74	1.01	5.92	11.01	-11.37	-8.74
Summary of the results							
Total heating capacity	kW	10.936	6.729	7.869	9.055	9.781	10.936
Effective power input	kW	3.815	1.488	1.231	1.022	3.871	3.815
Coefficient of performance (COP)	--	2.87	4.52	6.39	8.86	2.53	2.87
Compressor frequency	Hz	70	30	30	30	70	70
Water flow	m³/h	1.80	1.80	1.80	1.80	1.80	1.80
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)	12.363	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	12.363	9.781	2.53	0.00	1.00	2.53
F	10.936	10.936	2.87	0.00	1.00	2.87
A	10.936	10.936	2.87	0.00	1.00	2.87
B	6.657	6.729	4.52	0.00	0.99	4.52
C	4.279	7.869	6.39	0.99	0.54	6.34
D	1.902	9.055	8.86	0.99	0.21	8.54
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	0.016
Standby mode [P_{SB}]	kW	0.016
Crankcase heater [P_{CK}]	kW	0.047
Off mode [P_{OFF}]	kW	0.016

Conclusions:	Unit	Value
SCOPon:	kWh/kWh	4.70
SCOP:	kWh/kWh	4.69
Q_H:	kWh/year	25541
Q_{HE}:	kWh/year	5441
$\eta_{s,h}$	%	184.8
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 2)	--	A+++

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Appendix I Test results

Table 2.	Heating mode(Medium temperature application):						P
Model	Outdoor unit: TF17DC SPLIT; Indoor unit: TF17DC SPLIT						
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)/(Tdesignh-16)	88	N/A	N/A	-7(-8)	a / 52
B	(+2-16)/ (Tdesignh-16)	54	N/A	N/A	2(1)	a / 42
C	(+7-16)/(Tdesignh-16)	35	N/A	N/A	7(6)	a / 36
D	(+12-16)/(Tdesignh-16)	15	N/A	N/A	12(11)	a / 30
E	(TOL-16)/ (Tdesignh-16)				TOL	a / 55.3
F	(Tbivalent-16)/(Tdesignh-16)				Tbiv	a / 52
G	(-15-16)/(Tdesignh-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	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	--	1	0	0	0	1	1
Barometric pressure	kPa	99.85	99.85	99.85	99.80	99.75	99.85
Voltage	V	405.4	398.7	400.9	397.9	396.0	405.4
Current input of the unit	A	11.46	5.12	3.97	3.33	11.73	11.46
Power input of the unit	kW	5.178	2.058	1.560	1.272	5.370	5.178
Test conditions **indoor** unit							
Inlet Water temperature, DB	°C	45.85	38.61	32.31	25.78	49.19	45.85
Outlet Water temperature, DB	°C	50.99*	42.16	35.98	30.03	54.02*	50.99*

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Appendix I Test results

Test conditions **outdoor** unit							
Air **inlet** temperature, DB	°C	-6.89	2.33	7.56	12.00	-9.84	-6.89
Air **inlet** temperature, WB	°C	-8.54	1.01	6.00	11.00	-11.29	-8.54
Summary of the results							
Total heating capacity	kW	10.784	7.384	7.568	8.786	10.099	10.784
Effective power input	kW	5.157	2.037	1.539	1.251	5.349	5.157
Coefficient of performance (COP)	--	2.09	3.63	4.92	7.03	1.89	2.09
Compressor frequency	Hz	70	30	30	30	70	70
Water flow	m³/h	1.83	1.83	1.83	1.83	1.83	1.83
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)	12.190	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	12.190	10.099	1.89	0.00	1.00	1.89
F	10.784	10.784	2.09	0.00	1.00	2.09
A	10.784	10.784	2.09	0.00	1.00	2.09
B	6.564	7.384	3.63	0.99	0.89	3.62
C	4.220	7.568	4.92	0.99	0.56	4.88
D	1.875	8.786	7.03	0.99	0.21	6.78

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	0.016
Standby mode [P_{SB}]	kW	0.016
Crankcase heater [P_{CK}]	kW	0.047
Off mode [P_{OFF}]	kW	0.016

Conclusions:	Unit	Value
SCOPon:	kWh/kWh	3.68
SCOP:	kWh/kWh	3.67
Q_H:	kWh/year	25185
Q_{HE}:	kWh/year	6859
$\eta_{s,h}$	%	143.9
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 1)	--	A++

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Appendix II Marking plate

Nameplate

Model: Outdoor unit: TF17DC SPLIT

ThermoFLUX CE

EVI DC Inverter Split Air Source Heat Pumps

	Outdoor Unit
Model	TF17DC SPLIT
Power Supply	380 - 415V/3N~, 50Hz
WaterProof Level	IPX4
Electric Shock Proof Grade	I
Heating Capacity Min./Max.	7.73/16.8kW
Heating Input Power Min./Max.	1.38/3.75kW
Cooling Capacity Min./Max.	5.09/11.05kW
Cooling Input Power Min./Max.	1.44/4.65kW
Water Flow	2.9m³/h
Operation pressure(low side)	1.5Mpa
Operation pressure(high side)	4.4Mpa
Maximum allowable pressure	4.4Mpa
Rated Power Input	5.5kW
Rated Current	11.54A
Refigerant/Weight	R410A/3800g
Net Weight	109kg
Date: /NO.	See bar code

ThermoFLUX d.o.o
Bage 3, 70101 Jajce, Bosnia and Herzegovina
www.thermoflux.ba

Appendix II Marking plate

Nameplate

Model: Indoor unit: TF17DC SPLIT

ThermoFLUX

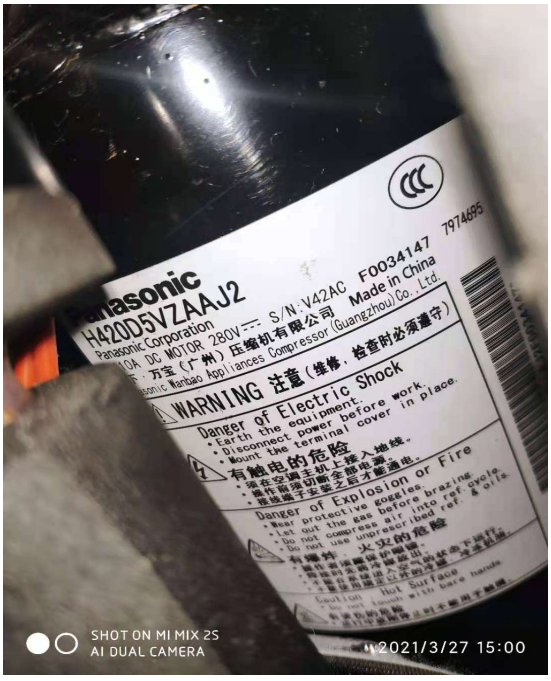
EVI DC Inverter Split Air Source Heat Pumps

	Indoor Unit
Model	TF17DC SPLIT
Power Supply	380 - 415V/3N~, 50Hz
Electric Shock Proof Grade	I
Electric Heater	3kW
Electric Rated Input Power	3kW
Electric Rated Input Current	6.3A
Water Flow	2.9m³/h
Water Pressure Drop	23kPa
Water Pump Head	8.5m
Max. Water Outlet Temperature	55°C
Water Pipe Connection	1 inch
Max Water Pressure	1.0MPa
Net Weight Indoor	42 kg
Date: /NO.	See bar code

ThermoFLUX d.o.o
Bage 3, 70101 Jajce, Bosnia and Herzegovina
www.thermoflux.ba

Appendix III photo documentaiton

Details of:	Overall view of Outdoor unit
View: ☐ General ☐ Front ☐ Rear ☐ Right ☐ Left ☐ Top ☐ Bottom	

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

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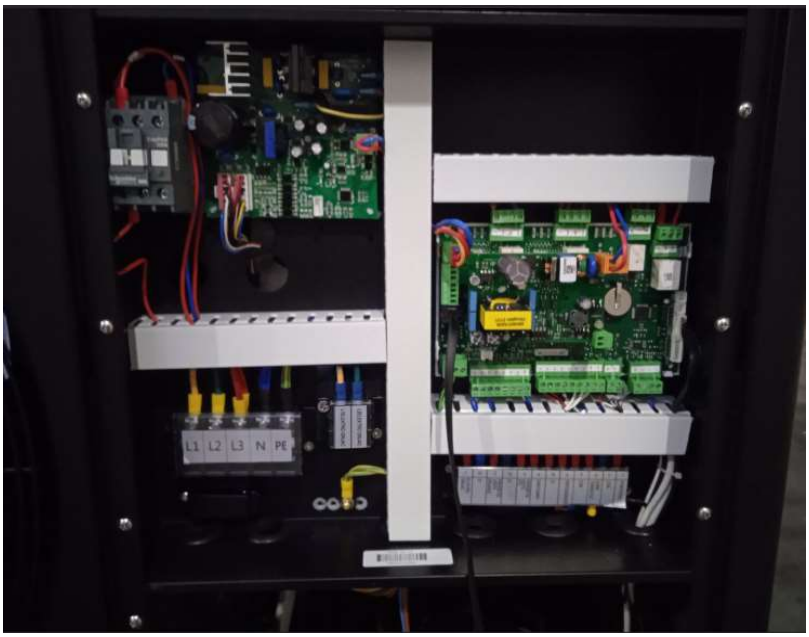
Appendix III photo documentaiton

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

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

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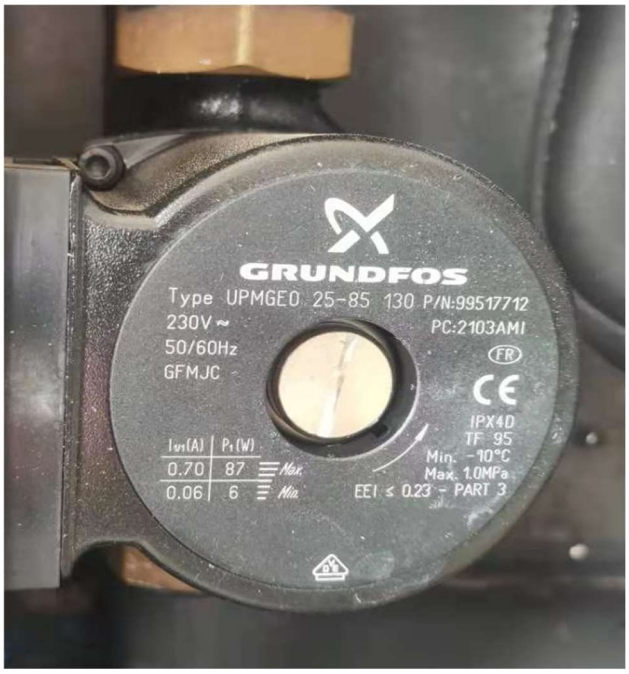
Appendix III photo documentaiton

Details of:	Water Pump of Outdoor unit
View: ☐ General ☐ Front ☐ Rear ☐ Right ☐ Left ☐ Top ☐ Bottom	

Details of:	Overall view of Indoor unit
View: ☐ General ☐ Front ☐ Rear ☐ Right ☐ Left ☐ Top ☐ Bottom	

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Appendix IV Construction data form

Model: Outdoor unit: TF17DC SPLIT; Indoor unit: TF17DC SPLIT		
Part		**Technical data**
1. Compressor		
	Manufacture:	Panasonic Wanbao Appliances Compressor (Guangzhou) Co., Ltd.
	Type:	H420D5VZAAJ2
	Rated capacity:	4490W; R410A
	Serial-number:	N/A
2. Condenser		
	Manufacture:	East -Alliance Thermal Equipment
	Type:	EATB61-D-40-2M-2L
	Heat exchanger:	Plate heat exchanger
	Dimension(mm):	539(L)mmX125(H)mmX103(D)mm
3. Evaporator		
	Manufacture:	Guangzou Aotai Refrigeration Equipment Co., Ltd.
	Type:	05KA-CP-01
	Heat exchanger:	Finned-coil heat exchanger
	Dimension(mm):	660(L)mmX1300(H)mmX345(D)mm
4. Fan motor		
	Manufacture:	Wolong Electric Group Co., Ltd
	Type:	ZWB278D04A
	Fan type:	3 blade
5. Main control board		
	Manufacture:	CAREL
	Type:	UP3CON0S00
	Specification:	380-420V; 50Hz
6. Water pump		
	Manufacture:	GRUNDFOS
	Type:	UPMGE0 25-85 130
	Specification:	230V~; 50/60Hz

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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	-	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 --

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