

TEST REPORT IEC 62109-1 Safety of Power Converter for use in Photovoltaic Power Systems Part 1: General requirements	
Report Number..... :	EFSH24070140-IE-02-L01-A2
Date of issue..... :	2024-07-23; Amendment 2: 2025-01-08
Total number of pages	24 pages
Name of Testing Laboratory preparing the Report	Eurofins Electrical Testing Service (Shanghai) Co., Ltd. Building 18, No. 2168 Chenhang Highway, Minhang District, Shanghai, China
Applicant's name	Envertech (Shanghai) Corporation Ltd.
Address..... :	Room 401, Block 1, No. 138, Xinjunhuan Road, Minhang District, Shanghai, China
Test specification:	
Standard	IEC 62109-1:2010 (First Edition)
Test procedure	Test report
Non-standard test method	N/A
Test Report Form No. :	IEC62109_1B
Test Report Form(s) Originator :	VDE Testing and Certification Institute
Master TRF	Dated 2016-04
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Test item description :	Micro Inverter
Trade Mark :	ENVERTECH
Manufacturer	Envertech (Shanghai) Corporation Ltd. Room 401, Block 1, No. 138, Xinjunhuan Road, Minhang District, Shanghai, China
Model/Type reference	EVT350, EVT400, EVT450, EVT500, EVT600, EVT800, EVT900, EVT1000
Ratings	IP67, Class I;
	Model EVT350: Input: 16~60V DC, MPPT voltage range 22-50V DC, Max. 14A; Output: 220/230V, 50/60Hz, 350W, Max. 1.59A Model EVT400: Input: 16~60V DC, MPPT voltage range 22-50V DC, Max. 14A; Output: 220/230V, 50/60Hz, 400W, Max. 1.81A Model EVT450: Input: 16~60V DC, MPPT voltage range 22-50V DC, Max. 16A; Output: 220/230V, 50/60Hz, 450W, Max. 2.05A Model EVT500: Input: 16~60V DC, MPPT voltage range 22-50V DC, Max. 18A; Output: 220/230V, 50/60Hz, 500W, Max. 2.27A Model EVT600: Input: 16~60V DC, MPPT voltage range 22-50V DC, max. 14A*2; Output: 220/230V, 50/60Hz, 600W, max.2.73A Model EVT800: Input: 16~60V DC, MPPT voltage range 22-50V DC, Max. 14A*2; Output: 220/230V, 50/60Hz, 800W, Max. 3.63A Model EVT900: Input: 16~60V DC, MPPT voltage range 22-50V DC, Max. 16A*2; Output: 220/230V, 50/60Hz, 900W, Max. 4.09A Model EVT1000: Input: 16~60V DC, MPPT voltage range 22-50V DC, Max. 18A*2; Output: 220/230V, 50/60Hz, 1000W, Max. 4.55A
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):	

☒	Testing Laboratory:	Eurofins Electrical Testing Service (Shanghai) Co., Ltd.	
Testing location/ address		Building 18, No. 2168 Chenhang Highway, Minhang District, Shanghai, China	
☐	Associated CB Testing Laboratory:	N/A	
Testing location/ address		N/A	
Tested by (name, function, signature).....:		Jackie Zhao / Project Engineer	
Approved by (name, function, signature)....:		Jack Gan / Manager	
☐	Testing procedure: CTF Stage 1:	N/A	
Testing location/ address			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)....:			
☐	Testing procedure: CTF Stage 2:	N/A	
Testing location/ address			
Tested by (name + signature)			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)....:			
☐	Testing procedure: CTF Stage 3:	N/A	
☐	Testing procedure: CTF Stage 4:	N/A	
Testing location/ address			
Tested by (name, function, signature).....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)....:			
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment): N/A	
Summary of testing: From the result of our inspection and tests on the submitted samples, we conclude they comply with the requirements of the standards.	
Tests performed (name of test and test clause): All applicable tests.	Testing location: Eurofins Electrical Testing Service (Shanghai) Co., Ltd. Building 18, No. 2168 Chenhang Highway, Minhang District, Shanghai, China
Summary of compliance with National Differences (List of countries addressed): EU Group ☒ The product fulfils the requirements of EN 62109-1:2010 Remark: IEC 62109-1: 2010 (EQV)	

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.


ENVERTECH
 PV Microinverter Model: EVT350

Operating Range (Vdc): 16V~60V	Power (Max. Continuous) (W): 350W
MPPT Voltage Range (Vdc): 22V~50V	Normal Voltage (Vac): 220V/230V
Max. DC Input (Vdc): 60V	Current (Max. Continuous) (A): 1.59A
Max. Input Continuous Current (A): 14A	Normal Frequency (Hz): 50Hz/60Hz
Max. Input Short-Circuit Current (A): 25A	Temperature(°C): -40°C to +65°C
Ingress Protection (IP): IP67	Protective Class: Class I
Power Factor Range: +/-0.90	Overvoltage Category: OVC III(AC Main), OVC II(PV)



User Identification Number
 Envertech (Shanghai) Corporation LTD.
www.envertec.com


ENVERTECH
 PV Microinverter Model: EVT400

Operating Range (Vdc): 16V~60V	Power (Max. Continuous) (W): 400W
MPPT Voltage Range (Vdc): 22V~50V	Normal Voltage (Vac): 220V/230V
Max. DC Input (Vdc): 60V	Current (Max. Continuous) (A): 1.81A
Max. Input Continuous Current (A): 14A	Normal Frequency (Hz): 50Hz/60Hz
Max. Input Short-Circuit Current (A): 25A	Temperature(°C): -40°C to +65°C
Ingress Protection (IP): IP67	Protective Class: Class I
Power Factor Range: +/-0.90	Overvoltage Category: OVC III(AC Main), OVC II(PV)



User Identification Number
 Envertech (Shanghai) Corporation LTD.
www.envertec.com


ENVERTECH
 PV Microinverter Model: EVT450

Operating Range (Vdc): 16V~60V	Power (Max. Continuous) (W): 450W
MPPT Voltage Range (Vdc): 22V~50V	Normal Voltage (Vac): 220V/230V
Max. DC Input (Vdc): 60V	Current (Max. Continuous) (A): 2.05A
Max. Input Continuous Current (A): 16A	Normal Frequency (Hz): 50Hz/60Hz
Max. Input Short-Circuit Current (A): 25A	Temperature(°C): -40°C to +65°C
Ingress Protection (IP): IP67	Protective Class: Class I
Power Factor Range: +/-0.90	Overvoltage Category: OVC III(AC Main), OVC II(PV)



User Identification Number
 Envertech (Shanghai) Corporation LTD.
www.envertec.com


ENVERTECH
 PV Microinverter Model: EVT500

Operating Range (Vdc): 16V~60V	Power (Max. Continuous) (W): 500W
MPPT Voltage Range (Vdc): 22V~50V	Normal Voltage (Vac): 220V/230V
Max. DC Input (Vdc): 60V	Current (Max. Continuous) (A): 2.27A
Max. Input Continuous Current (A): 18A	Normal Frequency (Hz): 50Hz/60Hz
Max. Input Short-Circuit Current (A): 25A	Temperature(°C): -40°C to +65°C
Ingress Protection (IP): IP67	Protective Class: Class I
Power Factor Range: +/-0.90	Overvoltage Category: OVC III(AC Main), OVC II(PV)



User Identification Number
 Envertech (Shanghai) Corporation LTD.
www.envertec.com

ENVERTECH

PV Microinverter Model: EVT600

Operating Range (Vdc): 16V~60V
MPPT Voltage Range (Vdc): 22V~50V
Max. DC Input (Vdc): 60V
Max. Input Continuous Current (A): 14Ax2
Max. Input Short-Circuit Current (A): 25Ax2
Ingress Protection (IP): IP67
Power (Max. Continuous) (W): 600W
Temperature (°C): -40°C to +65°C

Normal Voltage (Vac): 220/230V
Current (Max. Continuous) (A): 2.73A
Normal Frequency (Hz): 50Hz/60Hz
Power Factor Range: +/-0.90
Protective Class: Class I
Overvoltage Category: OVC III (AC Main)
OVC II (PV)

User Identification Number

Envertech (Shanghai) Corporation LTD.
www.envertec.com

ENVERTECH

PV Microinverter Model: EVT800

Operating Range (Vdc): 16V~60V
MPPT Voltage Range (Vdc): 22V~50V
Max. DC Input (Vdc): 60V
Max. Input Continuous Current (A): 14Ax2
Max. Input Short-Circuit Current (A): 25Ax2
Ingress Protection (IP): IP67
Power (Max. Continuous) (W): 800W
Temperature (°C): -40°C to +65°C

Normal Voltage (Vac): 220/230V
Current (Max. Continuous) (A): 3.63A
Normal Frequency (Hz): 50Hz/60Hz
Power Factor Range: +/-0.90
Protective Class: Class I
Overvoltage Category: OVC III (AC Main)
OVC II (PV)

User Identification Number

Envertech (Shanghai) Corporation LTD.
www.envertec.com

ENVERTECH

PV Microinverter Model: EVT900

Operating Range (Vdc): 16V~60V
MPPT Voltage Range (Vdc): 22V~50V
Max. DC Input (Vdc): 60V
Max. Input Continuous Current (A): 16Ax2
Max. Input Short-Circuit Current (A): 25Ax2
Ingress Protection (IP): IP67
Power (Max. Continuous) (W): 900W
Temperature (°C): -40°C to +65°C

Normal Voltage (Vac): 220/230V
Current (Max. Continuous) (A): 4.09A
Normal Frequency (Hz): 50Hz/60Hz
Power Factor Range: +/-0.90
Protective Class: Class I
Overvoltage Category: OVC III (AC Main)
OVC II (PV)

User Identification Number

Envertech (Shanghai) Corporation LTD.
www.envertec.com

ENVERTECH

PV Microinverter Model: EVT1000

Operating Range (Vdc): 16V~60V
MPPT Voltage Range (Vdc): 22V~50V
Max. DC Input (Vdc): 60V
Max. Input Continuous Current (A): 18Ax2
Max. Input Short-Circuit Current (A): 25Ax2
Ingress Protection (IP): IP67
Power (Max. Continuous) (W): 1000W
Temperature (°C): -40°C to +65°C

Normal Voltage (Vac): 220/230V
Current (Max. Continuous) (A): 4.55A
Normal Frequency (Hz): 50Hz/60Hz
Power Factor Range: +/-0.90
Protective Class: Class I
Overvoltage Category: OVC III (AC Main)
OVC II (PV)

User Identification Number

Envertech (Shanghai) Corporation LTD.
www.envertec.com

The below information is also marked on the product to distinguish the product with the single grid connector or dual paralleled grid connectors

Model Number	Single grid connector	Dual paralleled grid connectors
EVT350	EVT350-short	EVT350-long
EVT400	EVT400-short	EVT400-long
EVT450	EVT450-short	EVT450-long
EVT500	EVT500-short	EVT500-long
EVT600	EVT600-short	EVT600-long
EVT800	EVT800-short	EVT800-long
EVT900	EVT900-short	EVT900-long
EVT1000	EVT1000-short	EVT1000-long

IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict

Test item particulars.....: Micro Inverter			
Equipment mobility ☐ movable ☐ hand-held ☐ stationary ☒ fixed ☐ transportable ☐ for building-in			
Connection to the mains ☒ pluggable equipment ☐ direct plug-in ☐ permanent connection ☐ for building-in			
Environmental category ☒ outdoor ☒ indoor unconditional ☐ indoor conditional			
Over voltage category Mains ☐ OVC I ☐ OVC II ☒ OVC III ☐ OVC IV			
Over voltage category PV ☐ OVC I ☒ OVC II ☐ OVC III ☐ OVC IV			
Mains supply tolerance (%) -90 / +110 %			
Tested for power systems TN system			
IT testing, phase-phase voltage (V).....: - - -			
Class of equipment.....: ☒ Class I ☐ Class II ☐ Class III ☐ Not classified			
Mass of equipment (kg) 1,8kg for EVT350, EVT400, EVT450 and EVT500 3,7kg for EVT 600, EVT800, EVT900 and EVT1000			
Pollution degree.....: 2			
IP protection class - - -			
.....: IP 67			
Possible test case verdicts:			
- test case does not apply to the test object.....: N/A			
- test object does meet the requirement.....: P (Pass)			
- test object was not evaluated for the requirement: N/E			
- test object does not meet the requirement.....: F (Fail)			
Testing.....:			
Date of receipt of test item 2024-12-12			
Date (s) of performance of tests 2024-12-18 to 2025-01-03			

IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
 "(See appended table)" refers to a table appended to the report.

Test report EFSH23061572-IE-01-L01 with its amendments are cancelled and replaced by this test report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IEC 62109-1:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided

☐ Yes
☒ Not applicable

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) : Shanghai Zhyea Intelligent Technology Co., Ltd
 Building C, No. 8 Shiyuan Road Songjiang District,
 Shanghai, China

General product information:

The grid type inverters type EVT350, EVT400, EVT450, EVT500, EVT600, EVT800 and EVT1000 are single-phase solar-power inverters. They are responsible for converting the direct current generated by photovoltaic panels into single 220/230V, 50/60 Hz alternative current for deliver into the electrical power distribution grid. The inverter only operates when it is connected to the electrical utility grid and cannot operate as a stand-alone unit or in case of AC grid disruption.

The inverter was tested on a 16A branch circuit. The safety of the unit relies on the branch circuit of building installation. If used on a branch circuit greater than this, additional testing may be necessary. The unit is approved for TN mains connections and IEC 60664 overvoltage category III.

The equipment has been evaluated for use in a Pollution Degree III (reduction to pollution degree II because of enclosure IP 67.) and overvoltage category III environment and a maximum altitude of 2000m according to IEC 62109-1. The unit is specified for outdoor and indoor (unconditioned) use.

The input and output are protected by Varistors to Earth. The units are providing EMC filtering at the input and output toward mains. The Micro-inverter does provide galvanic separation from input to output (used transformer to isolate). The output is switched off redundant by the high power switching bridge.

The PV Micro-inverter provides two independent CPUs (Main CPU: CPU A, Slave CPU: CPU B), the main CPU control the fly back circuit, change the DC current to half sine wave and detect the internal temperature. The slave CPU control the H bridge, overturns the half sine wave to 50/60Hz sine wave and monitor the AC current, and AC voltage in parallel with frequency.

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Clause	Requirement + Test	Result - Remark	Verdict

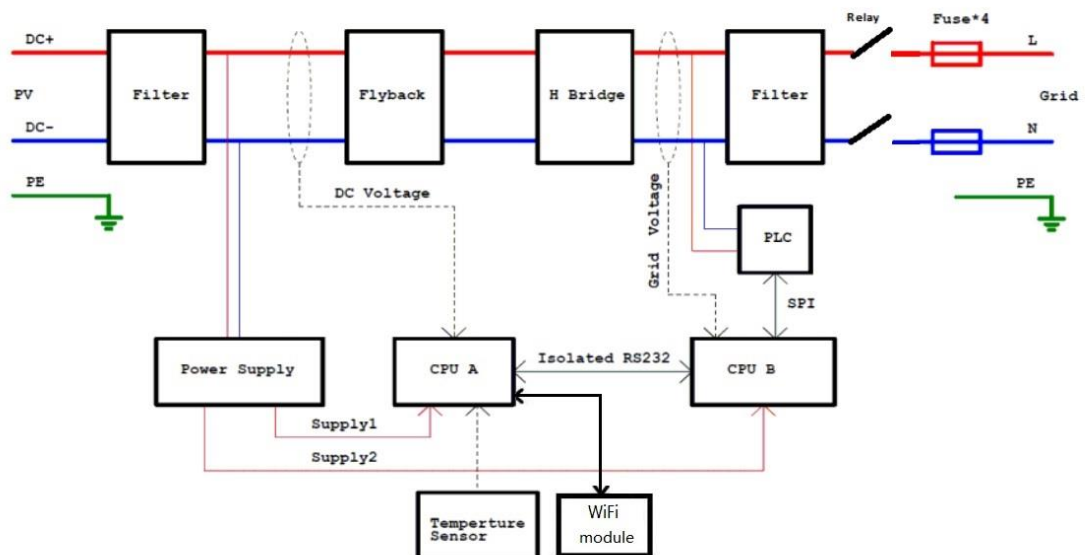
All CPUs monitor signals and analyze the data of the voltage and frequency along with resistors in serial which are connected directly to line/neutral respectively. The inverter provided the LED as the visual interaction to show the inverter 's working condition.

The Wi-Fi module was used for monitoring the micro-inverter operating status and controlling the output of the micro-inverter.

The PV Micro-inverter and systems are restricted for use in closed electrical operating areas.

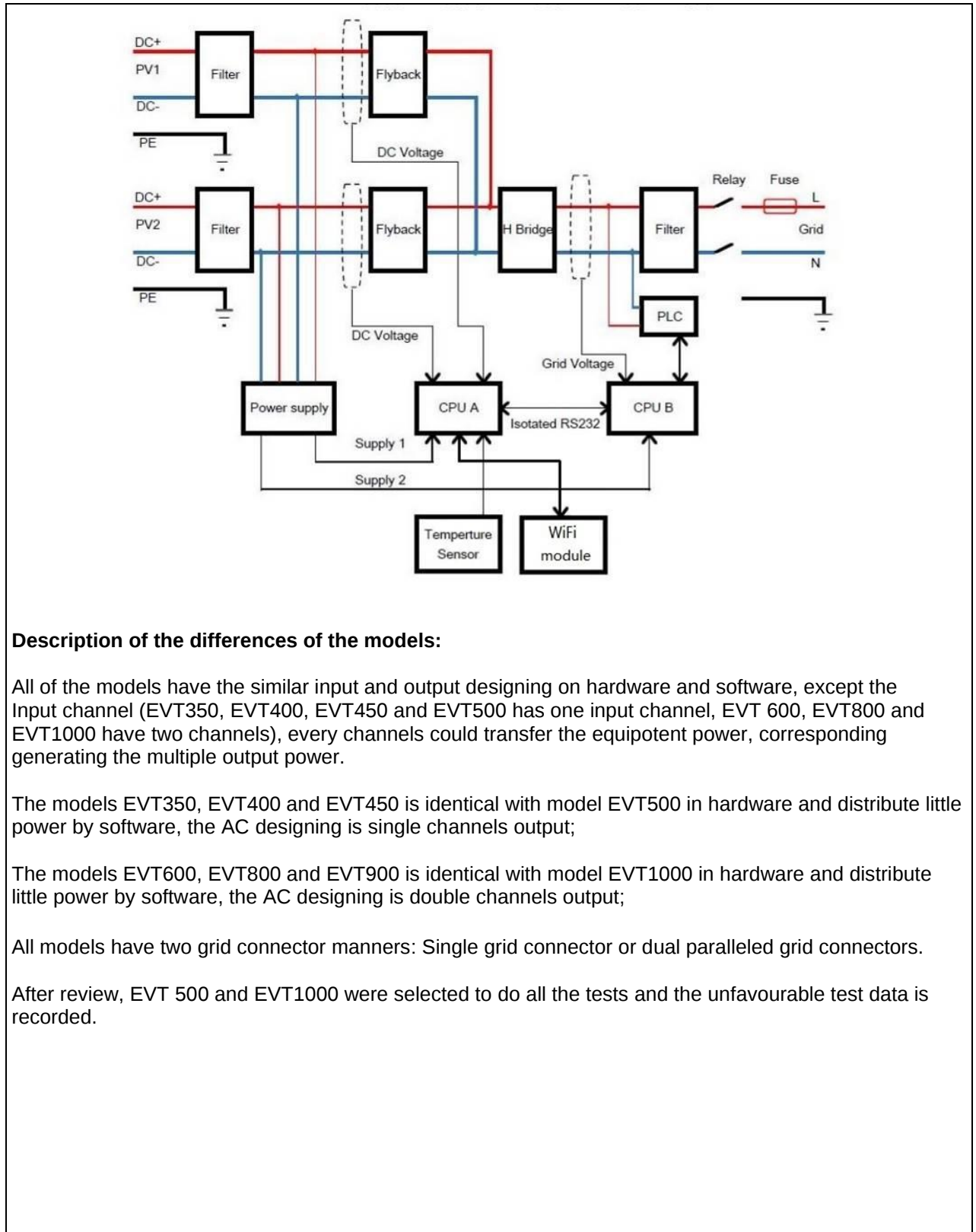
Block diagrams:

Model: EVT350, EVT400, EVT450 and EVT500



Model: EVT600, EVT800, EVT900 and EVT1000

IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict



IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict

The product was tested on:

	EVT600, EVT800, EVT900, EVT1000	EVT350, EVT400, EVT450, EVT500
Hardware version:	EVT720_V6.1	EVT300_V6.11
Software version	V6.16	V6.11

Amendment 1:

The original test report No. EFSH24070140-IE-02-L01, issued on 2024-07-23 was modified on 2024-08-30 with following changes:

1. Correct some components (Relay, transformer, inductor etc.) model number and parameters.
2. Alternative install method for EVT600, EVT800 and EVT1000 added.
3. Some components in EVT 350, EVT400, EVT450, EVT500 revised, after review, it is not influence the test result, only the photos updated.
4. Table 4.2.2.6 of test result for clause 4.7 added.

After review, test of clause 4.7 and 8.5 had been conducted.

This report should be read in conjunction with test report EFSH24070140-IE-02-L01.

Amendment 2:

The original test report No. EFSH24070140-IE-02-L01, issued on 2024-07-23 with its amendments was modified on 2025-01-08 with following changes:

1. Add new models EVT900 which is same with EVT800 and EVT1000 series in hardware and distribute little power by software.
2. WiFi module added to the Table 14 – List of critical components.
3. Correct the rated max. continuous current of EVT450 and EVT1000 as below
 - a. EVT450 from 1.96A to 2.05A
 - b. EVT500 from 2.17A to 2.27A
 - c. EVT1000 from 4.34A to 4.55A
4. Correct model number EVT300 to EVT350 in the photos
5. Correct the appearance photos of EVT600, EVT800, EVT1000

After review, test of clause 4.7 for EVT900 had been conducted.

This report should be read in conjunction with test report EFSH24070140-IE-02-L01 and its amendments.

IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict

IEC 62109-1			
Clause	Requirement – Test	Result – Remark	Verdict
4	GENERAL TESTING REQUIREMENTS		--
4.7	Electrical ratings tests	(see appended table 4.2.2.6)	P
4.7.1	Input ratings		P
4.7.1.1	Measurement requirements for DC input ports		P
4.7.2	Output ratings		P

IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.2.2.6	TABLE: mains supply electrical data in normal condition					P
Type	U (V) DC	I (A) DC	P (W) DC	U (V) grid	I (A) AC	P (W) AC
EVT900	31.52	15.79	498	220.29	4.108	901
	31.46	15.75	496			
	47.95	10.20	489	220.37	4.124	906
	47.89	10.35	495			
	50.12	9.81	492	220.07	4.141	909
	50.08	9.94	498			

IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict

14	TABLE: list of critical components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾	
DC connector	Zhang jiagang Talen Technology Co.,Ltd	TN-P(R)02	1000V DC 30A IP68	IEC 62852:2014	TUV SUD 4478019406 749-065	
Alternative	Ningbo Lihui Photovoltaic Technology Co., Ltd.	PV-CXLH0601- 1	1500VDC 30A IP68	IEC 62852:2014	TUV SUD NO. B 002459 0002	
AC connector	Wuxi Betteri Electronic Technology Co.,LTD.	BC01-3F22-15 BC01-3M22-15	25A(4mm ²), 250V, 4kV	TUV PPP 59015A:2013	TUV SUD B 085127 0011	
Alternative	Shanghai Yuzhi Electronic Technology Co.,Ltd.	YZ-002 / YZL- 002	25A(4mm ²), 250V, 4kV	2 PFG 1915/03.15	TUV Rh J50504611 0003	
DC cable	NINGBO ZHIHENG CABLE CO.,LTD	H1Z2Z2-K 1*4mm ²	1500V XLPE 6.1±0.10 -40℃~+90℃	EN 50618 IEC/EN62109-1/2	Test with appliance + TUV B107732000 1	
AC cable	Suzhou Baohing Electric Wire & Cable CO., LTD.	3C/12AWG- BRG/Y	XLPE 11.1±0.30 -40℃ to +90℃, 600Vac,	IEC/EN62109-1/2	Test with appliance	
Insulating Bushing	KINGFA SCI & TECH CO LTD	VSLOY-PM BK001	UL 94 V-0@1.5mm- 3.0mm 5VA@2.0mm	IEC/EN62109-1/2	Test with appliance	
Epoxy resin	Shanghai Beginor polymer materials Co., Ltd	Besil 8230 A/B	V-0, 105℃, A:B=100:100 UL E340199	IEC/EN62109-1/2	Test with appliance	
PCB (for EVT350, EVT400, EVT 450, EVT500)	KUNSHAN CITY SUYUAN ELECTRONICS GROUP CO., LTD.	EVT300	130 °C, 1.6mm, UL94 V-0 UL E233870	IEC/EN62109-1/2	Test with appliance	
PCB (for	KUNSHAN	EVT720	130 °C, 1.6mm,	IEC/EN62109-1/2	Test with	

IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict

14	TABLE: list of critical components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾	
EVT600, EVT800, EVT1000)	CITY SUYUAN ELECTRONICS GROUP CO., LTD.		UL94 V-0 UL E233870		appliance	
Relay (K1 for EVT600, EVT800, EVT1000; K2 for other models)	Xiamen Hongfa Electroacoustic Co., Ltd.	HF115F-012- 2HS4AF	250Vac 8A 12Vdc 85°C	DIN EN 61810-1	VDE 116934	
Fuse (F2)	Littelfuse	39216300000	250Vac, 6.3A; -40°C to +125°C	DIN EN 60127-1 DIN EN 60127-3 IEC 60127-1 IEC 60127-3	VDE 126983	
Optocoupler (ISO1,ISO4, ISO5, ISO6,ISO8, ISO9)	Xiamen Hualian Electronics Corp., Ltd	HPC817D-2	-55~110°C, 5000Vrms CI Cr ≥7mm	DIN EN/IEC 60747-5-5	VDE 40004708	
Alternative	Fairchild Semiconductor Corp	FOD817DSD	-55~110°C, 5000Vrms	DIN EN/IEC 60747-5-5	VDE 40026857	
Optocoupler (ISO2, ISO3)	LITE-ON Technology Corp	LTV-3053	1A 600V -55°C~115°C	DIN EN/IEC 60747-5-5	VDE 138213	
X-Cap. (C207,C209) (for EVT600, EVT800, EVT1000)	Xiamen Faratronic Co. Ltd.	MKP62 C42Q2684K9S C400	X2,305VAC,0.68u F, -40~110°C	DIN EN 60384-14	VDE 40000358	
X-Cap. (C205) (for EVT600, EVT800, EVT1000)	Xiamen Faratronic Co. Ltd.	MKP62 C42Q2684K9S C800	X2,305VAC,0.68u F, -40~110°C	DIN EN 60384-14	VDE 40000358	
X-Cap.	Xiamen	MKP62	X2,305VAC,1.5uF,	DIN EN 60384-14	VDE	

IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict

14	TABLE: list of critical components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾	
(C214 for EVT600, EVT800, EVT1000; C150 for other models)	Faratronic Co. Ltd.	C42Q2155M9S C350	-40~110°C		40000358	
X2 capacitor (C131,C149,C3 2) (for EVT350,EVT40 0EVT450,EVT5 00)	Xiamen Faratronic Co. Ltd.	MKP62 C42Q2684M6S C350	305V 0.68uF X2 -40 °C~+110°C	DIN EN 60384-14	VDE 40000358	
Alternative	Xiamen Faratronic Co. Ltd.	C42Q2684K6 SC350	305V 0.68uF X2 -40 °C~+110°C	DIN EN 60384-14	VDE 40000358	
X2 capacitor (C47) (for EVT350,EVT40 0EVT450,EVT5 00)	Xiamen Faratronic Co. Ltd.	MKP62 C42P2473K4TC 352	275V 47nF X2 -40 °C~+125°C	DIN EN 60384-14	VDE 40000358	
Y-Cap. (C157,C131) (for EVT600, EVT800, EVT1000)	TDK (Zhuhai FTZ) Co., Ltd.	CS45- E2GA472M- NKA	Y2,300VAC 4.7nF, -25~125°C	DIN EN 60384-14	ENEC- 01049	
Alternative	TDK (Zhuhai FTZ) Co., Ltd.	CS45- E2GA472M- GKA	Y2,300VAC 4.7nF, -25~125°C	DIN EN 60384-14	ENEC- 01049	
Alternative	TDK (Zhuhai FTZ) Co., Ltd.	CS45- E2GA472M- VKA	Y2,300VAC 4.7nF, -25~125°C	DIN EN 60384-14	ENEC- 01049	
Y2 capacitor (C128,C133) (for EVT600,EVT80 0,EVT1000; C148,C151 for other models)	Xiamen Faratronic Co. Ltd.	C43Q1103M40 C350	300Vac 10nF Y2 - 40 °C~+110°C	IEC 60384-14 EN 60384-14	SE/0366-2D	

IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict

14	TABLE: list of critical components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾	
Y2 capacitor (C177,C178,C183,C193for EVT600,EVT800,EVT1000; C100,C102.C138,C147 for other models)	Xiamen Faratronic Co. Ltd.	C43Q1472M40 C350	300V 4.7nF Y2 -40 °C~+110°C	IEC 60384-14 EN 60384-14	SE/0366-2D	
Alternative	TDK (Zhuhai FTZ) Co., Ltd.	B32021A3472M 000	300VAC Y2 4.7nF -40~110°C	IEC 60384-14 EN 60384-14	VDE 40018909	
Y2 capacitor (C184,C185)	TDK (Zhuhai FTZ) Co., Ltd.	CS45- B2GA471K- NKA	300V 470pF Y2 -25 ~ +125°C	EN 60384-14 IEC 60384-14	ENEC- 01049	
Alternative	TDK (Zhuhai FTZ) Co., Ltd.	CS45- B2GA471K-VKA	300V 470pF Y2 -25 ~+125°C	EN 60384-14 IEC 60384-14	ENEC- 01049	
Y2 capacitor (C14,C15,C215 for EVT600,EVT800,EVT1000;C128,C133 for other models)	Xiamen Faratronic Co. Ltd.	C43Q1332M40 C350	300Vac 3.3nF Y2 -40 °C~+110°C	IEC 60384-14 EN 60384-14	SE/0366-2D	
Varistor (RV1,RV2,RV4, RV5,RV7, RV8)	BESTBRIGHT ELECTRONICS CO LTD	471KH14J	300VAC 175J 6KA P7.5mm -40~125°C	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	TUV NO. B 096048 0010 Rev.01	
Varistor (RV3)	Bestbright Electronics Co., Ltd.	271KH14J	175VAC 99J 6KA P7.5mm -40~125°C	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	TUV B096048 0010 Rev.01	
Gas discharge tube (GAP1, GAP2)	Bestbright Electronics Co., Ltd.	2RP600L-8	20KA/600V -40~85°C	DIN 61643-311	VDE 40043014	
AC Thyristor (QS2.QS1)	ORIENTAL SEMICONDUCT	OSG80R250KF	N-Channel 800V 17A TO-263	IEC/EN 62109- 1/2	Test with appliance	

IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict

14	TABLE: list of critical components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾	
	TOR					
Alternative	Wuxi Unigroup Microelectronics Co.,Ltd	TPB80R180M	N-Channel 800V 23A TO-263	IEC/EN62109-1/2	Test with appliance	
Inductors (L3 for EVT600, EVT800, EVT1000; L1 for for other models)	SHANGHAI SANGDAI ELECTRONICS CO. , LTD.	SD221413- 10mH	Lcm 10mH min. DCR 60mΩ max. 125°C	IEC/EN62109-1/2	Test with appliance	
Inductors (L1 for EVT600, EVT800, EVT1000;L23 for for other models)	SHANGHAI SANGDAI ELECTRONICS CO. , LTD.	SD18107-4mH	Lcm 4mH min. DCR 35mΩ max. 125°C	IEC/EN62109-1/2	Test with appliance	
Inductors (L2 for EVT600, EVT800, EVT1000;L3 for for other models))	SHANGHAI SANGDAI ELECTRONICS CO. , LTD.	SD211510-5mH	Lcm 5mH min. DCR 50mΩ max. 125°C	IEC/EN62109-1/2	Test with appliance	
Inductors (T6,T7for EVT600, EVT800, EVT1000; T2 for for other models))	SHANGHAI SANGDAI ELECTRONICS CO. , LTD.	SD18107- 470uH	Lcm 470uH min. DCR 7mΩ max. 125°C	IEC/EN62109-1/2	Test with appliance	
Main Transformer (T0, T1, T2, T3 for EVT600, EVT800, EVT1000; T0, T1 for other models)	SHANGHAI SANGDAI ELECTRONICS CO., LTD.	BIHE-PQ3418- 3.5uH	BHPQ3418 3.5uH±10% 130°C	IEC/EN62109-1/2	Test with appliance	
- Bobbin	SUMITOMO	PM9630	PQ34,150°C E41429	IEC/EN62109-1/2	Test with appliance	
- Triple	HUIZHOU	TIW-B	0.14mm*7,130°C	IEC/EN62109-1/2	Test with	

IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict

14	TABLE: list of critical components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾	
insulated wire	DONGJU FLUO TECH		E488352		appliance	
- Insulation tape	SHEN ZHEN XINHUAHUI ELECTRONIC MATERIALS	HMT	0.025mm,130°C E328315	IEC/EN62109-1/2	Test with appliance	
Alt. transformer	JiangSu FuJun Electronic Technology Co.,Ltd.	FJ-PQ3418- 3.5uH	PQ3418 3.5uH±10%@100 KHz,0.1 V, 130°C	IEC/EN62109-1/2	Test with appliance	
- Bobbin	SUMITOMO	PM9630	UL94V-0, 150°C E41429	IEC/EN62109-1/2	Test with appliance	
- Triple insulated wire	Shenzhen KaizhongHedon g New Material Co., Ltd.	TIW-B-LITZ*	130°C E357240	IEC/EN62109-1/2	Test with appliance	
- Insulation tape	YaHua	CT-280/PF-301	130°C E165111	IEC/EN62109-1/2	Test with appliance	
Alt. transformer	Luijiang Herun Technology Co.,Ltd	HR-PQ3418- 3.5uH	3.5uH±10% Class B,130°C	IEC/EN62109-1/2	Test with appliance	
- Bobbin	SUMITOMO	PM9630	UL94V-0, 150°C E41429	IEC/EN62109-1/2	Test with appliance	
- Triple insulated wire	SUZHOU YUSHENG ELECTRONIC CO LTD	TIW-B	130°C E332529	IEC/EN62109-1/2	Test with appliance	
- Insulation tape	JINGJIANG JINGYANG INSULATING PRODUCT CO LTD	JY-201	130°C E309872	IEC/EN62109-1/2	Test with appliance	
Transformer (T4)	SHANGHAI SANGDAI	BIHE-EF17- 50uH	50uH±10%(12- 13)@200KHz, 1V	IEC/EN62109-1/2	Test with appliance	

IEC 62109-1			
Clause	Requirement + Test	Result - Remark	Verdict

14	TABLE: list of critical components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾	
	ELECTRONICS CO., LTD.					
-Tripple insulation winding	HUIZHOU DONGJU FLUO TECH PLASTIC CO.,LTD.OR EQUIVALENT	TIW-B	0.2mm*7 130℃ E488352	IEC/EN62109-1/2	Test with appliance	
- Winding	DONG GUAN YIDA INDUSTRIAL CO.,LTD.OR EQUIVALENT	2UEW	0.1mm E344055	IEC/EN62109-1/2	Test with appliance	
-Bobbin	SUMITOMO CHEMICAL CO.,LTD.OR EQUIVALENT	PM9630	EF17 E41429	IEC/EN62109-1/2	Test with appliance	
-Tape	SHEN ZHEN XINHUAHUI ELECTRONIC MATERIALS CO.,LTD.OR EQUIVALENT	HMT	0.025mm E328315	IEC/EN62109-1/2	Test with appliance	
Wi-Fi Module	High-Flying Electronics Technology Co., Ltd.	HF-LPT170	3.3V DC	IEC/EN62109-1/2	Test with appliance	
Alternative	Hangzhou Tuya Information Technology Co., Ltd.	CBU-IPEX	3.3V DC	IEC/EN62109-1/2	Test with appliance	
¹⁾ an asterisk indicates a mark which assures the agreed level of surveillance						

Photo 1

Description: EVT350, EVT400, EVT450, EVT500 (EVT**-long (**=300, 400, 450, 500)) internal view

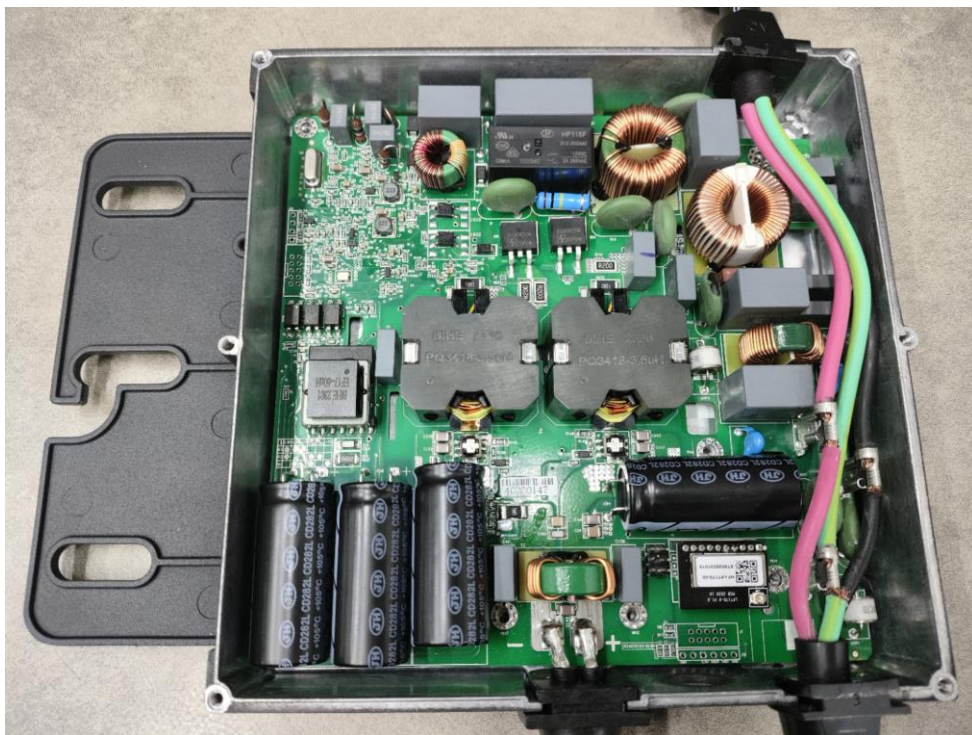


Photo 2

Description: EVT350, EVT400, EVT450, EVT500 (EVT**-short (**=300, 400, 450, 500)) internal view

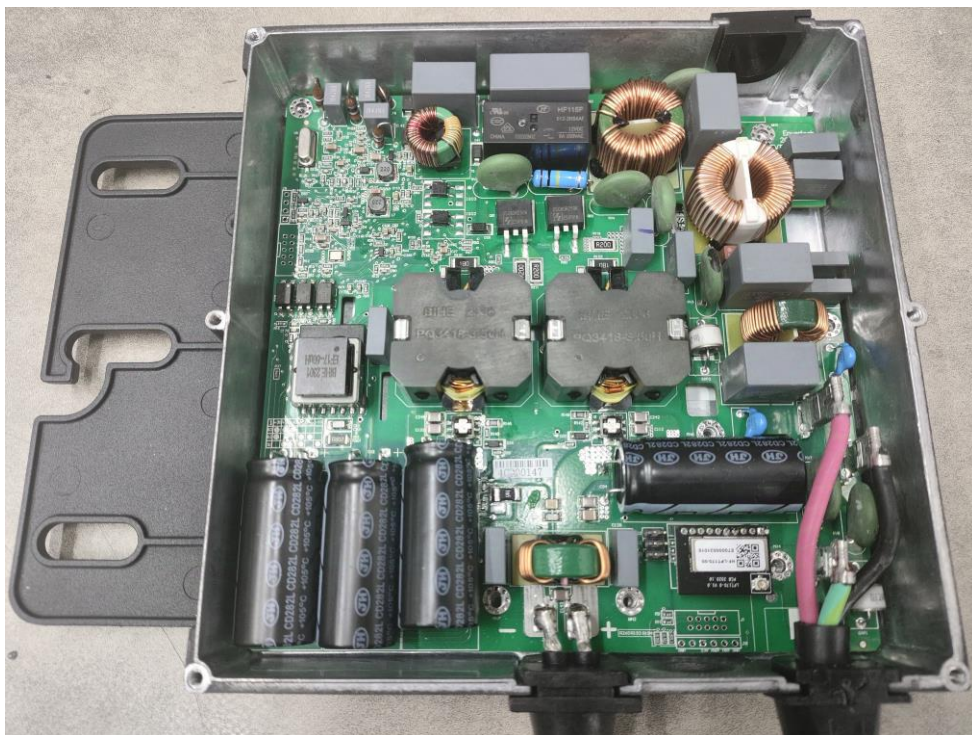


Photo 3

Description: EVT350, EVT400, EVT450, EVT500 PCB top view



Photo 4

Description: EVT350, EVT400, EVT450, EVT500 PCB bottom view

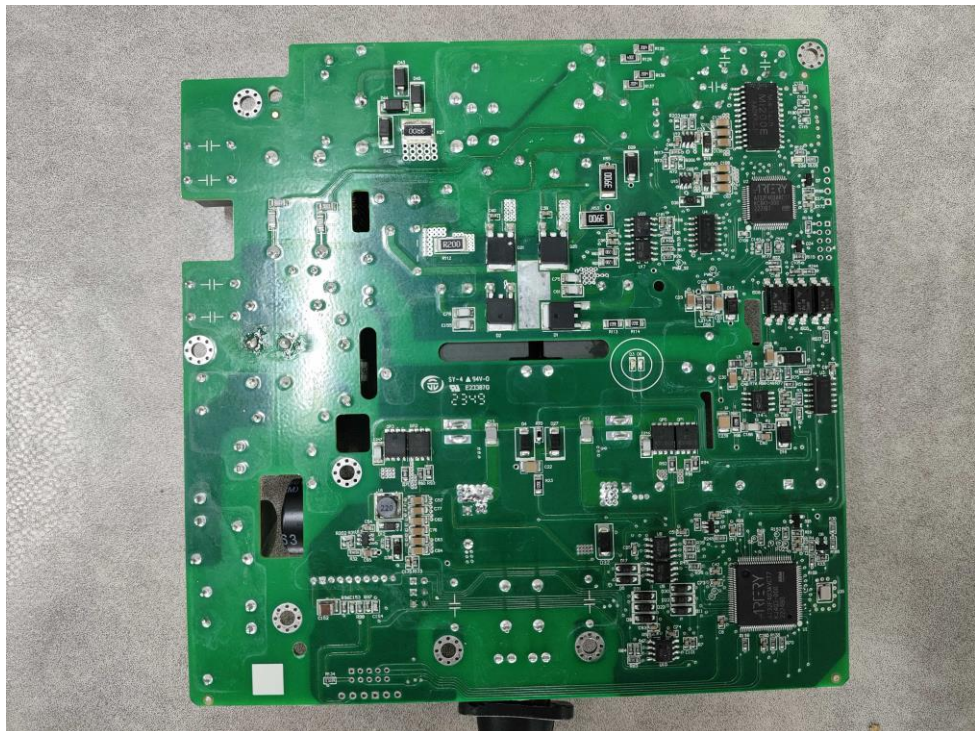


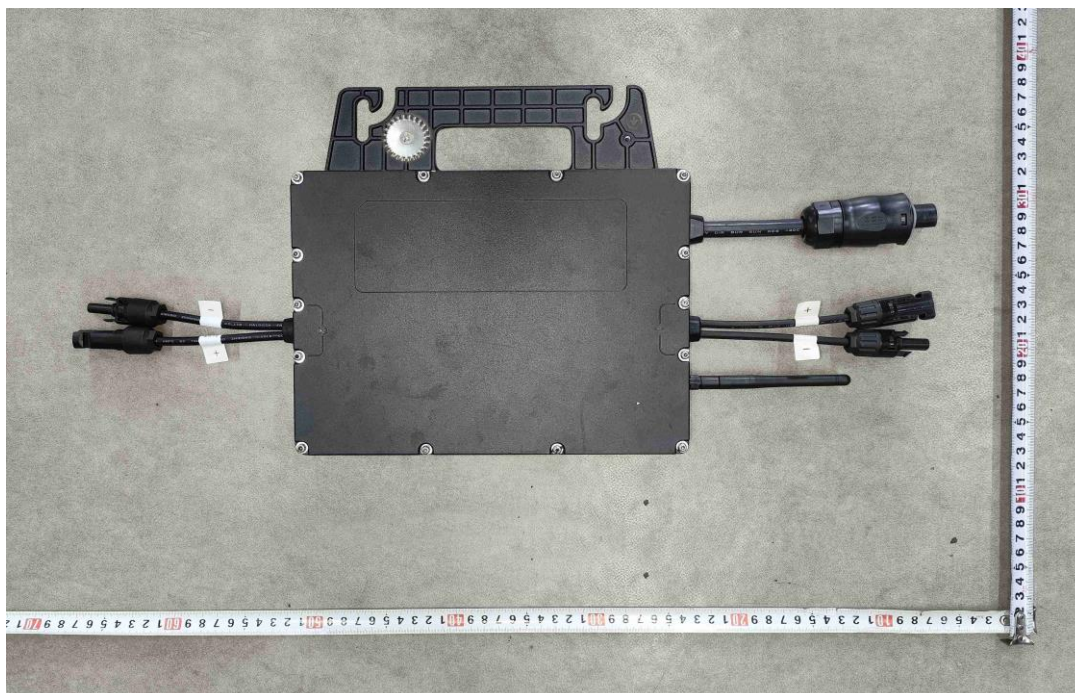
Photo 5

Description: EVT600, EVT800, EVT900, EVT1000 (EVT**-short (**=600, 800, 1000)) top view (alternative install method)



Photo 6

Description: EVT600, EVT800, EVT900, EVT1000 (EVT**-short (**=600, 800, 1000)) bottom view (alternative install method)



----- End of test report -----