Test Report

Date Issued：2022-07-05
Report No .：11055C01031-2-12-02
Version：A

Service Item： 日照計累積照度比對英文測試報告

　　Brand Name：-----
　　Model(Item No./Style)：-----
　　Serial No.：-----

Client

　　Company Name： 日灝能源科技股份有限公司

　　Address： 新北市板橋區溪福里金門街 369 巷 11 號 7 樓

Result of Service Item, performed by ITRI Laboratory, is specified on the next/ following page(s).

This report, including a signature page and content, is a total of 11 pages. The validity of this report no longer exists if signature page and content are separated.

James Way	*Chao Yang Huang*
General Director	Department Manager
Green Energy & Environment Lab	

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Commission Information:

Sample name：Pyranometer
Brand name、Model no.、Serial no.：Refer to table 1
Duration of test：June 01 to June 30, 2022

Laboratory Information:

Lab. name: Photovoltaics System Testing Laboratory
Address of Lab.: Rm. 415, BF., No. 360, Gaofa 2nd Rd., Guiren Dist., Tainan City 711,
Taiwan (R.O.C.)
Tel: +886-6-3636861
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Approval Signatory

Testing Lab. Head

I. Test Results and Descriptions:

1. Information of pyranometer

Table 1				
Item	Brand name	Model no.	Serial no.	Provider
Table A	Hukseflux	SR30-D1	6586	ITRI-GEL-R300-Photovoltaics System Testing Laboratory
Table B	Deltaohm	PYRA03AC	21013200	日灝能源
Table C	Hukseflux	SR05-D2A2	9379	日灝能源

2. Documentation:

Table 2	
Customer information	日灝能源科技股份有限公司
Test site address	Roof of Building C, No. 360, Gaofa 2nd Rd., Guiren Dist., Tainan City 郵遞區號 , Taiwan (R.O.C.) 台南市歸仁區高發二路 360 號 C 棟屋頂
Site information	
Latitude，Longitude	A(22°55'15.4"N 120°17'29.6"E) B(22°55'13.0"N 120°17'30.6"E) C(22°55'13.8"N 120°17'32.8"E) D(22°55'16.1"N 120°17'31.8"E)

Data acquisition timing and reporting	Sampling	3 seconds
	Recording	1 minute
	Reporting	30days (2022/06/01~2022/06/30)

Angle of pyranometer	Global horizontal irradiance

3. Measured parameters:

Table A	
Measured parameters	Global horizontal irradiance
Number of sensor	1 pcs
Manufacturer	Hukseflux
Mode/Serial No.	SR30-D1/6586
Sensor locations	 Pyranometer at the red circle
Sensor maintenance	Recalibration	(1) Once per year (2) Report No.: 11107C00444-1-1-03
Sensor type	Classified

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■ Thermopile pyranometers	■ Class A	■ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals)
	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)
	☐ Class C	Any:_____
☐ PV reference cell ☐ PV reference module	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) $W \cdot m^2$
	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) $W \cdot m^2$
	☐ Class C	Any:_____
☐ Photodiode sensors	☐ Class A	Not applicable:_____
	☐ Class B	Not applicable:_____
	☐ Class C	Any:_____

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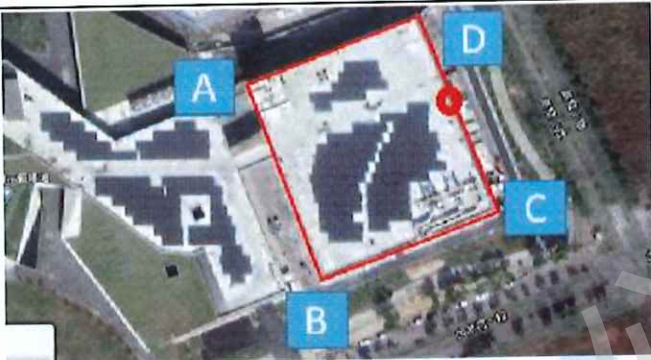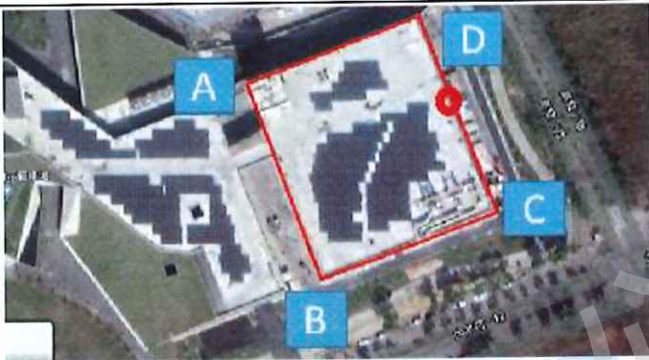| Table B	
Measured parameters	Global horizontal irradiance
Number of sensor	1 pcs
Manufacturer	Deltaohm
Mode/Serial No.	PYRA03AC/21013200
Sensor locations	

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Pyranometer at the red circle

Sensor maintenance	Recalibration	N/A
Sensor type		**Classified**
■ Thermopile pyranometers	☐ Class A	☐ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals)
	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)
	■ Class C	Any: <u>Second class pyranometer according to ISO 9060.</u>
☐ PV reference cell ☐ PV reference module	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m²
	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m²
	☐ Class C	Any:_____
☐ Photodiode sensors	☐ Class A	Not applicable:_____
	☐ Class B	Not applicable:_____
	☐ Class C	Any:_____

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Table C	
Measured parameters	Global horizontal irradiance
Number of sensor	1 pcs
Manufacturer	Hukseflux
Mode/Serial No.	SR05-D2A2/9379
Sensor locations	

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Pyranometer at the red circle

Sensor maintenance	Recalibration	N/A
Sensor type	**Classified**	
■ Thermopile pyranometers	☐ Class A	☐ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals)
	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)
	■ Class C	Any: <u>Second class pyranometer according to ISO 9060.</u>
☐ PV reference cell ☐ PV reference module	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) $W \cdot m^2$
	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) $W \cdot m^2$
	☐ Class C	Any:_____
☐ Photodiode sensors	☐ Class A	Not applicable:_____
	☐ Class B	Not applicable:_____
	☐ Class C	Any:_____

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4. Test result:

Date	Duration[Note 1]	Module no./SN		
		SR30-D1	LPPYRA03AC	SR05-D2A2
		6586	21013200	9379
2022/06/01[Note 2]	05:28:51~18:24:33	7.83	7.45	7.81
2022/06/02	05:31:06~18:24:36	7.42	7.11	7.42
2022/06/03	05:31:27~18:19:24	7.88	7.55	7.89
2022/06/04	05:31:51~17:06:24	5.03	4.81	5.02
2022/06/05	05:31:45~18:18:15	6.42	6.15	6.43
2022/06/06	05:38:18~18:19:39	5.29	4.99	5.25
2022/06/07	06:22:27~17:54:42	2.29	2.17	2.28
2022/06/08	05:44:09~17:39:21	2.90	2.75	2.87
2022/06/09	06:07:39~17:57:54	3.74	3.57	3.70
2022/06/10	05:31:45~18:29:30	3.52	3.35	3.50
2022/06/11	05:31:27~17:42:42	3.63	3.44	3.59
2022/06/12	05:50:12~18:24:03	6.90	6.54	6.87
2022/06/13	05:26:12~18:28:57	6.92	6.49	6.85
2022/06/14	05:31:57~18:29:54	5.62	5.30	5.58
2022/06/15	05:29:03~18:32:06	6.47	6.12	6.45
2022/06/16	05:27:51~18:25:54	6.91	6.52	6.88
2022/06/17	05:31:12~18:51:51	7.13	6.71	7.07
2022/06/18	05:31:27~18:19:24	7.78	7.45	7.83
2022/06/19	05:32:45~18:26:06	7.75	7.34	7.75
2022/06/20	05:31:15~18:27:57	7.80	7.38	7.80
2022/06/21	05:34:09~18:32:24	7.58	7.16	7.58
2022/06/22	05:32:57~18:32:03	7.27	6.85	7.24
2022/06/23	05:28:12~18:29:27	8.02	7.58	8.02
2022/06/24	05:29:33~17:14:21	6.38	6.00	6.36
2022/06/25	05:41:48~18:05:36	5.58	5.28	5.56
2022/06/26	05:30:33~18:50:06	7.15	6.74	7.11
2022/06/27	05:30:18~18:03:03	5.47	5.08	5.40
2022/06/28	05:31:48~17:24:39	5.32	4.99	5.29
2022/06/29	05:46:39~17:36:18	2.81	2.61	2.76
2022/06/30	05:28:15~18:34:33	6.43	6.13	6.42
2022/06/01~2022/06/30 Summing the irradiance		181.24 kWh/m²	171.62 kWh/m²	180.58 kWh/m²
Deviation(Benchmark:SR30-D1)		N/A	5.31 %	0.36 %

Note 1:According to process data for irradiance and PV-generated power should be restricted to the daylight hours of each day (sunrise to sunset, irradiance ≥ 20 W/m²) to avoid extraneous night-time data values that introduce errors in analyses, unless such errors have been demonstrated to be negligible.

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Note 2:Start to tset.

II. Descriptions:

    1. Date and Location of Test

       The test was performed at the site address in table2, ITRI during the period from June 01, 2022 to June 30, 2022.

    2. Test Methods : According to the IEC 61724-1:2017.

III. References:

    1. IEC 61724-1：2017, first edition, Photovoltaic system performance –Part 1: Monitoring.

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