

Test Report

Date Issued: 2022-02-11

Report No .: 11055C01031-2-5-02

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: 日顯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).

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Periou of

Chao Yang Huang

Vice President and General Director Green Energy and Environment Research Laboratories

Department Manager

2022/02/14 08:28:34 637804241146245777



Commission Information:

Sample name: Pyranometer

Brand name • Model no. • Serial no. • Refer to table 1 Duration of test : August 10 to December 31, 2021

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 Fax: +886-6-3032029

杂汰義

Approval Signatory

杂洪義

Testing Lab. Head





Test Results and Descriptions:

1. Information of pyranometer

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

2. Documentation:

Tol.1- 2				
Table 2				
Customer information	日瀕能源科技股份有	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	A			
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	7'31.8"E)		
	Sampling	3 seconds		
Data acquisition timing and	Recording	1 minute		
reporting	Reporting	2021/08/10~2021/12/31		
Angle of pyranometer Global horizontal irradiance		ance		

Measured parameters:

Measured parameters Number of sensor I pcs Manufacturer Hukseflux Mode/Serial No. SR30-D1/6586 January Arctions Pyranometer at the red circle Pyranometer at the red circle Recalibration Recalibration (1) Once per year (2) Report No.: N/A	3. Measured parameter			
Number of sensor Manufacturer Hukseflux SR30-D1/6586 Pyranometer at the red circle Recalibration Record to sensor 1 pcs Hukseflux A D C D D D D D D D D D D D		Table A		
Manufacturer Hukseflux SR30-D1/6586 Fundamental Policy of the property of t				
Pyranometer at the red circle Recalibration Resort No. SR30-D1/6586 Pyranometer at the red circle Recalibration (1) Once per year (2) Report No.: N/A				
Pyranometer at the red circle Recalibration (1) Once per year (2) Report No.: N/A	Manufacturer	Hukseflux		
Pyranometer at the red circle ensor maintenance Recalibration (1) Once per year (2) Report No.: N/A	Mode/Serial No.	SR30-D1/6586		
Pyranometer at the red circle ensor maintenance Recalibration (1) Once per year (2) Report No.: N/A				
Pyranometer at the red circle ensor maintenance Recalibration (1) Once per year (2) Report No.: N/A	Sensor locations			
ensor maintenance Recalibration (1) Once per year (2) Report No.: N/A		C B		
(2) Report No.: N/A				
	ensor maintenance	1 Recamplation 1		
	Sensor type	Classified		

Report No.: 11055C01031-2-5-02

	Class A	 Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals)
Thermopile pyranometers	☐ Class B	 ☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)
	☐ Class C	Any:
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m²
	☐ Class C	Any:
	☐ Class A	Not applicable:
☐ Photodiode sensors	☐ Class B	Not applicable:
	☐ Class C	Any:



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Report No.: 11055C01031-2-5-02

	Table B			
Measured parameters	Global horizontal irradiance			
Number of sensor	1 pcs			
Manufacturer	Deltaohm			
Mode/Serial No.	PYRA03AC/21013200			
Sensor locations	LP PYRA D3 AC S/IV 21013200 4mA → 0.0Wm/s 2000Wm/s			



12 14	Pyranometer at the red circle		
Sensor maintenance	Recalibration	N/A	
Sensor type		Classified	
	☐ Class A	 ☐ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals) 	
Thermopile pyranometers	☐ Class B	 ☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals) 	
	Class C	Any: Second class pyranometer according to ISO 9060.	
	☐ Class A	Uncertainty $\leq 3 \%$ from (100 ~1500) W·m ²	
☐ PV reference cell ☐ PV reference module	Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m ²	
	☐ Class C	Any:	
	☐ Class A	Not applicable:	
☐ Photodiode sensors	☐ Class B	Not applicable:	
	☐ Class C	Any:	



Sensor locations

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Report No.: 11055C01031-2-5-02

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





Report No.: 11055C01031-2-5-02

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	Pyranometer at the	e red circle
Sensor maintenance	Recalibration	N/A
Sensor type	Total Man	Classified
	☐ Class A	 ☐ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals)
Thermopile pyranometers	☐ Class B	☐ First class per ISO 9060☐ Good quality per WMO Guide No. 8(Uncertainty ≤ 8 % for hourly totals)
	Class C	Any: Second class pyranometer according to ISO 9060.
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²
☐ PV reference cell☐ PV reference module	☐ Class B	Uncertainty $\leq 8 \%$ from (100 ~1500) W·m ²
	☐ Class C	Any:
	☐ Class A	Not applicable:
☐ Photodiode sensors	☐ Class B	Not applicable:
	☐ Class C	Any:

4. Test result:

Date(summation the	Summing the irradiance (kWh/m²)			
irradiance in the reporting	Model:SR30-D1	Model:LPPYRA03AC	Model:SR05-D2A2	
period)	SN:6586	SN:21013200	SN:9379	
2021/08/10~2021/08/28	70.19	66.85	70.13	
2021/09/03~2021/09/30	145.22	138.58	145.12	
2021/11/04~2021/11/30	103.73	100.46	103.68	
2021/12/01~2021/12/31	113.36	108.57	111.10	
2021/08/10~2021/12/31	432.50	414.46	430.03	
Deviation Benchmark:SR30-D1)	N/A	3.1%	1.6%	

Note:

- (1) The power system of the test site will be repaired during the period from October 01, 2021 to October 31, 2021.
- (2) 2021/08/10~2021/08/28 Testing report NO.: 11055C01031-2-1-02-RPT-1
- (3) 2021/09/03~2021/09/30 Testing report NO.: 11055C01031-2-2-02-RPT-1
- (4) 2021/11/04~2021/11/30 Testing report NO.: 11055C01031-2-3-02-RPT-1
- (5) 2021/12/01~2021/12/31 Testing report NO.: 11055C01031-2-4-02-RPT-1

II. Descriptions:

1. Date and Location of Test

The test was performed at the site address in table2, ITRI during the period from August 10, 2021 to December 31, 2021.

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.



Test Report

Date Issued: 2022-02-11

Report No .: 11055C01031-2-6-02

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: 日灏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).

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Periou of

Chao Yang Huang

Vice President and General Director Green Energy and Environment Research Laboratories

Department Manager

Commission Information:

Sample name: Pyranometer

Brand name , Model no. , Serial no. ; Refer to table 1

Duration of test: January 01 to January 31, 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 Fax: +886-6-3032029



Approval Signatory

杂洪義

Testing Lab. Head

Test Results and Descriptions:

Information of pyranometer

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

Documentation:

Charles Control of the Control of th	Table 2		
Customer information	日灏能源科技股份有限公司		
Test site address		o. 360, Gaofa 2nd Rd., Guiren 這區號 , Taiwan (R.O.C.) 路 360 號 C 棟屋頂	
Site information	A C D C		
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)		
	Sampling	3 seconds	
Data acquisition timing and	Recording	1 minute	
reporting	Reporting	31 days (2022/01/01~2022/01/31)	
Angle of pyranometer Global horizontal irradiance		ance	



3. Measured parameters:				
Table A				
Measured parameters	Global horizontal	irradiance		
Number of sensor	1 pcs	1 pcs		
Manufacturer	Hukseflux			
Mode/Serial No.	SR30-D1/6586	SR30-D1/6586		
Sensor locations	Pyranometer at the			
Sensor maintenance	Recalibration	(1) Once per year (2) Report No.: <u>N/A</u>		
		Classified		

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工業技術研究
Industrial Technology Research Institute

	Class A	 Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals)
Thermopile pyranometers	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)
	☐ Class C	Any:
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m²
	Class C	Any:
	☐ Class A	Not applicable:
☐ Photodiode sensors	☐ Class B	Not applicable:
	Class C	Any:



Eta Ellep Ellipse, R.	Table B
Measured parameters	Global horizontal irradiance
Number of sensor	1 pcs
Manufacturer	Deltaohm
Mode/Serial No.	PYRA03AC/21013200
Sensor locations	IPPYRA 03 AC S/RI 21013260 4mA



Report No.: 11055C01031-2-6-02

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	Pyranometer at the	red circle
Sensor maintenance	Recalibration	N/A
Sensor type		Classified
	☐ Class A	☐ Secondary standard per ISO 9060☐ High quality per WMO Guide No. 8(Uncertainty ≤ 3 % for hourly totals)
Thermopile pyranometers	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)
	Class C	Any: Second class pyranometer according to ISO 9060.
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty $\leq 8 \%$ from (100 ~1500) W·m ²
	☐ Class C	Any:
	☐ Class A	Not applicable:
☐ Photodiode sensors	☐ Class B	Not applicable:
	☐ Class C	Any:

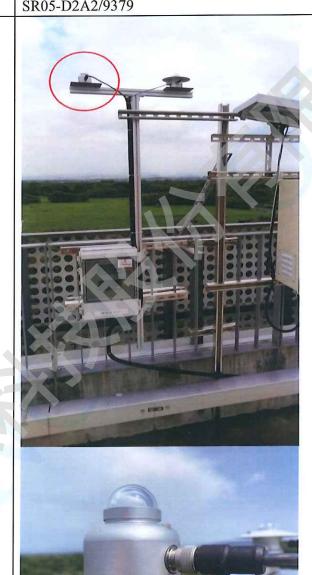


Sensor locations

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Report No.: 11055C01031-2-6-02

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





	Pyranometer at the	e red circle
Sensor maintenance	Recalibration	N/A
Sensor type		Classified
	☐ Class A	 ☐ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals)
Thermopile pyranometers	☐ Class B	 ☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 ☐ (Uncertainty ≤ 8 % for hourly totals)
	Class C	Any: Second class pyranometer according to ISO 9060.
	☐ Class A	Uncertainty $\leq 3 \%$ from (100 ~1500) W·m ²
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m ²
	☐ Class C	Any:
Photodiode sensors	☐ Class A	Not applicable:
	☐ Class B	Not applicable:
	☐ Class C	Any:

4. Test result:

		Module no./SN			
Date I	Duration ^{Note 1}	SR30-D1	LPPYRA03AC	SR05-D2A2	
		6586	21013200	9379	
2022/01/01 ^{Note 2}	06:59:21~17:08:12	4.83	4.68	4.76	
2022/01/02	06:57:00~17:08:00	4.69	4.56	4.64	
2022/01/03	06:56:15~17:09:06	4.66	4.49	4.58	
2022/01/04	07:04:06~17:01:00	3.77	3.65	3.71	
2022/01/05	07:18:30~16:51:45	2.86	2.76	2.81	
2022/01/06	07:21:27~16:49:36	3.06	2.95	2.99	
2022/01/07	07:08:12~17:02:45	4.29	4.18	4.23	
20220/1/08	07:04:21~17:17:48	4.40	4.26	4.35	
2022/01/09	07:00:48~17:19:12	4.59	4.42	4.53	
2022/01/10	06:56:33~17:21:15	4.50	4.35	4.45	
2022/01/11	07:16:12~18:06:27	3.11	3.21	3.06	
2022/01/12	07:09:21~17:23:15	1.98	1.92	1.96	
2022/01/13	06:53:09~17:11:48	4.52	4.39	4.48	
2022/01/14	06:54:27~17:16:03	4.50	4.33	4.43	
2022/01/15	06:57:06~17:21:00	4.61	4.44	4.58	
2022/01/16	06:56:57~17:09:51	4.51	4.37	4.47	
2022/01/17	06:54:51~16:50:06	3.92	3.79	3.86	
2022/01/18	07:15:06~17:20:51	1.79	1.72	1.74	
2022/01/19	07:07:42~17:23:24	3.82	3.73	3.81	
2022/01/20	07:01:33~17:18:03	3.97	3.81	3.89	
2022/01/21	06:56:57~17:20:03	3.45	3.32	3.40	
2022/01/22	07:55:39~16:36:15	1.71	1.65	1.68	
2022/01/23	07:00:42~16:57:15	3.23	3.11	3.21	
2022/01/24	07:32:54~17:17:45	2.56	2.50	2.55	
2022/01/25	06:58:39~17:27:27	4.33	4.20	4.33	
2022/01/26	06:56:24~17:27:27	4.62	4.45	4.61	
2022/01/27	07:25:12~17:24:33	4.35	4.22	4.35	
2022/01/28	07:00:24~16:13:51	1.87	1.79	1.81	
2022/01/29	07:48:36~17:24:03	1.26	1.22	1.22	
2022/01/30	07:06:03~17:03:15	1.88	1.78	1.83	
2022/01/31	07:06:27~17:08:39	4.28	4.20	4.25	
	/01~2022/01/31 ng the irradiance	111.93	108.42	110.59	
Deviation(Be	enchmark:SR30-D1)	N/A	3.14%	1.20%	

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 \geq 20 W/m²) to avoid extraneous night-time data values that introduce errors in analyses, unless such errors have been

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demonstrated to be negligible.

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 January 01, 2022 to January 31, 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.



Test Report

Date Issued: 2022-03-14

Report No .: 11055C01031-2-7-02

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: 日灏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 pages. The validity of this report no longer exists if signature page and content are separated.

Periou of

Chao Yang Huang

General Director Green Energy & Environment Lab Department Manager

Commission Information:

Sample name: Pyranometer

Brand name • Model no. • Serial no. : Refer to table 1 Duration of test : February 01 to February 28, 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 Fax: +886-6-3032029



Approval Signatory

Testing Lab. Head



Test Results and Descriptions:

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	日瀕能源	
Table C	Hukseflux	SR05-D2A2	9379	日瀕能源	

Documentation:

2. Documentation:			
	Table 2		
Customer information	日灏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	A B C		
	A(22°55'15.4"N 120°17		
Latitude , Longitude	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		
	Sampling	3 seconds	
Data acquisition timing and	Recording	1 minute	
reporting	Reporting	28 days (2022/02/01~2022/02/28)	
Angle of pyranometer	Global horizontal irradiance		



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



	Table B
Measured parameters	Global horizontal irradiance
Number of sensor	1 pcs
Manufacturer	Deltaohm
Mode/Serial No.	PYRA03AC/21013200
Sensor locations	IP PYRA 03 AC 5/N 21013200 4mA - 20000/m



	Pyranometer at the	B red circle
Sensor maintenance	Recalibration	N/A
Sensor type		Classified
	☐ Class A	 ☐ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals)
Thermopile pyranometers	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)
	Class C	Any: Second class pyranometer according to ISO 9060.
	Class A	Uncertainty $\leq 3 \%$ from $(100 \sim 1500) \text{ W} \cdot \text{m}^2$
□ PV reference cell□ PV reference module	Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m ²
	☐ Class C	Any:
	☐ Class A	Not applicable:
☐ Photodiode sensors	☐ 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				
	model: Se05-01A ² serial no. 9377 subject: doptal and 432 n			



Pyranometer at the red circle N/A Recalibration Sensor maintenance Classified Sensor type Secondary standard per ISO 9060 High quality per WMO Guide No. 8 Class A (Uncertainty ≤ 3 % for hourly totals) First class per ISO 9060 Thermopile Class B Good quality per WMO Guide No. 8 pyranometers (Uncertainty ≤ 8 % for hourly totals) Any: Second class pyranometer according Class C to ISO 9060. Uncertainty $\leq 3 \%$ from Class A $(100 \sim 1500) \text{ W} \cdot \text{m}^2$ PV reference cell Uncertainty $\leq 8\%$ from Class B $(100 \sim 1500) \text{ W} \cdot \text{m}^2$ PV reference module Class C Any:__ Class A Not applicable:_____ Photodiode sensors Class B Not applicable:_____ Class C Any:_____

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Test result:

4. Test resul	5	Module no./SN			
Date	Duration ^{Note 1}	SR30-D1	LPPYRA03AC	SR05-D2A2	
		6586	21013200	9379	
2022/02/01 ^{Note 2}	07:00:48~17:30:03	3.94	3.83	3.92	
2022/02/02	07:00:15~17:30:06	4.92	4.78	4.90	
2022/02/03	07:03:21~17:25:42	3.28	3.19	3.25	
2022/02/04	07:04:12~17:36:45	4.90	4.80	4.92	
2022/02/05	06:57:24~17:30:21	4.71	4.60	4.67	
2022/02/06	06:47:33~17:37:00	4.68	5.14	5.30	
2022/02/07	07:13:24~17:26:27	3.20	3.10	3.17	
2022/02/08	06:59:24~17:33:37	4.70	4.57	4.69	
2022/02/09	07:20:00~17:37:42	5.10	4.97	5.13	
2022/02/10	06:58:51~17:31:03	4.92	4.81	4.89	
2022/02/11	07:24:36~17:45:15	4.42	4.31	4.32	
2022/02/12	07:00:21~17:39:54	5.11	5.03	5.12	
2022/02/13	07:19:36~17:28:48	3.98	3.80	3.70	
2022/02/14	07:18:42~17:23:03	2.59	2.50	2.56	
2022/02/15	07:13:18~17:26:33	2.69	2.60	2.66	
2022/02/16	06:49:39~17:38:12	5.18	5.55	5.21	
2022/02/17	07:32:33~17:28:51	1.93	1.86	1.86	
2022/02/18	07:35:18~17:42:57	4.30	4.16	4.28	
2022/02/19	06:58:45~16:52:03	3.46	3.37	3.39	
2022/02/20	07:56:09~16:02:00	0.55	0.54	0.52	
2022/02/21	07:41:00~17:19:51	0.81	0.77	0.75	
2022/02/22	07:02:03~16:52:00	2.13	2.06	2.04	
2022/02/23	07:40:42~17:09:57	0.98	0.95	0.93	
2022/02/24	07:11:12~17:23:48	3.22	3.13	3.14	
2022/02/25	06:39:39~17:45:48	5.87	5.69	5.59	
2022/02/26	06:48:36~17:42:18	6.01	5.85	5.85	
2022/02/27	06:47:18~17:48:48	5.73	5.58	5.61	
2022/02/28	06:35:51~17:49:21	6.26	6.02	6.15	
	/01~2022/02/28 ag the irradiance	109.57	107.57	108.51	
Deviation(Benchmark:SR30-D1)		N/A	1.83%	0.97%	

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.

Note 2:Start to tset.



Report No.: 11055C01031-2-7-02



II. Descriptions:

Date and Location of Test
 The test was performed at the site address in table2, ITRI during the period from February 01, 2022 to February 28, 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.





Test Report

Date Issued: 2022-04-12

Report No .: 11055C01031-2-8-02

Version: A

Service Item:	日照計	-累積照度比對	计英文测試報告
---------------	-----	---------	----------------

Brand Name:----

Model(Item No./Style): ----

Serial No.: -----

Client

Company Name: 日灏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 pages. The validity of this report no longer exists if signature page and content are separated.

Jaun Way

Chao Yang Huang

General Director Green Energy & Environment Lab Department Manager

Commission Information:

Sample name: Pyranometer

Brand name · Model no. · Serial no. : Refer to table 1

Duration of test: March 01 to March 31, 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 Fax: +886-6-3032029



Approval Signatory

Testing Lab. Head



Test Results and Descriptions:

Information of pyranometer

1. Information of pyranometer				
			Table 1	
Item	Brand name	Model no.	Serial no.	Provider
				ITRI-GEL-R300-
Table A	Hukseflux	SR30-D1	6586	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:	Documentation:		
	Table 2		
Customer information	日灏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	D C B		
	A(22°55'15.4"N 120°17'29.6"E)		
Latitude , Longitude	B(22°55'13.0"N 120°17'30.6"E)		
Lantude / Longitude	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	31 days (2022/03/01~2022/03/31)	
Angle of pyranometer	Global horizontal irradiance		

2/10



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



Report No.: 11055C01031-2-8-02

本報告屬日灝能源科技股份有限公司所有,請勿複製

	Class A	Secondary standard per ISO 9060☐ High quality per WMO Guide No. 8(Uncertainty ≤ 3 % for hourly totals)
Thermopile pyranometers	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)
	☐ Class C	Any:
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m²
	☐ Class C	Any:
	☐ Class A	Not applicable:
☐ Photodiode sensors	Class B	Not applicable:
	☐ Class C	Any:

Research Institute

属性的原数 自	Table B
Measured parameters	Global horizontal irradiance
Number of sensor	1 pcs
Manufacturer	Deltaohm
Mode/Serial No.	PYRA03AC/21013200
Sensor locations	LP PYRA 03 AC 5/N 21013200 4/na - 0 Wing 20na - 2000W/s

Research Institute

	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: Second class pyranometer according to ISO 9060.	
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m²	
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty $\leq 8 \%$ from (100 ~1500) W·m ²	
	☐ Class C	Any:	
☐ Photodiode sensors	☐ Class A	Not applicable:	
	☐ Class B	Not applicable:	
	☐ Class C	Any:	



NO. THE WAY	Table C
Measured parameters	Global horizontal irradiance
Number of sensor	1 pcs
Manufacturer	Hukseflux
Mode/Serial No.	SR05-D2A2/9379
Sensor locations	
	model: SADS-DJAI servicit rig.; 9273 eutpool: digital and e.30



	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: Second class pyranometer according to ISO 9060.
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty $\leq 8 \%$ from (100 ~1500) W·m ²
	☐ Class C	Any:
Photodiode sensors	☐ Class A	Not applicable:
	☐ Class B	Not applicable:
	Class C	Any:



		Module no./SN			
Date	Duration ^{Note 1}	SR30-D1	LPPYRA03AC	SR05-D2A2	
		6586	21013200	9379	
2022/03/01 ^{Note 2}	07:00:48~17:30:03	5.96	5.71	5.90	
2022/03/02	06:37:00~17:42:54	6.10	5.87	6.09	
2022/03/03	06:46:12~17:40:24	5.79	5.50	5.76	
2022/03/04	06:40:39~17:43:48	5.85	5.56	5.83	
2022/03/05	06:45:09~17:35:15	5.36	5.09	5.35	
2022/03/06	06:43:36~17:38:39	5.41	5.14	5.40	
2022/03/07	07:03:51~17:06:27	1.40	1.33	1.36	
2022/03/08	06:29:42~17:45:00	6.76	6.42	6.75	
2022/03/09	06:28:30~17:44:27	6.67	6.34	6.68	
2022/03/10	06:31:33~17:39:39	6.43	6.11	6.40	
2022/03/11	06:26:51~17:42:27	6.56	6.23	6.53	
2022/03/12	06:30:39~17:38:06	6.39	6.07	6.37	
2022/03/13	06:29:48~17:37:03	6.33	6.01	6.34	
2022/03/14	06:44:45~17:37:48	5.52	5.24	5.53	
2022/03/15	06:36:21~17:42:24	6.11	5.80	6.12	
2022/03/16	06:42:09~17:37:42	5.43	5.16	5.41	
2022/03/17	07:29:21~17:46:24	3.10	2.95	3.08	
2022/03/18	06:36:27~17:53:15	5.59	5.31	5.56	
2022/03/19	06:32:15~17:07:18	4.36	4.17	4.33	
2022/03/20	06:20:36~17:42:12	4.11	3.92	4.07	
2022/03/21	07:18:24~17:48:03	3.64	3.51	3.64	
2022/03/22	06:25:18~17:55:09	5.92	5.62	5.86	
2022/03/23	07:02:57~17:07:09	1.07	1.02	1.04	
2022/03/24	06:23:39~17:28:03	2.27	2.02	2.22	
2022/03/25	06:25:00~18:00:48	6.21	5.45	6.23	
2022/03/26	06:20:36~17:59:00	4.85	4.34	4.82	
2022/03/27	06:15:48~17:34:36	2.84	2.60	2.80	
2022/03/28	06:20:24~16:57:33	2.54	2.35	2.50	
2022/03/29	06:12:48~18:04:18	5.29	4.87	5.26	
2022/03/30	06:17:33~17:45:15	4.21	4.00	4.18	
2022/03/31	06:27:27~17:44:51	6.53	6.20	6.54	
	01~2022/03/31 g the irradiance	154.58	145.93	153.95	
Deviation(Benchmark:SR30-D1)		N/A	5.60%	0.41%	

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 $\geq 20~\text{W/m}^2$) to avoid extraneous night-time data values that introduce errors in analyses, unless such errors have been

A statement to the effect that the results relate only to the items tested, calibrated or sampled. This Report shall not be abridged or copied in any way without the prior written consent of ITRI. When using this Report, please abide by the Report Usage Explanation Agreement inside the cover page. 2022/04/12 08:22:17 637853485373643784





demonstrated to be negligible.

Note 2:Start to tset.

II. Descriptions:

- Date and Location of Test
 The test was performed at the site address in table2, ITRI during the period from March 01, 2022 to March 31, 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.





Test Report

Date Issued: 2022-05-04

Report No .: 11055C01031-2-9-02

Version: A

Service Item:	口服計思穩照角	医比對英文測試報	丛
	日照訂系積照及	比时央义烈武和	D

Brand Name:----

Model(Item No./Style): -----

Serial No.: ----

Client

Company Name: 日灏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 pages. The validity of this report no longer exists if signature page and content are separated.

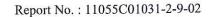
Report

Jaur Way

Chao Yang Huang

General Director Green Energy & Environment Lab

Department Manager





Commission Information:

Sample name: Pyranometer

Brand name · Model no. · Serial no. : Refer to table 1

Duration of test: April 01 to April 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 Fax: +886-6-3032029



Approval Signatory

杂洪義

Testing Lab. Head



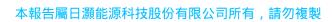
Test Results and Descriptions:

Information of pyranometer

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

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	A B C		
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)		
	Sampling	3 seconds	
Data acquisition timing and	Recording	1 minute	
reporting	Reporting	30 days (2022/04/01~2022/04/30)	
Angle of pyranometer	Global horizontal irradiance		



Research Institute

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.: <u>11107C00444-1-1-03</u>		
Sensor type	Classified		

Report No.: 11055C01031-2-9-02



	Class A	Secondary standard per ISO 9060☐ High quality per WMO Guide No. 8(Uncertainty ≤ 3 % for hourly totals)
Thermopile pyranometers	☐ 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·m ²
	☐ Class B	Uncertainty $\leq 8 \%$ from (100 ~1500) W·m ²
	☐ Class C	Any:
☐ Photodiode sensors	☐ Class A	Not applicable:
	☐ Class B	Not applicable:
	☐ Class C	Any:



	Table B
Measured parameters	Global horizontal irradiance
Number of sensor	1 pcs
Manufacturer	Deltaohm
Mode/Serial No.	PYRA03AC/21013200
Sensor locations	IPPYRA 03 AC 5/N 21013/200 4ma 20ma - 000/W/m



	Pyranometer at the n	red circle
Sensor maintenance	Recalibration	N/A
Sensor type		Classified
	☐ Class A	☐ Secondary standard per ISO 9060☐ High quality per WMO Guide No. 8(Uncertainty ≤ 3 % for hourly totals)
Thermopile pyranometers	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)
	Class C	Any: Second class pyranometer according to ISO 9060.
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m ²
17/7	☐ Class C	Any:
	☐ Class A	Not applicable:
☐ Photodiode sensors	☐ Class B	Not applicable:
	☐ Class C	Any:

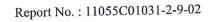




	Table C
Measured parameters	Global horizontal irradiance
Number of sensor	1 pcs
Manufacturer	Hukseflux
Mode/Serial No.	SR05-D2A2/9379
Sensor locations	rede: sloy till water of order and a state of the state o



	Pyranometer at the red circle			
Sensor maintenance	Recalibration	N/A		
Sensor type	His control	Classified		
	☐ Class A	 ☐ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals) 		
Thermopile pyranometers	☐ Class B	 ☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals) 		
	Class C	Any: Second class pyranometer according to ISO 9060.		
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²		
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m ²		
17/7	☐ Class C	Any:		
	☐ Class A	Not applicable:		
☐ Photodiode sensors	☐ Class B	Not applicable:		
	☐ Class C	Any:		

		Module no./SN			
Date	Duration ^{Note 1}	SR30-D1	LPPYRA03AC	SR05-D2A2	
		6586	21013200	9379	
2022/04/01 Note 2	06:24:45~17:13:39	3.35	3.18	3.31	
2022/04/02	06:28:51~17:15:30	1.29	1.23	1.24	
2022/04/03	06:49:33~17:49:00	2.06	1.97	2.00	
2022/04/04	06:04:45~17:59:27	6.97	6.63	6.92	
2022/04/05	06:03:15~18:02:09	7.37	7.10	7.42	
2022/04/06	06:02:00~18:02:57	6.59	6.29	6.58	
2022/04/07	06:11:48~17:49:42	6.19	5.96	6.19	
2022/04/08	06:00:54~17:59:18	5.86	5.51	5.76	
2022/04/09	05:59:12~17:49:45	6.90	6.61	6.94	
2022/04/10	05:57:21~18:01:51	6.88	6.52	6.88	
2022/04/11	06:02:00~17:51:39	4.68	4.42	4.63	
2022/04/12	05:56:57~18:03:36	6.58	6.31	6.60	
2022/04/13	05:56:57~18:03:30	6.13	5.90	6.18	
2022/04/14	05:57:30~18:04:24	6.02	5.77	6.03	
2022/04/15	06:02:42~18:03:00	7.03	6.79	7.06	
2022/04/16	05:58:24~17:59:21	6.51	6.31	6.53	
2022/04/17	06:43:21~17:57:36	5.58	5.39	5.56	
2022/04/18	05:53:09~18:03:36	2.79	2.69	2.80	
2022/04/19	05:54:54~17:56:57	3.11	2.97	3.07	
2022/04/20	05:57:39~17:52:15	5.57	5.36	5.56	
2022/04/21	05:46:51~18:06:21	6.42	6.21	6.33	
2022/04/22	05:45:09~18:07:09	6.46	6.18	6.46	
2022/04/23	05:47:33~18:05:42	3.16	2.97	3.11	
2022/04/24	06:00:03~18:01:36	7.07	6.75	6.89	
2022/04/25	05:49:39~18:05:00	7.68	7.34	7.71	
2022/04/26	06:03:21~18:01:48	7.31	7.03	6.94	
2022/04/27	06:01:45~18:03:03	7.42	7.12	7.36	
2022/04/28	05:44:42~17:59:03	6.18	5.89	6.12	
2022/04/29	06:01:54~18:00:27	7.03	6.88	6.91	
2022/04/30	05:58:00~18:01:57	6.88	6.58	6.65	
Francis (1986)	/01~2022/04/30 ng the irradiance	173.06	165.86	171.74	
	enchmark:SR30-D1)	N/A	4.16%	0.76%	

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 $\geq 20 \text{ W/m}^2$) to avoid extraneous night-time data values that introduce errors in analyses, unless such errors have been demonstrated to be negligible.

A statement to the effect that the results relate only to the items tested, calibrated or sampled This Report shall not be abridged or copied in any way without the prior written consent of ITRI. When using this Report, please abide by the Report Usage Explanation Agreement inside the cover page.



Note 2:Start to tset.

II. Descriptions:

- Date and Location of Test
 The test was performed at the site address in table2, ITRI during the period from April 01, 2022 to April 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.



Test Report

Date Issued: 2022-06-20

Report No .: 11055C01031-2-11-02

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: 日灏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 pages. The validity of this report no longer exists if signature page and content are separated.

chnology Rese

Jan Way

Chao Yang Huang

General Director Green Energy & Environment Lab Department Manager

Report No.: 11055C01031-2-11-02

本報告屬日灝能源科技股份有限公司所有,請勿複製

Commission Information:

Sample name: Pyranometer

Brand name . Model no. . Serial no. : Refer to table 1

Duration of test: May 01 to May 31, 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 Fax: +886-6-3032029



Approval Signatory



Testing Lab. Head

Report No.: 11055C01031-2-11-02



I. Test Results and Descriptions:

1. Information of pyranometer

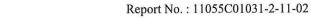
Table 1					
Item	Brand name	Model no.	Serial no.	Provider	
Table A	Hukseflux	SR30-D1	6586	ITRI-GEL-R300- Photovoltaics System Testing Laboratory	
Table B	Deltaohm	PYRA03AC	21013200	日瀕能源	
Table C	Hukseflux	SR05-D2A2	9379	日灏能源	

2. Documentation:

	Table 2			
Customer information	日瀕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	A A	C		
Latitude , Longitude	A(22°55'15.4"N 12 B(22°55'13.0"N 12 C(22°55'13.8"N 12 D(22°55'16.1"N 12	0°17'30.6"E) 0°17'32.8"E)		
	Sampling	3 seconds		
Data acquisition timing and	Recording	1 minute		
reporting	Reporting	31days (2022/05/01~2022/05/31)		
Angle of pyranometer	Global horizontal irradiance			



3. Measured parameters:		
	Table A	
Measured parameters	Global horizontal irr	radiance
Number of sensor	1 pcs	
Manufacturer	Hukseflux	<u> </u>
Mode/Serial No.	SR30-D1/6586	
Sensor locations		B C C
Sensor maintenance	Pyranometer at the Recalibration	(1) Once per year (2) Report No.: 11107C00444-1-1-03
Sensor type	PUNT BY	Classified





	Class A	Secondary standard per ISO 9060☐ High quality per WMO Guide No. 8(Uncertainty ≤ 3 % for hourly totals)	
Thermopile pyranometers	☐ Class B	 ☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals) 	
	☐ Class C	Any:	
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²	
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m²	
	☐ Class C	Any:	
	☐ Class A	Not applicable:	
☐ Photodiode sensors	Class B	Not applicable:	
	Class C	Any:	

	Table B		
Measured parameters	Global horizontal irradiance		
Number of sensor	1 pcs		
Manufacturer	Deltaohm		
Mode/Serial No.	PYRA03AC/21013200		
Sensor locations	LP PYRA 03 AC S/N 21013200 4mA → 0 W/m² 20mA → 200/m²		



	Pyranometer at the	red circle
Sensor maintenance	Recalibration	N/A
Sensor type	REPRESENTED.	Classified
	☐ Class A	 ☐ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals)
Thermopile pyranometers	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)
	Class C	Any: Second class pyranometer according to ISO 9060.
	Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²
□ PV reference cell□ PV reference module	Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m ²
	☐ Class C	Any:
	☐ Class A	Not applicable:
☐ Photodiode sensors	☐ Class B	Not applicable:
	☐ Class C	Any:

	Table C
Measured parameters	Global horizontal irradiance
Number of sensor	1 pcs
Manufacturer	Hukseflux
Mode/Serial No.	SR05-D2A2/9379
Sensor locations	
	model: \$805 D3A1 words no.1 9779 volume: doctor and a 36 m



	Pyranometer at the red circle			
Sensor maintenance	Recalibration	N/A		
Sensor type		Classified		
	☐ Class A	 ☐ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals) 		
Thermopile pyranometers	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)		
	Class C	Any: Second class pyranometer according to ISO 9060.		
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²		
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m ²		
	☐ Class C	Any:		
	☐ Class A	Not applicable:		
☐ Photodiode sensors	☐ Class B	Not applicable:		
	☐ Class C	Any:		



4. Test result:

			Module no./SN			
Date	Duration ^{Note 1}	SR30-D1	LPPYRA03AC	SR05-D2A2		
		6586	21013200	9379		
2022/05/01 ^{Note 2}	05:39:18~17:59:24	3,22	3.07	3.18		
2022/05/02	06:31:15~17:35:21	1.08	1.04	1.06		
2022/05/03	06:09:51~17:47:21	2.52	2.37	2.46		
2022/05/04	05:54:27~18:05:51	6.77	6.42	6.71		
2022/05/05	06:05:03~18:12:33	6.59	6.28	6.55		
2022/05/06	05:56:09~18:04:39	6.09	5.81	6.05		
2022/05/07	05:39:51~18:01:27	5.60	5.32	5.55		
2022/05/08	05:48:51~18:11:21	4.70	4.46	4.64		
2022/05/09	05:58:18~18:02:36	5.00	4.73	4.97		
2022/05/10	05:40:42~17:47:09	6.43	6.12	6.39		
2022/05/11	05:55:06~17:59:09	2.81	2.66	2.78		
2022/05/12	05:46:15~17:43:00	2.18	2.07	2.15		
2022/05/13	05:46:54~17:59:21	3.58	3.40	3.54		
2022/05/14	07:06:54~17:20:12	0.88	0.85	0.88		
2022/05/15	05:48:33~16:47:24	1.96	1.88	1.93		
2022/05/16	06:00:18~17:11:36	1.48	1.44	1.45		
2022/05/17	05:48:54~18:18:42	4.61	4.43	4.57		
2022/05/18	05:52:27~18:06:00	5.87	5.59	5.83		
2022/05/19	05:49:36~18:14:33	6.57	6.27	6.55		
2022/05/20	05:34:21~18:11:36	6.99	6.69	7.00		
2022/05/21	05:34:48~18:09:27	6.46	6.17	6.45		
2022/05/22	05:44:54~18:22:03	4.81	4.56	4.76		
2022/05/23	05:32:48~18:06:09	4.23	4.00	4.19		
2022/05/24	05:33:45~18:15:39	2.33	2.23	2.32		
2022/05/25	06:06:33~18:02:51	4.17	3.94	4.12		
2022/05/26	05:24:03~18:05:48	3.24	3.09	3.21		
2022/05/27	06:12:51~18:05:12	2.80	2.65	2.77		
2022/05/28	05:29:24~18:27:30	7.39	7.06	7.38		
2022/05/29	05:30:24~18:23:24	7.34	6.99	7.31		
2022/05/30	05:33:15~18:25:24	5.94	5.66	5.93		
2022/05/31	05:33:03~18:24:33	7.16	6.83	7.16		
2022/0	5/01~2022/05/31 ing the irradiance	140.81 kWh/m²	134.06 kWh/m ²	139.85 kWh/m²		
	Benchmark:SR30-D1)	N/A	4.79 %	0.68 %		

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



Report No.: 11055C01031-2-11-02



demonstrated to be negligible.

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 May 01,
2022 to May 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.



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: 日灏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 pages. The validity of this report no longer exists if signature page and content are separated.

Jaun Way

Chao Yang Huang

General Director Green Energy & Environment Lab

Department Manager

Report No.: 11055C01031-2-12-02

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 Fax: +886-6-3032029



Approval Signatory



Testing Lab. Head

Report No.: 11055C01031-2-12-02



I. Test Results and Descriptions:

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	日瀕能源
Table C	Hukseflux	SR05-D2A2	9379	日瀕能源

2. Documentation:

2. Documentation:		
	Table 2	
Customer information	日灏能源科技股份有同	限公司
Test site address		o. 360, Gaofa 2nd Rd., Guiren 區號 , Taiwan (R.O.C.) 咯 360 號 C 棟屋頂
Site information	A	DC
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)	
	Sampling	3 seconds
Data acquisition timing and	Recording	1 minute
reporting	Reporting	30days (2022/06/01~2022/06/30)
Angle of pyranometer	Global horizontal irradiance	

3. Measured parameters:	14		
	Table A		
Measured parameters	Global horizontal irr	adiance	
Number of sensor	1 pcs		
Manufacturer	Hukseflux		
Mode/Serial No.	SR30-D1/6586		
Sensor locations	Pyranometer at the		
Sensor maintenance	Recalibration	(1) Once per year (2) Report No.: 11107C00444-1-1-03	
Sensor type		Classified	



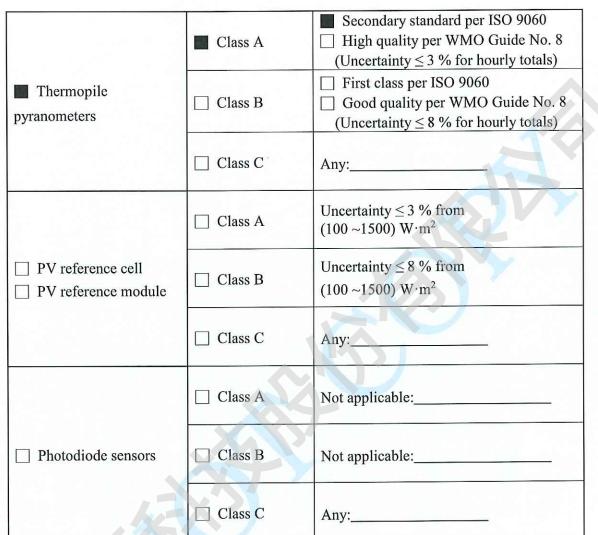






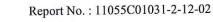
	Table B		
Measured parameters	Global horizontal irradiance		
Number of sensor	1 pcs		
Manufacturer	Deltaohm		
Mode/Serial No.	PYRA03AC/21013200		
Sensor locations	LP PYRA 03 AC 5/N 210132/0 4na - 0 W/m 20na - 200W/s		



	Pyranometer at the r	B red circle
Sensor maintenance	Recalibration	N/A
Sensor type		Classified
	☐ Class A	 ☐ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals)
Thermopile pyranometers	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)
	Class C	Any: Second class pyranometer according to ISO 9060.
	Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²
☐ PV reference cell ☐ PV reference module	☐ Class B	Uncertainty $\leq 8 \%$ from (100 ~1500) W·m ²
	☐ Class C	Any:
	☐ Class A	Not applicable:
☐ Photodiode sensors	☐ Class B	Not applicable:
	☐ Class C	Any:



	Table C
Measured parameters	Global horizontal irradiance
Number of sensor	1 pcs
Manufacturer	Hukseflux
Mode/Serial No.	SR05-D2A2/9379
Sensor locations	Finder BEST DIV. Walker: 1977 and 1977 Walker: 1977 and 1977 Walker: 1977 and 1977





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



		Module no./SN			
Date	Duration ^{Note 1}	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	
2022/0	6/01~2022/06/30 ing the irradiance	181.24 kWh/m²	171.62 kWh/m ²	180.58 kWh/m	
	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 $\geq 20~\text{W/m}^2$) to avoid extraneous night-time data values that introduce errors in analyses, unless such errors have been demonstrated to be negligible.



Report No.: 11055C01031-2-12-02



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.





Test Report

Date Issued: 2022-08-04

Report No .: 11055C01031-2-13-02

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: 日瀬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 pages. The validity of this report no longer exists if signature page and content are separated.

Jans Way

Chao Yang Huang

General Director Green Energy & Environment Lab

Department Manager

Report No.: 11055C01031-2-13-02

Commission Information:

Sample name: Pyranometer

Brand name . Model no. . Serial no. : Refer to table 1

Duration of test: July 01 to July 31, 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 Fax: +886-6-3032029



Approval Signatory

杂洪義

Testing Lab. Head

Test Results and Descriptions:

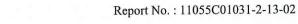
Information of pyranometer

			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	日瀕能源
Table C	Hukseflux	SR05-D2A2	9379	日瀕能源

Documentation:

2. Documentation:			
	Table 2		
Customer information	日瀕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	D C B		
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)		
	Sampling	3 seconds	
Data acquisition timing and	Recording	1 minute	
reporting	Reporting	31 days (2022/07/01~2022/07/31)	
Angle of pyranometer	Global horizontal irradiance		

Measured parameters Number of sensor 1 pcs Manufacturer Hukseflux Mode/Serial No. SR30-D1/6586 Sensor locations Sensor locations	3. Measured parameters:	Table A			
Number of sensor 1 pcs Manufacturer Hukseflux Mode/Scrial No. SR30-D1/6586 Sensor locations	Measured parameters	Global horizontal in	radiance		
Sensor locations Sensor locations		1 pcs			
Sensor locations D C C	Manufacturer	Hukseflux	A		
A B B	Mode/Serial No.	SR30-D1/6586	A V		
	Sensor locations	Pyranometer at the	red circle		
(1) Once per year	Sensor maintenance				





	Class A	Secondary standard per ISO 9060☐ High quality per WMO Guide No. 8(Uncertainty ≤ 3 % for hourly totals)	
Thermopile pyranometers	☐ Class B	 ☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals) 	
	☐ Class C	Any:	
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m²	
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m²	
	☐ Class C	Any:	
	☐ Class A	Not applicable:	
☐ Photodiode sensors	Class B	Not applicable:	
74.5	Class C	Any:	



MATERIAL PROPERTY.	Table B		
Measured parameters	Global horizontal irradiance		
Number of sensor	1 pcs		
Manufacturer	Deltaohm		
Mode/Serial No.	PYRA03AC/21013200		
Sensor locations	LP PYRA 03 AC S/N 21013200 4mA - 1007/ms 20ma - 2007/ms		

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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			





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

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Test result:

			Module no./SN			
Date	DurationNote 1	SR30-D1	LPPYRA03AC	SR05-D2A2		
		6586	21013200	9379		
2022/07/01 Note 2	05:38:51~16:02:18	4.33	4.11	4.32		
2022/07/02	05:45:39~18:27:36	3.43	3.26	3.13		
2022/07/03	05:43:03~18:27:48	4.55	4.33	4.45		
2022/07/04	05:34:45~18:23:30	4.97	4.72	4.91		
2022/07/05	05:53:51~17:24:03	3.22	3.06	3.19		
2022/07/06	05:07:21~18:26:15	6.92	6.56	6.90		
2022/07/07	05:13:54~18:01:12	6.27	5.96	6.17		
2022/07/08	05:49:33~17:59:54	4.86	4.62	4.77		
2022/07/09	05:02:12~18:33:36	7.05	6.69	6.99		
2022/07/10	05:01:00~18:33:36	7.51	7.12	7.45		
2022/07/11	05:01:27~18:36:45	7.62	7.21	7.60		
2022/07/12	05:05:39~18:29:39	7.18	6.82	7.10		
2022/07/13	05:59:48~18:36:21	5.49	5.22	5.48		
2022/07/14	07:24:27~17:41:30	2.93	2.78	2.83		
2022/07/15	06:12:48~18:03:03	3.07	2.91	3.04		
2022/07/16	06:01:03~18:00:21	4.04	3.83	3.94		
2022/07/17	06:24:09~18:07:42	4.72	4.49	4.69		
2022/07/18	05:27:27~18:16:18	6.40	6.09	6.31		
2022/07/19	05:08:57~18:22:51	6.88	6.53	6.82		
2022/07/20	05:26:42~18:38:09	7.85	7.45	7.79		
2022/07/21	05:31:18~18:15:12	6.57	6.25	6.56		
2022/07/22	05:27:06~17:45:51	6.81	6.46	6.79		
2022/07/23	05:02:54~18:39:42	7.71	7.31	7.61		
2022/07/24	06:03:27~18:16:30	5.96	5.65	5.88		
2022/07/25	05:18:42~18:18:24	6.51	6.19	6.46		
2022/07/26	05:21:03~18:16:00	6.41	6.09	6.30		
2022/07/27	05:32:33~18:06:06	6.10	5.79	5.90		
2022/07/28	05:06:27~18:29:48	7.05	6.68	6.95		
2022/07/29	05:26:36~18:21:18	6.65	6.29	6.45		
2022/07/30	05:55:06~17:21:33	3.81	3.62	3.61		
2022/07/31	05:09:06~18:08:51	6.38	6.07	6.18		
2022/07	/01~2022/07/31 ng the irradiance	179.27 kWh/m²	170.17 kWh/m²	176.58 kWh/m		
	enchmark:SR30-D1)	N/A	5.08 %	1.50 %		

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 $\geq 20~\text{W/m}^2$) to avoid extraneous night-time data values that introduce errors in analyses, unless such errors have been



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demonstrated to be negligible.

Note 2:Start to tset.

II. Descriptions:

Date and Location of Test
 The test was performed at the site address in table2, ITRI during the period from July 01, 2022 to July 31, 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.



Test Report

Date Issued: 2022-09-06

Report No .: 11055C01031-2-14-02

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: 日瀬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 pages. The validity of this report no longer exists if signature page and content are separated.

Jan Way

Chao Yang Huang

General Director
Green Energy & Environment Lab

Department Manager

Report No.: 11055C01031-2-14-02

本報告屬日灝能源科技股份有限公司所有,請勿複製

Commission Information:

Sample name: Pyranometer

Brand name · Model no. · Serial no. : Refer to table 1

Duration of test: August 01 to August 31, 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 Fax: +886-6-3032029



Approval Signatory

Testing Lab. Head





I. Test Results and Descriptions:

1. Information of pyranometer

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

2. Documentation:

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	A C C			
12//	A(22°55'15.4"N 120°17	7'29.6"E)		
Latitude, Longitude	B(22°55'13.0"N 120°17'30.6"E)			
Eatitude Dongitude	C(22°55'13.8"N 120°17'32.8"E)			
	D(22°55'16.1"N 120°17'31.8"E)			
	Sampling	3 seconds		
Data acquisition timing and	Recording	1 minute		
reporting	Reporting	31 days (2022/08/01~2022/08/31)		
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			
	A B		
	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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	Class A	Secondary standard per ISO 9060☐ High quality per WMO Guide No. 8(Uncertainty ≤ 3 % for hourly totals)	
Thermopile pyranometers	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)	
	☐ Class C	Any:	
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²	
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty ≤ 8 % from (100 ~1500) W·m ²	
	☐ Class C	Any:	
	☐ Class A	Not applicable:	
☐ Photodiode sensors	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	IP PYRA 03 AC S/N 21013200 4mA - 2000W/m 20ma - 2000W/m



J V	Pyranometer at the	e red circle
Sensor maintenance	Recalibration	N/A
Sensor type		Classified
	☐ Class A	 ☐ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals)
Thermopile pyranometers	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)
· v	Class C	Any: Second class pyranometer according to ISO 9060.
	☐ Class A	Uncertainty ≤ 3 % from (100 ~1500) W·m ²
□ PV reference cell□ PV reference module	☐ Class B	Uncertainty $\leq 8 \%$ from (100 ~1500) W·m ²
5-12	☐ Class C	Any:
	☐ Class A	Not applicable:
Photodiode sensors	☐ Class B	Not applicable:
	☐ Class C	Any:



Industrial Technology Research Institute

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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	



	Pyranometer at the red circle		
Sensor maintenance	Recalibration	N/A	
Sensor type	EVERY	Classified	
	☐ Class A	☐ Secondary standard per ISO 9060 ☐ High quality per WMO Guide No. 8 (Uncertainty ≤ 3 % for hourly totals)	
Thermopile pyranometers	☐ Class B	☐ First class per ISO 9060 ☐ Good quality per WMO Guide No. 8 (Uncertainty ≤ 8 % for hourly totals)	
v.	Class C	Any: Second class pyranometer according to ISO 9060.	
	☐ Class A	Uncertainty $\leq 3 \%$ from (100 ~1500) W·m ²	
□ PV reference cell□ PV reference module	Class B	Uncertainty $\leq 8 \%$ from (100 ~1500) W·m ²	
	☐ Class C	Any:	
	☐ Class A	Not applicable:	
Photodiode sensors	☐ Class B	Not applicable:	
	☐ Class C	Any:	



4. Test result:

		Module no./SN			
Date	Duration ^{Note 1}	SR30-D1	LPPYRA03AC	SR05-D2A2	
		6586	21013200	9379	
2022/08/01 ^{Note 2}	05:42:33~18:30:39	3.83	3.43	3.82	
2022/08/02	07:29:33~17:01:03	1.76	1.56	1.76	
2022/08/03	05:54:18~17:20:12	3.56	3.31	3.52	
2022/08/04	05:18:00~17:55:18	5.99	5.59	5.91	
2022/08/05	05:22:30~18:18:06	6.28	5.88	6.26	
2022/08/06	05:58:48~18:20:24	5.38	5.20	5.34	
2022/08/07	05:51:54~17:26:27	3.83	3.43	3.80	
2022/08/08	05:12:51~18:02:24	6.30	5.90	6.29	
2022/08/09	05:32:51~16:00:21	4.03	3.63	4.00	
2022/08/10	05:31:00~18:07:09	6.10	5.70	6.08	
2022/08/11	00:00:00~00:00:00	5.14	4.74	5.14	
2022/08/12	05:49:18~18:12:27	5.55	5.15	5.53	
2022/08/13	05:40:00~18:20:51	5.99	5.88	5.89	
2022/08/14	05:39:36~18:18:21	5.89	5.49	5.88	
2022/08/15	06:00:00~17:16:21	3.24	2.84	3.20	
2022/08/16	05:55:03~18:18:48	5.36	4.96	5.31	
2022/08/17	06:23:12~18:01:45	4.91	4.51	4.89	
2022/08/18	07:08:00~17:05:39	2.51	2.11	2.49	
2022/08/19	05:52:03~18:13:00	7.40	7.23	7.38	
2022/08/20	05:51:39~18:15:48	7.46	7.06	7.45	
2022/08/21	05:52:33~18:13:51	6.97	6.61	6.98	
2022/08/22	05:57:12~18:07:15	7.18	6.79	7.17	
2022/08/23	06:02:57~18:01:03	6.69	6.30	6.67	
2022/08/24	06:25:27~17:25:30	3.12	2.73	3.10	
2022/08/25	05:55:39~18:08:42	7.28	7.00	7.28	
2022/08/26	05:53:21~18:04:03	7.15	6.89	7.14	
2022/08/27	06:04:00~17:59:24	6.55	6.16	6.54	
2022/08/28	05:50:39~17:27:54	3.86	3.47	3.86	
2022/08/29	05:43:09~18:13:33	5.70	5.31	5.68	
2022/08/30	05:40:24~18:19:03	5.86	5.47	5.81	
2022/08/31	05:50:27~18:11:51	5.18	4.79	5.10	
	/01~2022/08/31 g the irradiance	166.08 kWh/m ²	155.14 kWh/m ²	165.26 kWh/m	
Deviation(Be	enchmark:SR30-D1)	N/A	6.58 %	0.49 %	

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 $\geq 20~\text{W/m}^2$) to avoid extraneous night-time data values that introduce errors in analyses, unless such errors have been

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demonstrated to be negligible.

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- Date and Location of Test
 The test was performed at the site address in table2, ITRI during the period from August 01, 2022 to August 31, 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.