Photometric Test Report

Relevant Standards

☑IES LM-79-2008

☑ANSI C82.77:2017

Prepared For

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Issue Date

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Prepared By	**Approved By**
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1.0 Test Summary

DLC Technical Requirements v5.0

T8 Two-Foot Linear Replacement Lamps 2-lamp External Driver Lamp-Style Retrofit Kits (UL Type C)				
Requirement Category	**Test Method**	**Requirements**		**Test value**
Luminaire Output (lm)	IES LM-79-2008	800		1331
Luminaire Efficacy (lm/W)	IES LM-79-2008	120		133.3
Beam Angle	IES LM-79-2008	⩾140		196.4
Total Harmonic Distortion (A%)	ANSI C82.77:2014	20%	120V	6.78%
			277V	11.70%
Power Factor	ANSI C82.77:2014	0.9	120V	0.993
			277V	0.934
Lamp light output (lm)	IES LM-79-2008 CIE 13.3-1995	800		1345
				1406
Lamp Efficacy (lm/W)	IES LM-79-2008 CIE 13.3-1995	120		133.17
				136.50
Allowable CCTs* (K)	IES LM-79-2008	7 step	3045±175	3007
		7 step	5029±355	5017
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾80		82
				83
Minimum R9	IES LM-79-2008 CIE 13.3-1995	⩾0		3
				6
Minimum Rf	ANSI/IES TM-30-18	⩾70		84
				84
Minimum Rg	ANSI/IES TM-30-18	⩾89		96
				96
IES Rcs,h1	ANSI/IES TM-30-18	-12%⩽IES Rcs,h1⩽+23%		-12%
				-12%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/9/24	L24T8/830/8P-XT (2N)	A1
			L24T8/850/8P-XT (2N)	A2
2	Goniophotometer Test	2021/9/24	L24T8/830/8P-XT (2N)	A1
3	THD and PF Test	2021/9/24	L24T8/830/8P-XT (2N)	A1
			L24T8/850/8P-XT (2N)	A2

Remark(If any)
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2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

3.0 Production Description

Luminaire Description: L24T8/830/8P-XT (2N)

Electrical Specification: 120-277V,60HZ

Fixture：

Photos of Luminaire Characteristics

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test - 3000K

Model No.	L24T8/830/8P-XT (2N)	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	70
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
276.98	60	0.039	10.1	0.934

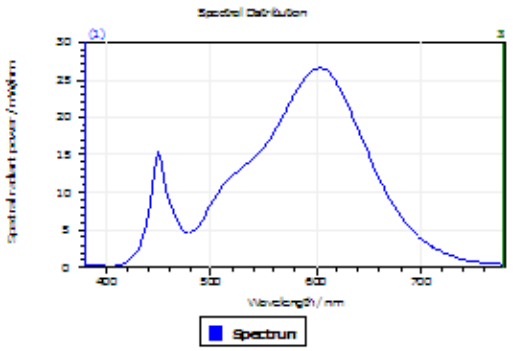
Test Result

CCT (K)	CRI	R9	Duv	THD
3007	82	3	0.00077	11.70%

Rf	Rg	IES Rcs,h1	Lamp Light Output (lm)	Lamp Efficacy (lm/W)
84	96	-12%	1345	133.17

4.1 Integrating Sphere Test

Results



Spectral Distribution

Spectral values

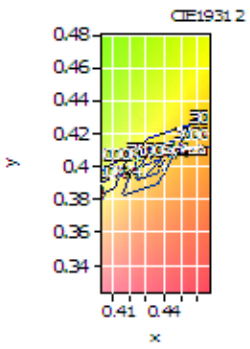
DominantWavelength	583.07 nm
Purity	0.512
PeakWavelength	602.87 nm
Radiant Power	3.909 W
Width50%:	

Color Coordinates

Correlated Color Temperat		3007 K		
x:	0.4353	u: 0.2506	u':	0.2506
y:	0.4016	v: 0.3468	v':	0.5202

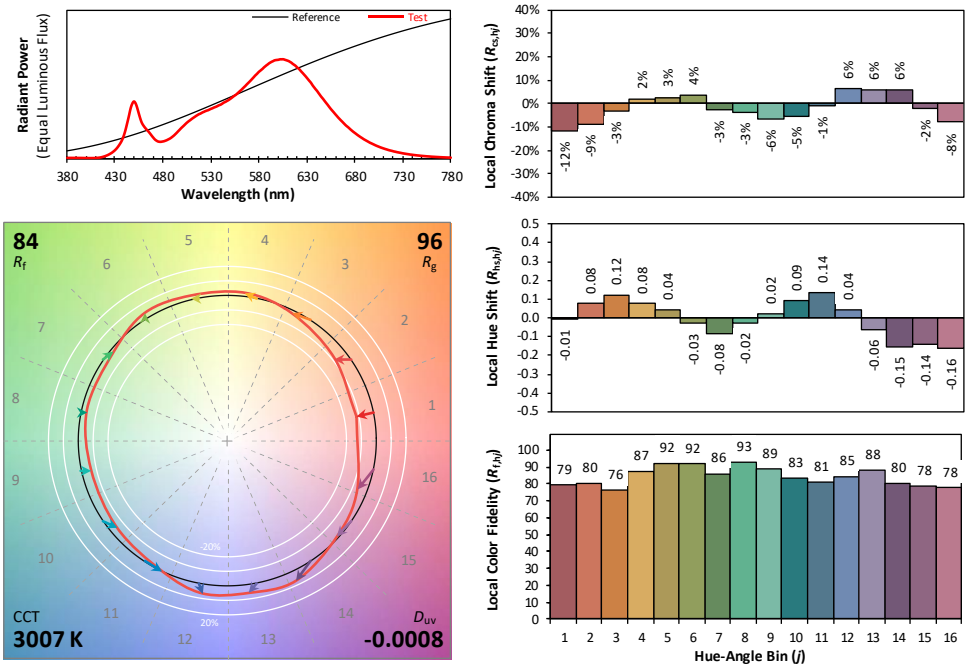
CRI01	80.0	CRI09	3.0
CRI02	90.4	CRI10	78.3
CRI03	96.2	CRI11	79.6
CRI04	80.0	CRI12	71.3
CRI05	80.6	CRI13	82.5
CRI06	88.6	CRI14	98.5
CRI07	81.8	CRI15	72.3
CRI08	57.1	CRI16	69.9

ResultsCRI 81.8



PlanckDistance 7.7E-004

4.1 Integrating Sphere Test



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4353
y	0.4016
u'	0.2506
v'	0.5202

CIE 13.3-1995 (CRI)

R_a	82
R_9	4

lors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test - 5000K

Model No.	L24T8/850/8P-XT (2N)	Sample ID.	A2
Opreate time (Min.)	90	Stabilization time (Min.)	70
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
276.95	60	0.040	10.3	0.935

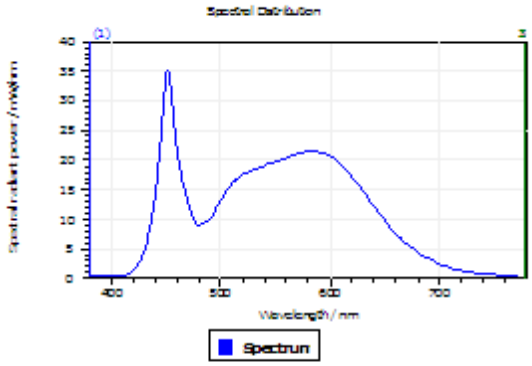
Test Result

CCT (K)	CRI	R9	Duv	THD
5017	83	6	0.0023	11.47%

Rf	Rg	IES Rcs,h1	Lamp Light Output (lm)	Lamp Efficacy (lm/W)
84	96	-12%	1406	136.50

4.1 Integrating Sphere Test

Results



Spectral Distribution

Spectral values

DominantWavelength	570.28 nm
Purity	0.105
PeakWavelength	451.57 nm
Radiant Power	4.202 W
Width50%:	

Color Coordinates

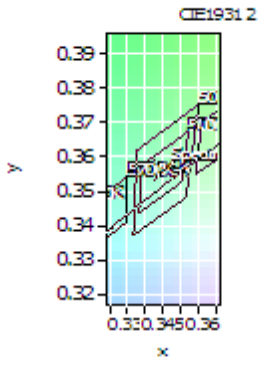
Correlated Color Temperat 5017 K

x: 0.3451 u: 0.2096 u': 0.2096

y: 0.3562 v: 0.3246 v': 0.4869

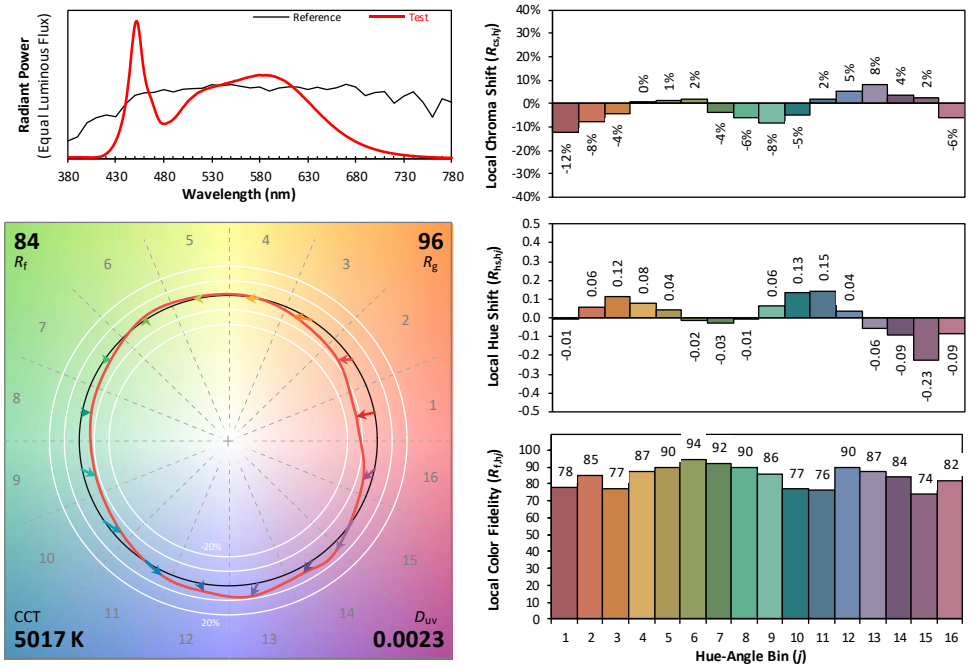
CRI01	81.2	CRI09	5.6
CRI02	88.8	CRI10	73.4
CRI03	93.6	CRI11	82.0
CRI04	82.6	CRI12	62.8
CRI05	82.2	CRI13	83.3
CRI06	84.4	CRI14	96.8
CRI07	86.3	CRI15	75.3
CRI08	66.0	CRI16	73.2

ResultsCRI 83.2



PlanckDistance 2.3E-003

4.1 Integrating Sphere Test



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3451
y	0.3562
u'	0.2096
v'	0.4869

CIE 13.3-1995 (CRI)

R_a	83
R_9	6

lors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test - 3000K

Model No.	L24T8/830/8P-XT (2N)	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	70
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

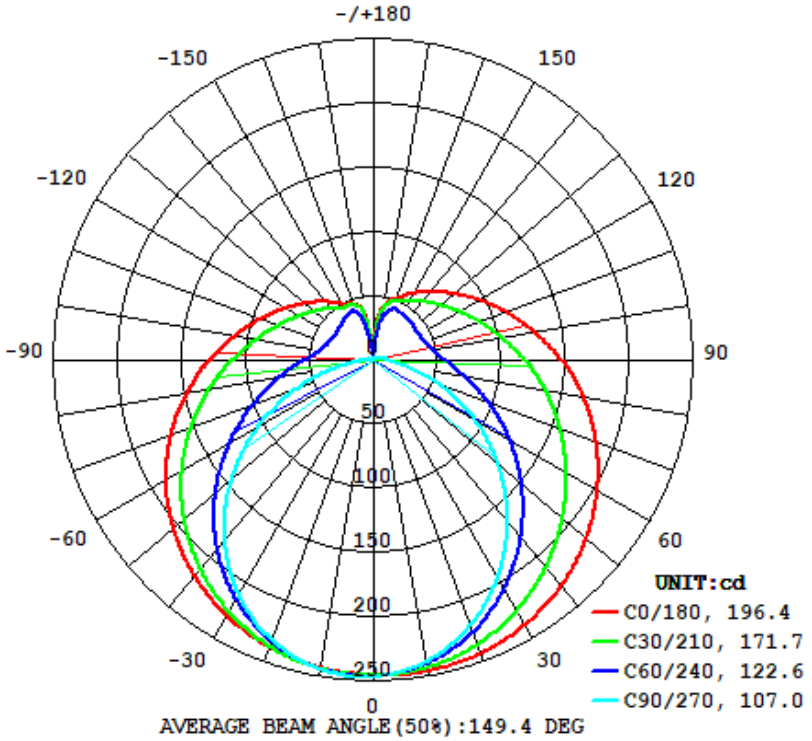
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WROST CASE	277.08	60	0.039	10.0	0.935

Test Result

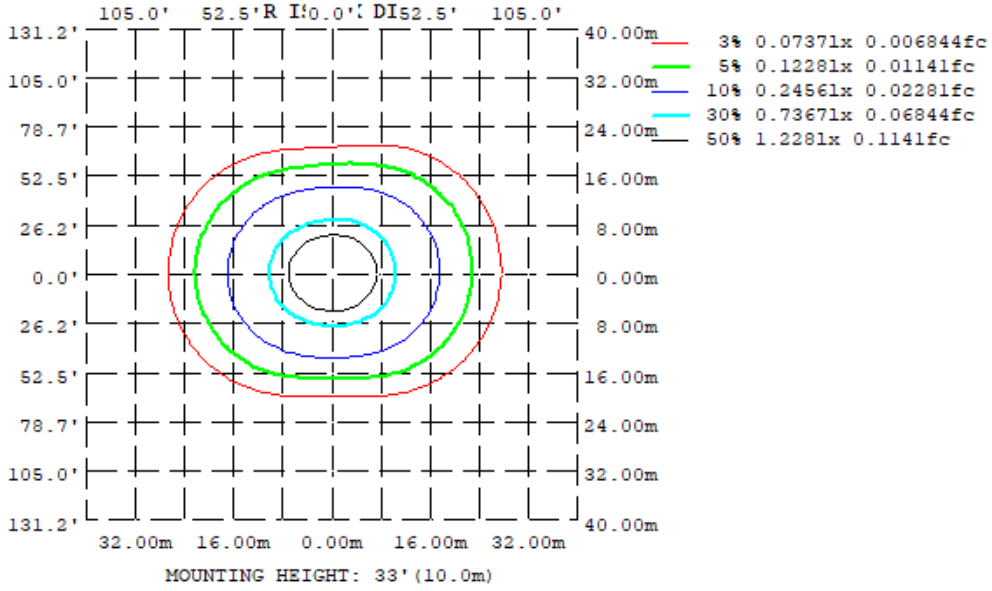
Flux (lm)	Luminous Efficacy (lm/W)	Beam Angle
1331	133.3	196.4

4.2 Goniophotometer Test

Zonal Lumen Summary



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	ηlum,lamp
10	245.6	241.0	238.0	239.8	243.1	243.7	244.4	246.2	0- 10	23.32	23.32	1.75,1.75
20	243.0	230.3	220.3	227.8	237.9	235.4	232.5	240.4	10- 20	67.50	90.82	6.83,6.83
30	237.3	214.4	194.9	210.9	229.7	220.8	211.0	228.9	20- 30	104.6	195.4	14.7,14.7
40	228.7	194.7	163.7	190.6	218.5	201.4	181.5	212.5	30- 40	131.1	326.6	24.5,24.5
50	217.0	172.7	128.3	168.1	204.4	178.6	145.3	192.7	40- 50	145.2	471.7	35.5,35.5
60	202.3	149.9	90.89	144.8	187.4	154.0	105.6	171.0	50- 60	146.5	618.2	46.5,46.5
70	185.4	127.9	53.71	122.2	168.5	129.2	63.59	148.8	60- 70	137.0	755.2	56.8,56.8
80	166.8	108.1	22.92	101.9	148.5	106.5	24.76	127.7	70- 80	119.9	875.1	65.8,65.8
90	147.6	91.55	10.59	84.77	129.0	87.52	2.178	109.0	80- 90	100.6	975.8	73.3,73.3
100	128.6	78.31	10.63	71.37	111.1	72.78	6.797	93.20	90-100	84.49	1060	79.7,79.7
110	111.0	68.18	5.981	61.47	95.22	62.03	5.258	80.49	100-110	70.85	1131	85,85
120	95.31	60.78	3.013	54.37	81.41	54.67	0.7975	70.44	110-120	58.44	1190	89.4,89.4
130	81.51	55.62	3.829	49.45	69.84	49.20	0.2786	62.83	120-130	47.55	1237	93,93
140	69.96	51.49	3.004	45.81	60.00	45.97	0.3444	55.60	130-140	37.52	1275	95.8,95.8
150	60.45	49.02	1.222	44.15	51.54	45.35	0.3567	51.97	140-150	27.66	1302	97.9,97.9
160	51.22	46.85	0.3986	41.03	47.31	44.39	2.084	45.06	150-160	18.29	1321	99.2,99.2
170	41.08	35.64	0.3440	10.50	29.30	24.25	3.121	29.37	160-170	8.863	1329	99.9,99.9
180	0.2553	0.2821	0.2708	0.2465	0.2453	0.2689	0.2891	0.2612	170-180	1.146	1331	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	L24T8/830/8P-XT (2N)	Sample ID.	A1
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
119.93	60	0.084	10.0	0.993	6.78%
276.98	60	0.039	10.1	0.934	11.70%

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	L24T8/850/8P-XT (2N)	Sample ID.	A2
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.01	60	0.085	10.1	0.993	6.76%
276.95	60	0.040	10.3	0.935	11.47%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2020/12/26	2021/12/25
DLF108	Auxiliary Lamp	2020/12/26	2021/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF116	AC Power Source	2020/12/26	2021/12/25
DLF113	Power Meter	2020/12/26	2021/12/25
DLF112	Temperature Recorder	2020/12/26	2021/12/25
DLF114	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF101	Goniophotometer	2020/12/26	2021/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF104	AC Power Source	2020/12/26	2021/12/25
DLF507	DC Power Source	2020/12/26	2021/12/25
DLF102	Power Meter	2020/12/26	2021/12/25
DLF111	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF119	Power Meter	2020/12/26	2021/12/25
DLF031	Temperature data logger	2020/12/26	2021/12/25
DLF022	Digital power meter	2020/12/26	2021/12/25
DLF003	Temperature & Humidity Datalogger	2020/12/26	2021/12/25

********** End of Test Report**********