

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

Performance Testing for Luminaires

MODEL NUMBER

E3SRF-LOWD4A w/ E3SLB-OW

PROJECT NUMBER

G104622548

REPORT NUMBER

104622548CRT-012

ISSUE DATE

9/21/2021

REVISED DATE

None

TEST DATES

9/16/2021

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER
104622548CRT-012

MODEL NUMBER(s)
E3SRF-LOWD4A w/ E3SLB-OW

REPORT RENDERED TO:
VISUAL COMFORT AND COMPANY
7400 LINDER AVE
SKOKIE, IL 60077
USA

STATEMENT OF LIMITATION

NVLAP Lab Code 100402-0. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION

The testing performed was authorized by signed quote number Qu-01154433-0.

TEST STANDARDS

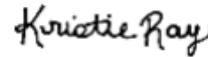
IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting
ANSI NEMA ANSLG C78.377: 2017: Specifications of the Chromaticity of Solid State Lighting Products

In Charge of Testing:



Gerald Gray
Associate Engineer
Lighting Division

Reviewer:



Kristie Ray
Team Lead, Engineering
Lighting Division

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SAMPLE INFORMATION

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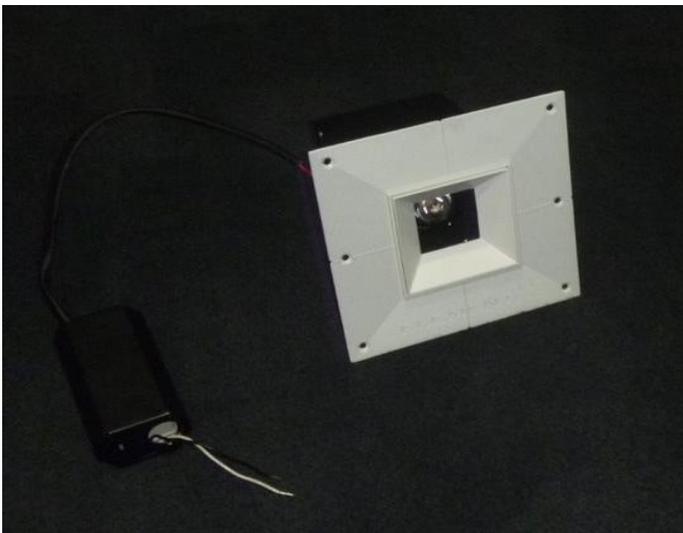
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2109100744-001-2	--	Housing w/PTB15W-0300-38-VCC	Production	9/10/2021
2	CRT2109100744-001-6	--	40° Lens	Production	9/10/2021
3	CRT2109100744-001-12	--	Warm Dim LED	Production	9/10/2021
4	CRT2109100744-001-19	--	Trim No Lens	Production	9/10/2021

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	E3SRF-LOWD4A w/ E3SLB-OW	1,2,3,4

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	E3SRF-LOWD4A w/ E3SLB-OW
Product Description:	E3 IC REMODEL-WD-40DEG-NO LENS
LED Model No.:	Bridgelux® Vesta® Series Dim-To-Warm 15mm Array
Driver Model No.:	PTB15W-0300-38-VCC
Light Source:	LED
CEC Product Type:	Inseparable

Criteria	Results
Light Output (lumens)	754.5
Input Power (W)	12.01
Lumen Efficacy (lm/W)	62.8
Input Power Factor ()	0.986
Correlated Color Temperature (K)	3016
Color Rendering Index - Ra ()	94.4
Color Rendering Index - R9 ()	77.2
Duv ()	-0.0029
Chromaticity Coordinate (x)	0.432
Chromaticity Coordinate (y)	0.395
Chromaticity Coordinate (u')	0.251
Chromaticity Coordinate (v')	0.517

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with IESNA LM-79.

INTEGRATING SPHERE TESTING

A spectroradiometer and integrating sphere were used to measure the spectral distribution for each EUT resulting in photometric and colorimetric data. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position inside the sphere and stabilization procedures to LM-79 were followed.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

A Type C Mirror Goniophotometer system was used to measure the luminous intensity (candela) at each angle of distribution for the EUT. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position near the EUT at equal height and stabilization procedures to LM-79 were followed.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	E3SRF-LOWD4A w/ E3SLB-OW	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

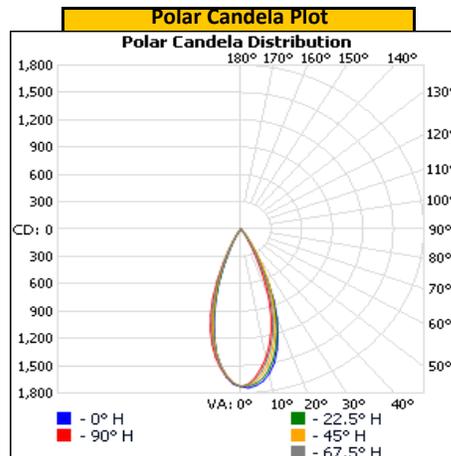
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.09	101.0	11.98	0.988

Light Output (lm)	Lumen Efficacy (lm/W)
738.5	61.6

INTENSITY SUMMARY - CANDELA

Angle	0	22.5	45	67.5	90
0	1728	1728	1728	1728	1728
5	1724	1700	1675	1651	1631
10	1609	1572	1521	1465	1430
15	1370	1336	1275	1211	1153
20	1036	1010	960	883	807
25	607	632	630	504	408
30	281	281	329	208	151
35	100	110	109	66	46
40	39	40	41	21	12
45	9	9	14	4	1
50	0	0	1	0	0
55	0	0	0	0	0
60	0	0	0	0	0
65	0	0	0	0	0
70	0	0	0	0	0
75	0	0	0	0	0
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0
95	0	0	0	0	0
100	0	0	0	0	0
105	0	0	0	0	0
110	0	0	0	0	0
115	0	0	0	0	0
120	0	0	0	0	0
125	0	0	0	0	0
130	0	0	0	0	0
135	0	0	0	0	0
140	0	0	0	0	0
145	0	0	0	0	0
150	0	0	0	0	0
155	0	0	0	0	0
160	0	0	0	0	0
165	0	0	0	0	0
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

Entire luminous intensity matrix found in .IES file



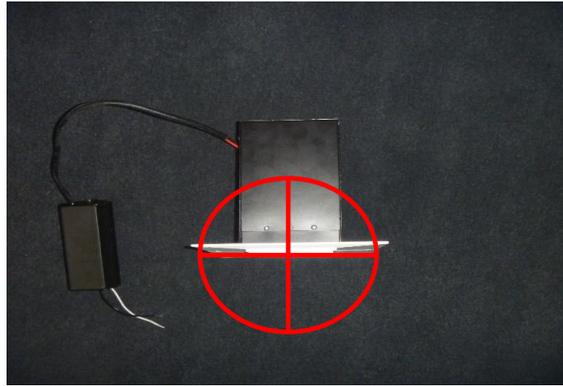
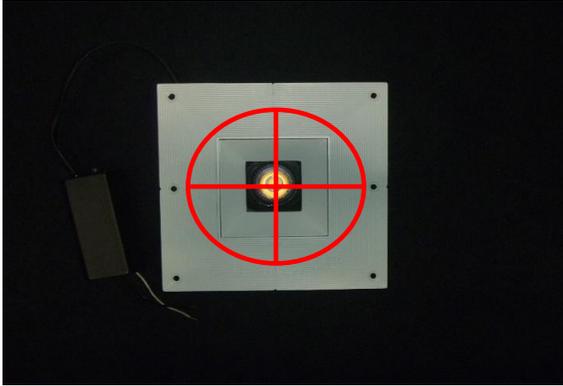
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ORIENTATION AND ALIGNMENT OF EUT

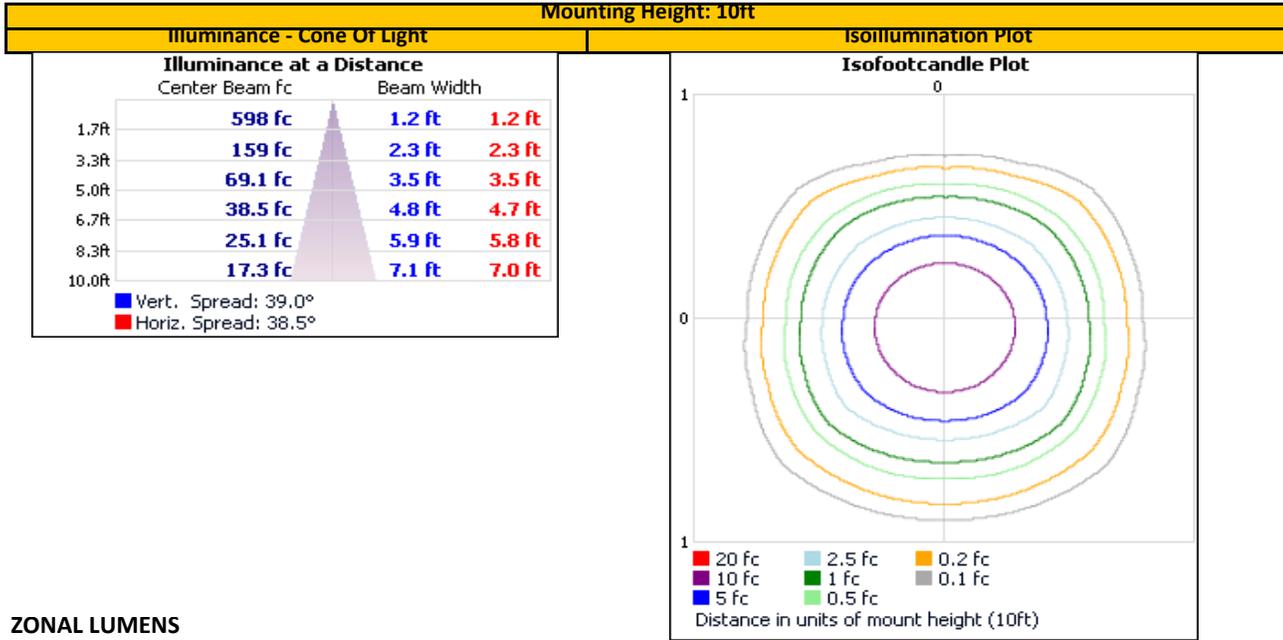
Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
0.29	0.29	0.00
0°-180° H	90°-270° H	0°-180° V

Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	% Lum	Zone	Lumens	% Total
0-30	683.0	92.5%	0-10	150.9	20.4%
0-40	733.2	99.3%	10-20	318.9	43.2%
0-60	738.5	100.0%	20-30	213.2	28.9%
60-90	0.0	0.0%	30-40	50.2	6.8%
70-100	0.0	0.0%	40-50	5.3	0.7%
90-120	0.0	0.0%	50-60	0.0	0.0%
0-90	738.5	100.0%	60-70	0.0	0.0%
90-180	0.0	0.0%	70-80	0.0	0.0%
0-180	738.5	100.0%	80-90	0.0	0.0%
			90-100	0.0	0.0%
			100-110	0.0	0.0%
			110-120	0.0	0.0%
			120-130	0.0	0.0%
			130-140	0.0	0.0%
			140-150	0.0	0.0%
			150-160	0.0	0.0%
			160-170	0.0	0.0%
			170-180	0.0	0.0%

INTEGRATING SPHERE TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	E3SRF-LOWD4A w/ E3SLB-OW	NA

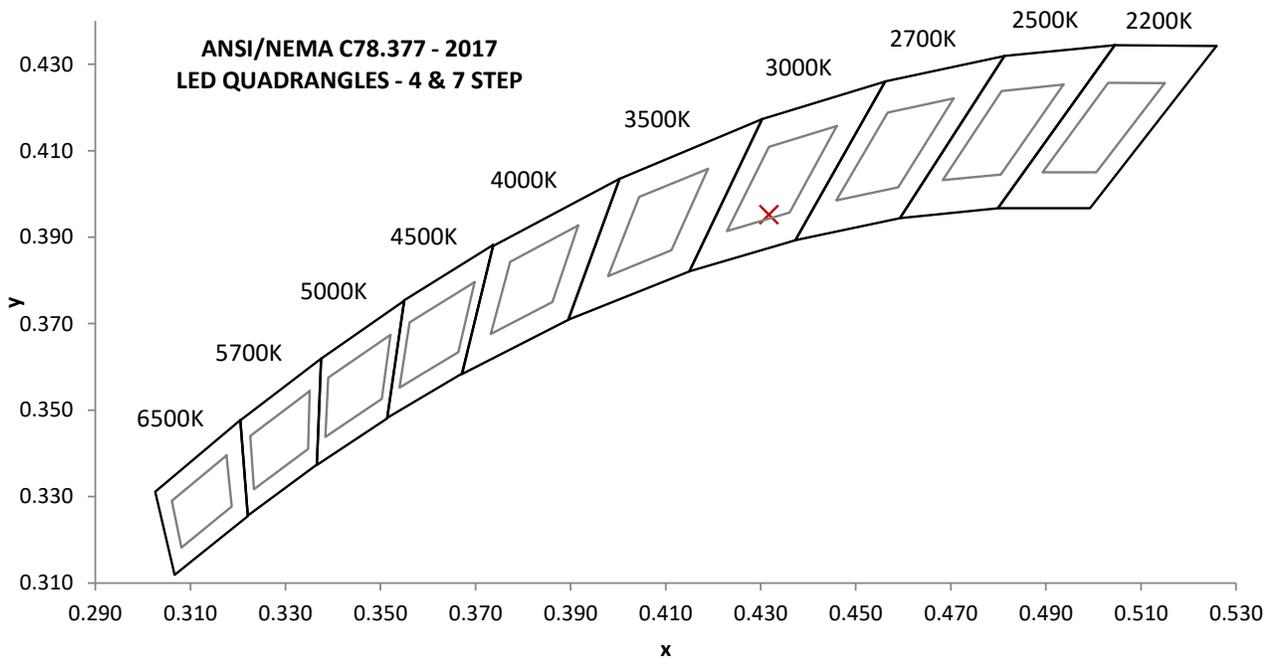
PHOTOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.04	101.5	12.01	0.986	12.31
277.01	48.6	12.25	0.909	18.44

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
754.5	62.8	3016	94.4	77.2

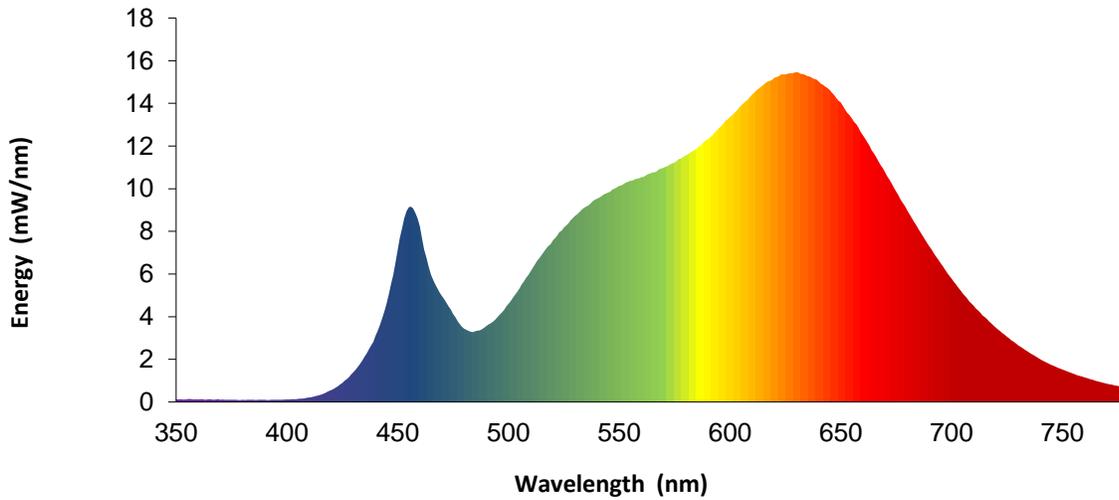
Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0029	0.432	0.395	0.251	0.517



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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.1	460	8.2	570	11.0	680	9.0
355	0.1	465	6.0	575	11.2	685	8.1
360	0.1	470	5.0	580	11.6	690	7.3
365	0.1	475	4.1	585	11.9	695	6.5
370	0.1	480	3.4	590	12.3	700	5.8
375	0.1	485	3.3	595	12.8	705	5.1
380	0.1	490	3.6	600	13.4	710	4.5
385	0.1	495	4.0	605	13.9	715	4.0
390	0.1	500	4.6	610	14.4	720	3.5
395	0.1	505	5.3	615	14.9	725	3.1
400	0.1	510	6.1	620	15.2	730	2.7
405	0.1	515	6.9	625	15.4	735	2.3
410	0.2	520	7.6	630	15.5	740	2.0
415	0.3	525	8.2	635	15.3	745	1.7
420	0.6	530	8.7	640	15.0	750	1.5
425	0.9	535	9.2	645	14.6	755	1.3
430	1.4	540	9.5	650	14.0	760	1.2
435	2.1	545	9.8	655	13.3	765	1.0
440	3.1	550	10.1	660	12.5	770	0.9
445	4.6	555	10.4	665	11.6	775	0.7
450	7.1	560	10.5	670	10.8	780	0.6
455	9.1	565	10.8	675	9.9	---	---



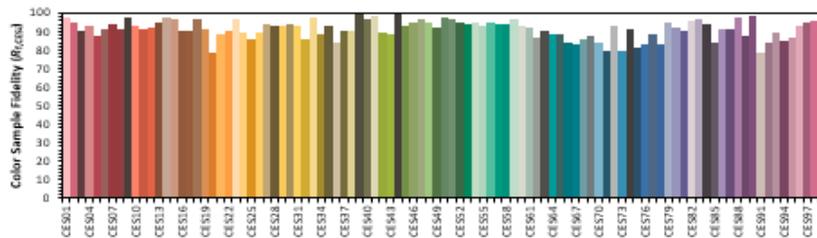
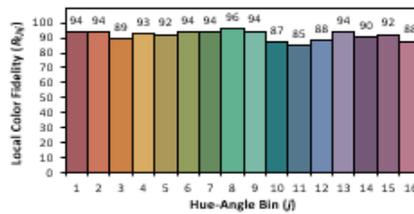
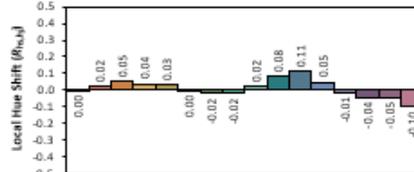
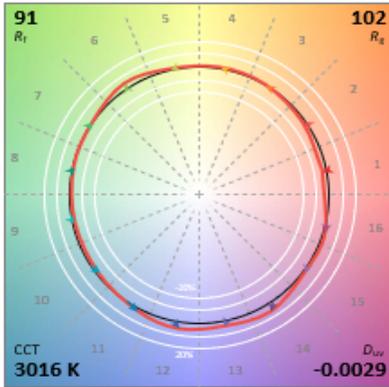
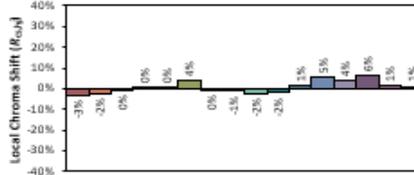
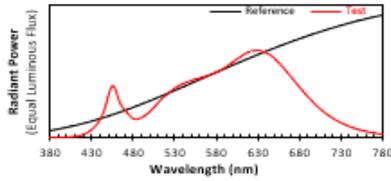
Portrayed color in graphic is estimated by wavelength (nm) and may not be exact - it is a visual representation only

REPORT NO. 104622548CRT-012

ANSI/IES TM-30-18 Color Rendition Report

Source: LED
Date: 9/21/2021

Manufacturer: VISUAL COMFORT AND COMPANY
Model: E3 IC REMODEL-WD-40DEG-NO LENS



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

r **0.4317**
 g **0.3951**
 r' **0.2511**
 v' **0.5170**

CIE 13.3-1995 (CRI)	
R_a	94
R_g	77

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

EQUIPMENT LIST

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#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	Digital Hygrothermometer	Traceable4800	L204	2/12/2021	2/12/2022
2	Tektronix Oscilloscope	DPO 2012	E480	2/13/2021	2/13/2022
3	UDT flexOptometer	S490	O224	VBU	VBU
4	Fluke Multimeter	87V	307-M226	3/29/2021	3/29/2022
5	2M Integrating Sphere Spectrometer System	CSLMS-LED-7660	2M2	VBU	VBU
6	Tektronix Oscilloscope	DPO 2012	E480	2/13/2021	2/13/2022
7	Yokogawa Power Analyzer	WT1600	E462	5/7/2021	5/7/2022
8	Digital Thermometer	Fluke 53II	307-N1324	3/26/2021	3/26/2022
9	UDT Signal Amplifier	Tramp	---	VBU	VBU
10	Elgar AC power supply	CW1251	---	VBU	VBU
11	UDT flexOptometer	S490	O217	VBU	VBU
12	Digital Stopwatch	181552980	307-M308	12/10/2020	12/10/2021
13	Elgar AC Power Supply	CW1251	---	VBU	VBU
14	Sorenson DC Power Supply	XFR 150-8	---	VBU	VBU
15	Traceable Hygrothermometer	4800	L206	2/12/2021	2/12/2022
16	Yokogawa Power Analyzer	WT1600	E474	6/15/2021	6/15/2022
17	Fluke Thermometer	53 II	D587	2/5/2021	2/5/2022
18	3M Integrating Sphere Spectrometer System	CDS 2600	---	9/3/2021	12/3/2021
19	Fisher Scientific Stopwatch	14-649-9	N1132	3/26/2021	3/26/2022

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
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