



8165 E Kaiser Blvd. Anaheim, CA 92808
 p. 714.282.2270
 f. 714.676.5558

Test #: L07134907

Date: 8/5/2013



NVLAP LAB CODE 200927-0

Test Report: L07134907

Model Number: 4924-26-XX

Report Prepared For: AION LED
 2325 3RD ST #330 SAN FRANCISCO, CA 94107

Test: Electrical and Photometric tests as required by the IESNA test standards.

Standards Used: Appropriate part or all test guidelines were used for test performed:
IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products

Description of Sample: Client submitted the sample. Fixture catalog number is 4924-26-XX .
 Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 7/16/13

Date of Tests: 8/2/13 - 8/5/13

Seasoning of Sample SSL: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S1	01/04/14
Xitron Power Analysis System	2503AH	MT-EL01	01/09/14
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/14
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

LM-79 Test Summary

Manufacturer:	AION LED
Model Number:	4924-26-XX
LAMPCAT:	N/A
Driver Model Number:	N/A
Total Lumens:	190.98
Input Voltage (VDC):	24.00
Input Current (Amp):	0.12
Input Power (W):	2.83
Input Power Factor:	N/A
Total Harmonic Distortion @ 120V(%):	N/A
Total Harmonic Distortion @ 277V(%):	N/A
Efficacy:	68
Color Rendering Index (CRI):	97
Correlated Color Temperature (K):	2514
Chromaticity Coordinate x:	0.4728
Chromaticity Coordinate y:	0.4086
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	1:10
Off State Power(W):	0.00

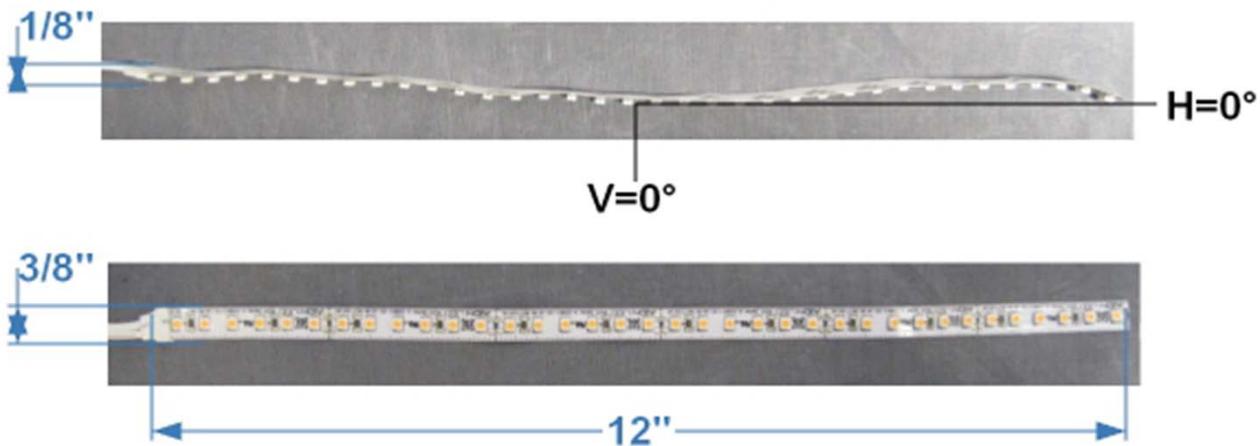
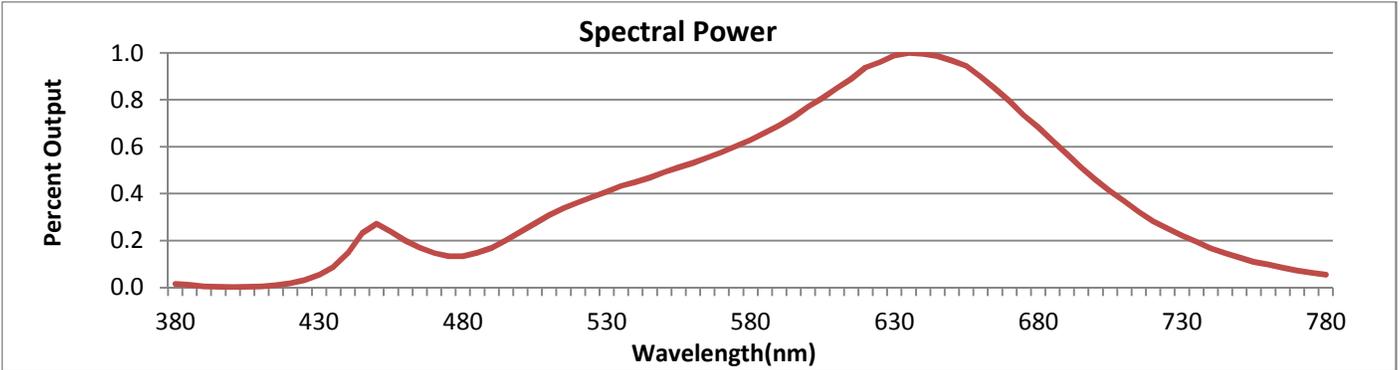


FIG1. LUMINAIRE

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.



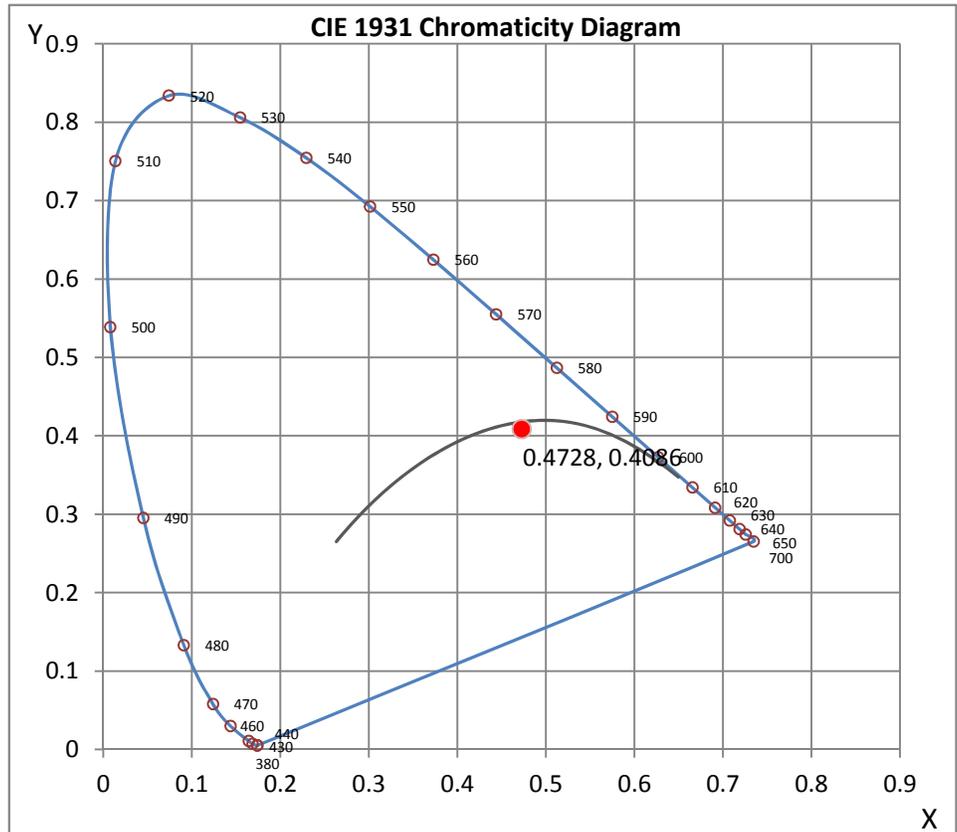
Wavelength	W/m ² nm	440	0.0028	510	0.0058	580	0.0118	650	0.0182	720	0.0053
380	0.0003	450	0.0051	520	0.0068	590	0.0130	660	0.0169	730	0.0042
390	0.0001	460	0.0038	530	0.0077	600	0.0145	670	0.0149	740	0.0032
400	0.0000	470	0.0028	540	0.0084	610	0.0159	680	0.0129	750	0.0024
410	0.0001	480	0.0025	550	0.0092	620	0.0176	690	0.0107	760	0.0018
420	0.0003	490	0.0032	560	0.0100	630	0.0186	700	0.0086	770	0.0014
430	0.0010	500	0.0045	570	0.0108	640	0.0187	710	0.0069	780	0.0010

CRI & CCT

x	0.4728
y	0.4086
u'	0.2718
v'	0.5285
CRI	96.50
CCT	2514
Duv	-0.00157

R Values

R1	98.09
R2	98.10
R3	95.89
R4	96.78
R5	97.60
R6	97.63
R7	95.76
R8	92.45
R9	83.61
R10	94.21
R11	96.40
R12	90.72
R13	98.37
R14	96.53



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Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Report Prepared by : Keyur Patel

Test Report Released by:

Jeff Ahn
 Engineering Manager

Test Report Reviewed by:

Steve Kang
 Quality Assurance

**Attached are photometric data reports. Total number of pages: 9*

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.



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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L07134907.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST] L07134907
 [TESTLAB] LIGHT LABORATORY, INC.
 [ISSUEDATE] 8/5/2013
 [MANUFAC] AION LED
 [LUMCAT] 4924-26-XX
 [LUMINAIRE] 12"L. X 3/8"W. X 1/8"H. LED FLEX CIRCUIT LIGHT ENGINE ONLY
 [LAMPPOSITION] 0,0
 [LAMPCAT] N/A
 [OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
 [MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
 [POWER SUPPLY] 24VDC CONSTANT VOLTAGE SOURCE
 [INPUT] 24VDC, 2.83W
 [TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	191
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	67
Total Luminaire Watts	2.83
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.26
Spacing Criterion (90-270)	1.30
Spacing Criterion (Diagonal)	1.42
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.94 ft
Luminous Width (90-270)	0.01 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	70556	71867	72514
55	69111	70427	71026
65	66051	67648	68162
75	56932	58877	59319
85	42791	46992	49355

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L07134907.IES

CANDELA TABULATION

	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>	<u>30</u>	<u>35</u>	<u>40</u>	<u>45</u>
0	64.00	64.00	64.00	64.00	64.00	64.00	64.00	64.00	64.00	64.00
5	62.67	62.80	63.04	63.27	63.26	63.37	63.70	64.02	64.10	63.91
10	61.93	62.08	62.34	62.55	62.54	62.70	62.99	63.28	63.38	63.19
15	60.73	60.84	61.11	61.32	61.31	61.51	61.72	62.06	62.13	61.92
20	59.05	59.16	59.38	59.64	59.60	59.81	59.99	60.33	60.32	60.20
25	56.82	56.93	57.18	57.40	57.38	57.57	57.75	58.05	58.00	57.97
30	54.20	54.30	54.52	54.75	54.76	54.92	55.13	55.34	55.28	55.25
35	51.06	51.12	51.32	51.55	51.54	51.70	51.90	52.00	52.02	52.03
40	47.59	47.67	47.85	48.02	48.04	48.23	48.37	48.46	48.52	48.49
45	43.61	43.64	43.81	43.97	43.99	44.14	44.28	44.37	44.36	44.42
50	39.30	39.36	39.50	39.61	39.71	39.82	39.91	39.97	40.03	40.10
55	34.65	34.65	34.78	34.89	34.97	35.07	35.13	35.19	35.25	35.31
60	29.67	29.63	29.74	29.86	29.96	30.01	30.07	30.15	30.21	30.27
65	24.40	24.38	24.49	24.55	24.66	24.71	24.76	24.84	24.88	24.99
70	18.31	18.31	18.38	18.45	18.52	18.56	18.63	18.70	18.77	18.83
75	12.88	12.89	12.94	12.99	13.04	13.10	13.17	13.22	13.27	13.32
80	7.56	7.55	7.59	7.63	7.68	7.72	7.77	7.81	7.85	7.90
85	3.26	3.27	3.28	3.32	3.38	3.43	3.46	3.50	3.54	3.58
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Vert. Angles **Horizontal Angles**

	<u>50</u>	<u>55</u>	<u>60</u>	<u>65</u>	<u>70</u>	<u>75</u>	<u>80</u>	<u>85</u>	<u>90</u>
0	64.00	64.00	64.00	64.00	64.00	64.00	64.00	64.00	64.00
5	63.89	63.92	63.97	64.06	64.22	64.35	64.37	64.38	64.41
10	63.16	63.18	63.24	63.36	63.50	63.61	63.64	63.65	63.67
15	61.93	61.96	62.02	62.11	62.25	62.36	62.40	62.41	62.42
20	60.19	60.21	60.29	60.38	60.54	60.64	60.64	60.66	60.65
25	57.93	57.94	58.06	58.15	58.25	58.36	58.37	58.40	58.37
30	55.27	55.28	55.39	55.51	55.60	55.68	55.70	55.71	55.72
35	52.07	52.08	52.16	52.28	52.37	52.43	52.42	52.46	52.43
40	48.53	48.56	48.66	48.77	48.85	48.89	48.88	48.90	48.89
45	44.46	44.50	44.62	44.72	44.77	44.77	44.79	44.79	44.82
50	40.12	40.20	40.30	40.37	40.39	40.40	40.42	40.42	40.42
55	35.39	35.46	35.52	35.58	35.60	35.59	35.62	35.62	35.61
60	30.34	30.43	30.45	30.49	30.52	30.52	30.52	30.51	30.49
65	25.04	25.10	25.11	25.16	25.16	25.14	25.17	25.16	25.18
70	18.88	18.93	18.93	18.95	18.95	18.94	18.95	18.96	18.95
75	13.37	13.38	13.39	13.41	13.42	13.42	13.42	13.42	13.42
80	7.92	7.94	7.97	7.99	8.00	8.01	8.00	8.00	8.00
85	3.62	3.65	3.67	3.70	3.72	3.74	3.75	3.75	3.76
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L07134907.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	23.52	N.A.	12.30
0-30	50.20	N.A.	26.30
0-40	82.73	N.A.	43.30
0-60	148.47	N.A.	77.70
0-80	186.91	N.A.	97.90
0-90	190.98	N.A.	100.00
10-90	184.91	N.A.	96.80
20-40	59.20	N.A.	31.00
20-50	93.44	N.A.	48.90
40-70	90.19	N.A.	47.20
60-80	38.44	N.A.	20.10
70-80	14.00	N.A.	7.30
80-90	4.07	N.A.	2.10
90-110	0.00	N.A.	0.00
90-120	0.00	N.A.	0.00
90-130	0.00	N.A.	0.00
90-150	0.00	N.A.	0.00
90-180	0.00	N.A.	0.00
110-180	0.00	N.A.	0.00
0-180	190.98	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

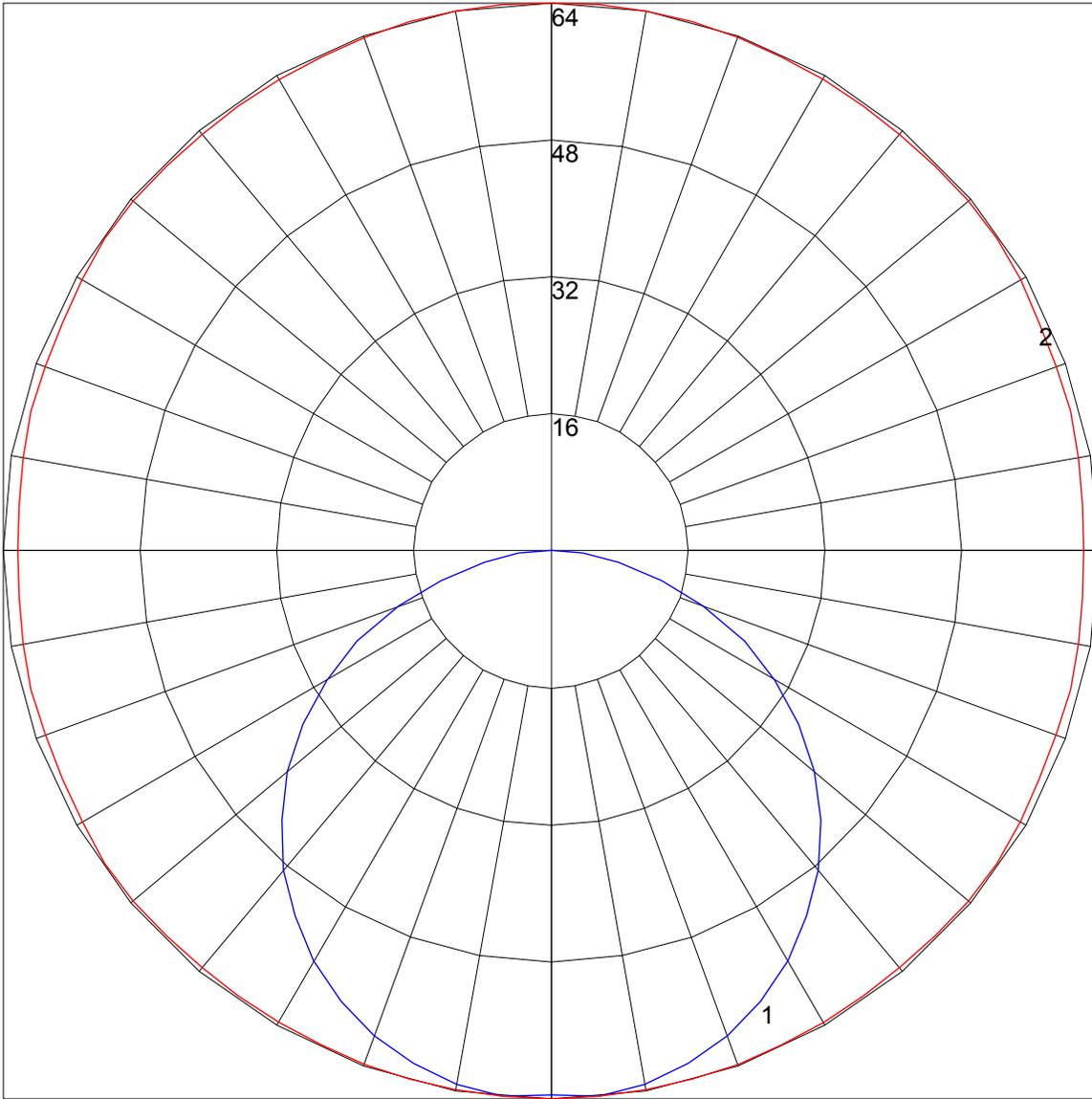
Zone	Lumens
0-10	6.07
10-20	17.46
20-30	26.68
30-40	32.53
40-50	34.24
50-60	31.50
60-70	24.44
70-80	14.00
80-90	4.07
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	108	104	99	95	106	101	97	94	97	94	91	93	90	88	89	87	85	83
2	98	90	83	77	96	88	82	76	84	79	74	81	77	73	78	74	71	69
3	90	79	70	64	87	77	69	63	74	68	62	71	66	61	69	64	60	58
4	82	70	61	54	80	68	60	53	66	58	53	63	57	52	61	56	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	47	40	67	55	46	40	53	45	40	51	44	39	50	44	39	37
7	64	51	42	35	62	50	41	35	48	41	35	47	40	35	45	39	34	32
8	60	46	37	31	58	45	37	31	44	37	31	43	36	31	42	35	31	29
9	56	42	34	28	54	42	34	28	40	33	28	39	33	28	38	32	28	26
10	52	39	31	26	51	38	31	26	37	30	25	36	30	25	36	30	25	23

POLAR GRAPH



Maximum Candela = 64.41 Located At Horizontal Angle = 90, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (90 - 270) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)