



8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

Report No: L091700102



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Issue Date: 9/21/2017

Report Prepared For: Vode Lighting
21684 8th Street East, Suite 700, Sonoma, CA 95476

Model Number: 707-Z2-48-Z-SO-358-S3-AL

Test: Electrical and Photometric tests

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
ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 9/15/17

Date of Tests: 9/15/17 - 9/21/17

Seasoning of Sample: 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	11/28/17
ITECH	IT6122	PS-DC03-S1	11/28/17
Fluke Digital Thermometer	52k/J	MT-TP02-GC	11/28/17
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.

Test Summary

Manufacturer:	Vode Lighting
Model Number:	707-Z2-48-Z-SO-358-S3-AL
Driver Model Number:	MEAN WELL HLG-40H-36A
Total Lumens:	3168.29
Input Voltage (VAC/60Hz):	120.00
Input Current (Amp):	0.22
Input Power (W):	26.32
Input Power Factor:	0.99
Current ATHD @ 120V(%):	10%
Current ATHD @ 277V(%):	N/A
Efficacy:	120
Color Rendering Index (CRI):	85
Correlated Color Temperature (K):	3350
Chromaticity Coordinate x:	0.4131
Chromaticity Coordinate y:	0.3926
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:40
Total Operating Time (Hours):	1:30

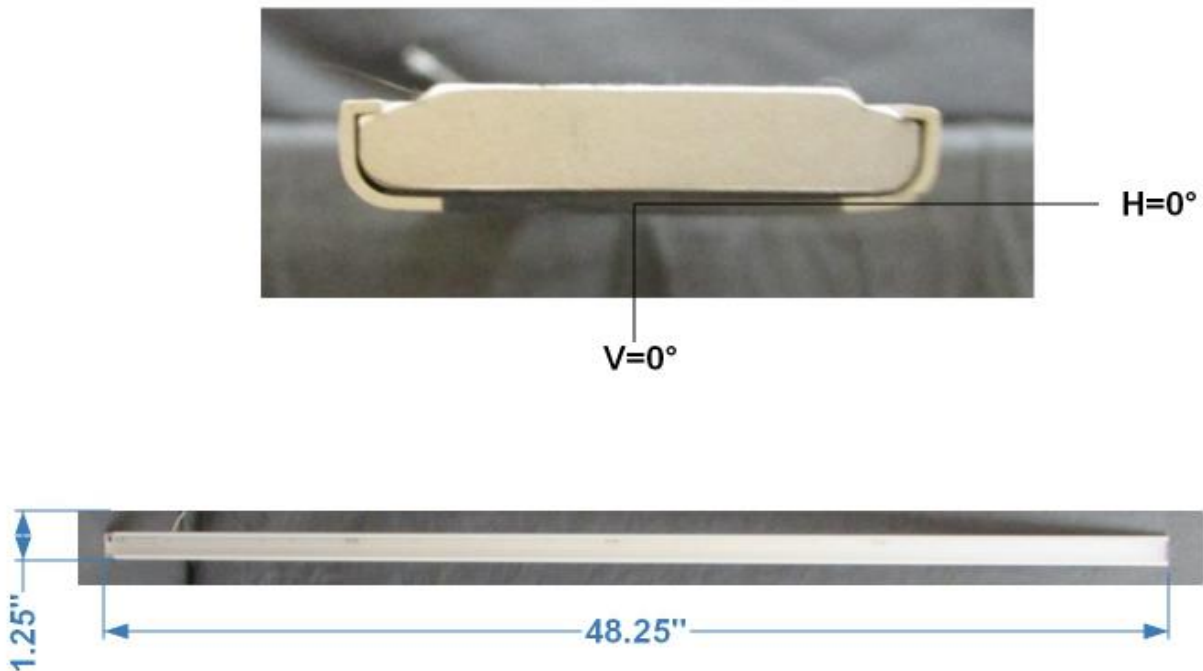
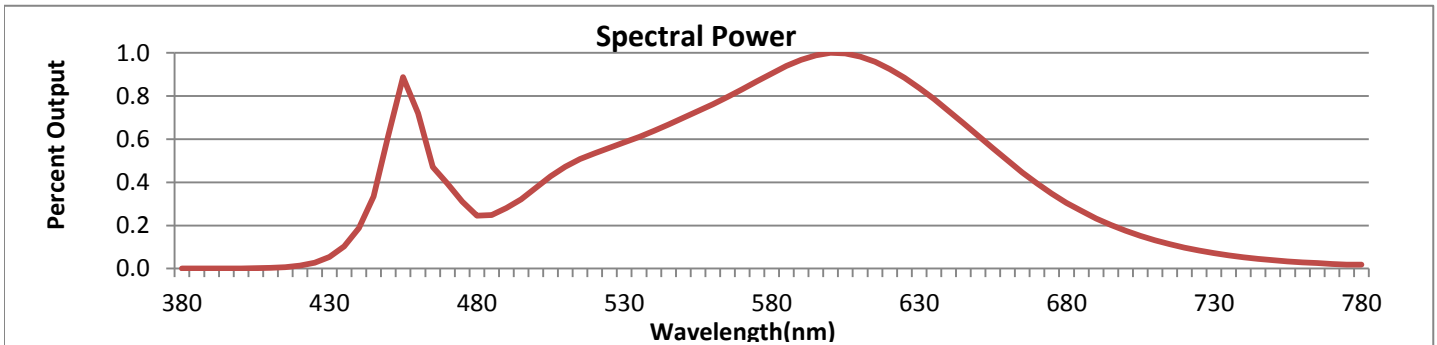


FIG. 1 LUMINAIRE

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



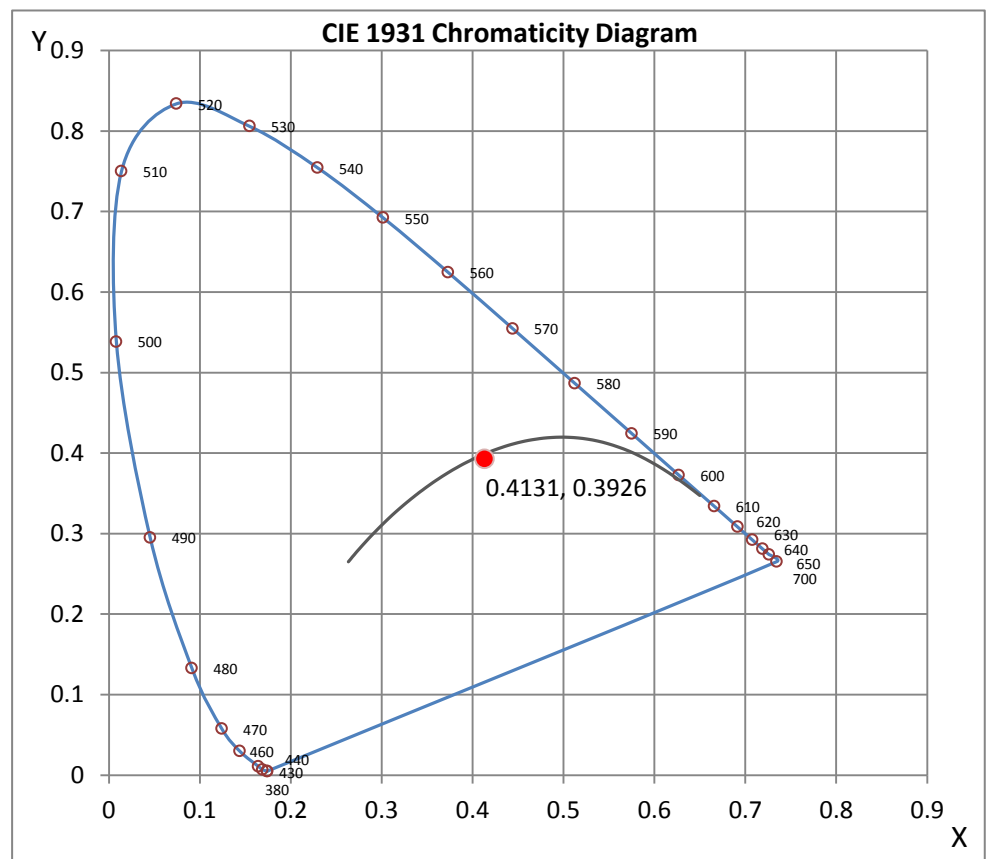
Wavelength	W/m ² nm	440	0.1879	510	0.4722	580	0.9048	650	0.6161	720	0.0969
380	0.0009	450	0.6181	520	0.5350	590	0.9684	660	0.5019	730	0.0715
390	0.0009	460	0.7203	530	0.5854	600	1.0000	670	0.3947	740	0.0528
400	0.0012	470	0.3942	540	0.6388	610	0.9833	680	0.3049	750	0.0392
410	0.0031	480	0.2459	550	0.6996	620	0.9248	690	0.2322	760	0.0290
420	0.0132	490	0.2805	560	0.7621	630	0.8371	700	0.1750	770	0.0216
430	0.0537	500	0.3741	570	0.8315	640	0.7311	710	0.1309	780	0.0188

CRI & CCT

x	0.4131
y	0.3926
u'	0.2400
v'	0.5132
CRI	84.80
CCT	3350
Duv	-0.00081

R Values

R1	83.95
R2	92.72
R3	96.46
R4	82.01
R5	83.33
R6	89.56
R7	85.06
R8	65.47
R9	20.33
R10	82.04
R11	80.89
R12	65.78
R13	86.34
R14	98.62



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

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.

Disclaimers:

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government.

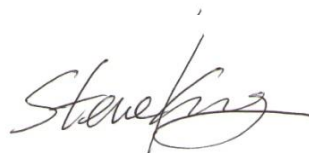
Report Prepared by : Keyur Patel

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*



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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L091700102.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L091700102
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 9/21/2017
[MANUFAC] Vode Lighting
[LUMCAT] 707-Z2-48-Z-SO-358-S3-AL
[LUMINAIRE] ZipTwo LED, 48", 3500K, 80 CRI, zipper board,
[MORE] 120° white symmetric lens, standard output
[BALLASTCAT] MEAN WELL HLG-40H-36A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 120VAC, 26.32W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	3168
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	120
Total Luminaire Watts	26.32
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.54
Spacing Criterion (90-270)	1.14
Spacing Criterion (Diagonal)	1.50
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.06 ft
Luminous Width (90-270)	4.02 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	59521	53153	36886
55	52468	47960	34824
65	41038	37662	31965
75	29457	26528	23944
85	18416	15347	12789

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L091700102.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	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075
5	1083	1083	1082	1082	1081	1080	1079	1078	1076	1075
10	1103	1103	1102	1100	1097	1093	1089	1085	1079	1074
15	1127	1126	1124	1120	1115	1108	1100	1091	1081	1070
20	1144	1143	1139	1134	1127	1117	1106	1093	1078	1062
25	1150	1149	1145	1139	1129	1118	1104	1086	1067	1045
30	1139	1137	1133	1126	1116	1103	1087	1068	1045	1019
35	1104	1103	1099	1092	1083	1070	1053	1032	1008	979
40	1040	1039	1036	1030	1022	1011	996	976	951	922
45	944	944	942	938	932	923	911	893	871	843
50	819	819	818	816	813	807	797	784	764	740
55	675	675	675	674	672	669	663	652	637	617
60	527	527	527	527	526	524	519	512	500	485
65	389	389	389	389	388	386	383	377	368	357
70	269	269	269	269	268	267	264	259	253	246
75	171	171	171	171	170	169	167	164	159	154
80	95	95	95	95	94	93	91	89	87	84
85	36	36	36	36	35	35	34	33	32	30
90	0	0	0	0	0	0	0	0	0	0

Vert. 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	1075	1075	1075	1075	1075	1075	1075	1075	1075
5	1074	1072	1071	1070	1069	1068	1067	1067	1067
10	1069	1063	1058	1054	1049	1046	1044	1042	1041
15	1059	1048	1037	1027	1018	1010	1005	1001	1000
20	1044	1026	1009	991	976	963	953	947	945
25	1022	997	972	948	926	906	892	883	880
30	990	958	927	896	867	843	824	813	809
35	946	910	873	836	803	773	752	738	734
40	887	848	808	767	732	700	678	664	659
45	809	771	730	690	655	626	604	590	585
50	709	675	639	604	574	549	531	519	515
55	592	564	536	510	489	471	458	450	448
60	466	446	428	412	400	390	383	380	378
65	345	333	323	315	309	306	304	303	303
70	238	231	226	222	221	220	220	220	220
75	150	146	143	141	140	139	139	139	139
80	81	79	77	76	75	74	73	72	72
85	29	28	27	27	26	26	25	25	25
90	0	0	0	0	0	0	0	0	0

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L091700102.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	404.20	N.A.	12.80
0-30	879.08	N.A.	27.70
0-40	1471.11	N.A.	46.40
0-60	2610.86	N.A.	82.40
0-80	3128.76	N.A.	98.80
0-90	3168.29	N.A.	100.00
10-90	3065.74	N.A.	96.80
20-40	1066.91	N.A.	33.70
20-50	1682.93	N.A.	53.10
40-70	1489.23	N.A.	47.00
60-80	517.89	N.A.	16.30
70-80	168.42	N.A.	5.30
80-90	39.53	N.A.	1.20
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	3168.29	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	102.55
10-20	301.65
20-30	474.88
30-40	592.04
40-50	616.02
50-60	523.74
60-70	349.48
70-80	168.42
80-90	39.53
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

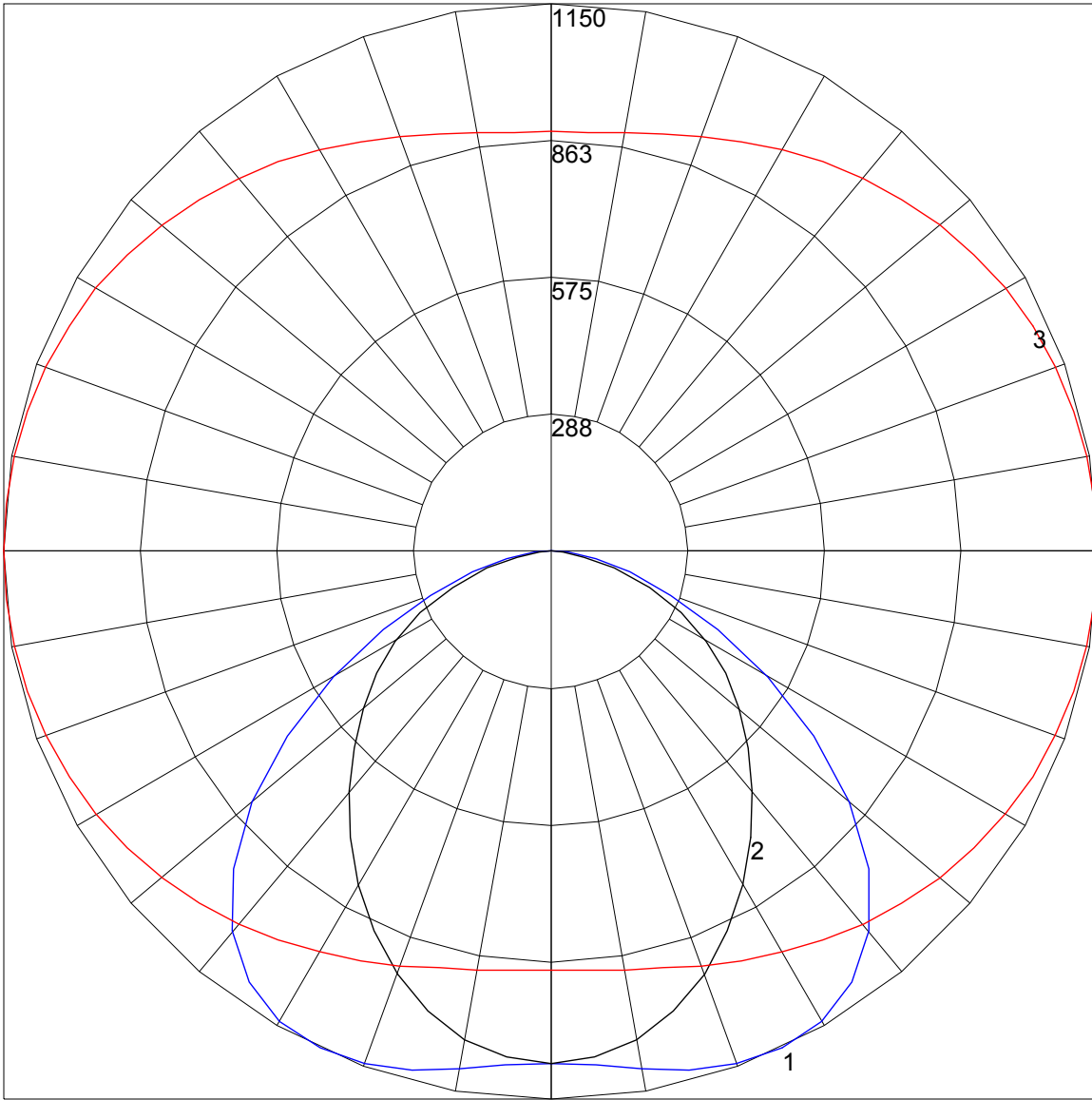
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PHOTOMETRIC FILENAME : L091700102.IES

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	109	105	101	97	107	103	99	95	98	95	92	94	92	90	91	89	87	85
2	100	92	85	80	97	90	84	79	86	81	77	83	79	75	80	77	73	71
3	91	81	73	66	89	79	72	66	76	70	65	73	68	64	71	66	62	60
4	83	72	63	56	81	70	62	56	68	61	55	65	59	54	63	58	54	52
5	77	64	55	49	75	63	55	48	61	53	48	59	52	47	57	51	47	45
6	71	58	49	42	69	57	48	42	55	47	42	53	46	41	52	46	41	39
7	66	52	43	37	64	51	43	37	50	42	37	48	42	37	47	41	36	34
8	61	48	39	33	59	47	39	33	46	38	33	44	38	33	43	37	33	31
9	57	44	35	30	56	43	35	30	42	35	30	41	34	29	40	34	29	27
10	53	40	32	27	52	40	32	27	39	32	27	38	31	27	37	31	27	25

POLAR GRAPH



Maximum Candela = 1150 Located At Horizontal Angle = 0, Vertical Angle = 25
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Vertical Plane Through Horizontal Angles (90 - 270)
3 - Horizontal Cone Through Vertical Angle (25) (Through Max. Cd.)