

customer:

date: 25.08.2021

Harman Professional Denmark ApS.
Olof Plames Allé 14

8200 Aarhus N
Denmark

project No: 21000131-5

inspection order: Photometric measurement according DIN EN 13032-1,
EN 13032-4:2015 and IES LM-79-08

- measurement of intensity distribution
- measurement of luminous flux

measurement procedure: - measurement with goniophotometer according DIN EN 13032

test sample specification:

luminaire: LED fixture for stage and studio, direct beam

description: MAC Ultra Wash - narrow

Serial No.: 15064036359

power supply: Electronics, integrated

DMX settings: zoom: 65635
focus: 32768
Fans: Constant Fan Full

test sample dimensions:

luminaire dimensions:

length:	300 mm
width:	450 mm
height:	855 mm
diameter:	- mm

dimensions of luminant areas:

length:	- mm
width:	- mm
height:	- mm
diameter:	220 mm

measurement configuration:

	area	step size
C- planes	0 - 360°	1°
γ- angle	0 - 5°	0.2°
	5 - 10°	1°
	10 - 90°	5°

luminaire position: hanging, light beam vertical

light center: central, bottom of light output

test results:

stabilization time: 30 min.

stability of luminous flux: < 1%

luminous flux:

upper half space	lower half space	overall
-	61202,96 lm	61202,96 lm
-	100 %	100 %

max. luminous intensity: 5352349,0 cd @ ($\gamma=0^\circ/C=0^\circ$)
 beam angles:
 half beam 50 % : 6,8°
 field angle 10% : 9,1°
 cutoff angel 3% : 10,0°

symmetry condition: rotational symmetric

luminous efficiency: 45,89 lm/W

electrical operating conditions:
 voltage: 230,0 V (const. < 0.1%)
 current: 5,838 A
 system power: 1333,60 W
 power factor: 0,993
ambient temperature:

T = 25° C ± 1° C

The company ILUmetriX insures that all statements are made by the best of knowledge, according to European standards.

Meschede, 25.08.2021



F. Siepe (Management Board)


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 page 10 testsample
 page 11 testequipment

PHOTOMETRIC RESULTS

Manufacturer:	Harman Professional ApS	Voltage:	230,07 V
Name:	MAC Ultra Wash - narrow	Current:	5,840 A
Report:	21000131-5	Power:	1333,6 W
Date:	24.08.2021 09:33:33		
Operator:	F. Siepe	No. of lamps:	1
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Cones (C0-359-1, G0-90-1/25, S7)

LiTG-class:	A60		
UTE-class:	Not available		
IES-class:	100 - 100 - 100 - 100 - 100		
TM5-class:	Not available		
Divergences in the plane through maximum intensity:			
	Horizontal	Vertical	
One half peak divergence:	6,8°	6,8°	
Half peak side angle (left):	-3,4°	-3,4°	
Half peak side angle (right):	3,4°	3,4°	
One tenth peak divergence:	9,1°	9,1°	
Tenth peak side angle (left):	-4,5°	-4,5°	
Tenth peak side angle (right):	4,5°	4,5°	

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Intensity [cd] MAC Ultra Wash - narrow

G/C [cd]	0,0
0,0	5352349,0
0,2	5342658,0
0,4	5315544,0
0,6	5297525,0
0,8	5249522,0
1,0	5194901,0
1,2	5121561,0
1,4	4987303,0
1,6	4923325,0
1,8	4730785,0
2,0	4644341,0
2,2	4395185,0
2,4	4278256,0
2,6	4038252,0
2,8	3804248,0
3,0	3472899,0
3,2	3156784,0
3,4	2725491,0
3,6	2101804,0
3,8	1869794,0
4,0	1244861,0
4,2	1040185,0
4,4	678206,9
4,6	454785,4
4,8	273919,6
5,0	175397,4
6,0	17463,6
7,0	3315,7
8,0	1167,3
9,0	643,9
10,0	388,0
15,0	64,8
20,0	43,0
25,0	32,4
30,0	26,5
35,0	23,2
40,0	20,4
45,0	17,0
50,0	13,4
55,0	10,0
60,0	8,4
65,0	7,9
70,0	2,8
75,0	1,5
80,0	0,7
85,0	0,2
90,0	0,1

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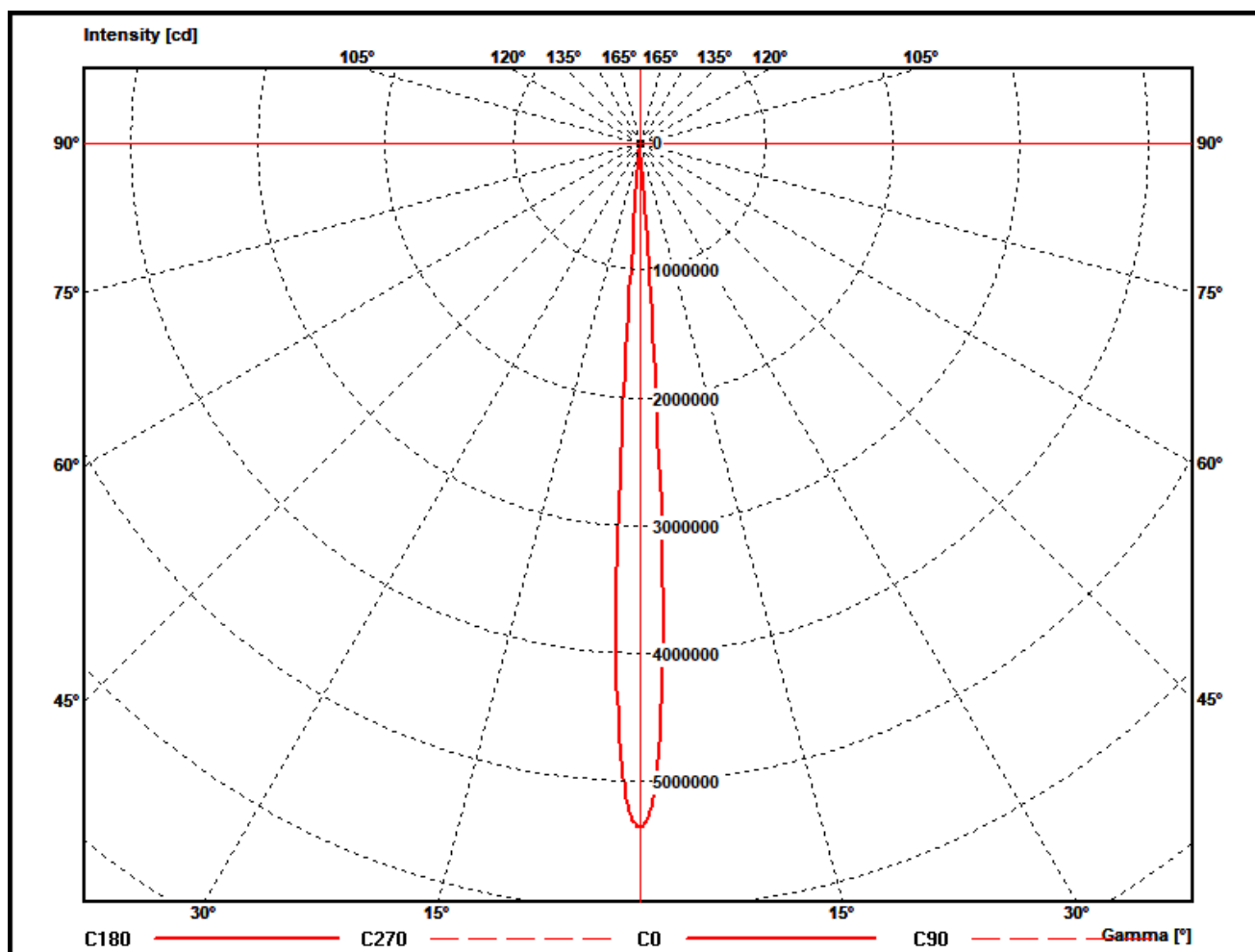
Zonal flux MAC Ultra Wash - narrow

Gamma [°]	Imin [cd/klm]	Imax [cd/klm]	Imean [cd/klm]	Zonal flux [lm]	Sum. zonal flux [lm]	Rel. zonal flux [%]	Sum. rel. zonal flux [%]
0,0	87452,5	87452,5	87452,5	0,00	0,00	0,00	0,00
0,2	87294,1	87294,1	87294,1	204,70	204,70	0,33	0,33
0,4	86851,1	86851,1	86851,1	611,98	816,68	1,00	1,33
0,6	86556,7	86556,7	86556,7	1015,64	1832,32	1,66	2,99
0,8	85772,4	85772,4	85772,4	1413,03	3245,35	2,31	5,30
1,0	84879,9	84879,9	84879,9	1799,05	5044,40	2,94	8,24
1,2	83681,6	83681,6	83681,6	2171,86	7216,26	3,55	11,79
1,4	81487,9	81487,9	81487,9	2515,03	9731,29	4,11	15,90
1,6	80442,6	80442,6	80442,6	2844,97	12576,26	4,65	20,55
1,8	77296,7	77296,7	77296,7	3140,74	15716,99	5,13	25,68
2,0	75884,2	75884,2	75884,2	3408,68	19125,67	5,57	31,25
2,2	71813,3	71813,3	71813,3	3632,47	22758,14	5,94	37,18
2,4	69902,8	69902,8	69902,8	3817,13	26575,27	6,24	43,42
2,6	65981,3	65981,3	65981,3	3978,11	30553,38	6,50	49,92
2,8	62157,9	62157,9	62157,9	4051,28	34604,66	6,62	56,54
3,0	56744,0	56744,0	56744,0	4037,46	38642,12	6,60	63,14
3,2	51578,9	51578,9	51578,9	3931,67	42573,79	6,42	69,56
3,4	44532,0	44532,0	44532,0	3713,25	46287,04	6,07	75,63
3,6	34341,5	34341,5	34341,5	3231,74	49518,77	5,28	80,91
3,8	30550,7	30550,7	30550,7	2810,60	52329,37	4,59	85,50
4,0	20339,9	20339,9	20339,9	2323,13	54652,50	3,80	89,30
4,2	16995,7	16995,7	16995,7	1791,60	56444,11	2,93	92,22
4,4	11081,3	11081,3	11081,3	1412,92	57857,03	2,31	94,53
4,6	7430,8	7430,8	7430,8	974,83	58831,85	1,59	96,13
4,8	4475,6	4475,6	4475,6	654,78	59486,64	1,07	97,20
5,0	2865,8	2865,8	2865,8	420,88	59907,51	0,69	97,88
6,0	285,3	285,3	285,3	1013,54	60921,05	1,66	99,54
7,0	54,2	54,2	54,2	128,98	61050,02	0,21	99,75
8,0	19,1	19,1	19,1	32,08	61082,11	0,05	99,80
9,0	10,5	10,5	10,5	14,68	61096,79	0,02	99,83
10,0	6,3	6,3	6,3	9,34	61106,12	0,02	99,84
15,0	1,1	1,1	1,1	26,86	61132,98	0,04	99,89
20,0	0,7	0,7	0,7	8,89	61141,87	0,01	99,90
25,0	0,5	0,5	0,5	7,91	61149,79	0,01	99,91
30,0	0,4	0,4	0,4	7,46	61157,24	0,01	99,93
35,0	0,4	0,4	0,4	7,32	61164,56	0,01	99,94
40,0	0,3	0,3	0,3	7,28	61171,84	0,01	99,95
45,0	0,3	0,3	0,3	6,93	61178,77	0,01	99,96
50,0	0,2	0,2	0,2	6,14	61184,91	0,01	99,97
55,0	0,2	0,2	0,2	5,08	61189,99	0,01	99,98
60,0	0,1	0,1	0,1	4,25	61194,23	0,01	99,99
65,0	0,1	0,1	0,1	3,97	61198,21	0,01	99,99
70,0	0,0	0,0	0,0	2,72	61200,93	0,00	100,00
75,0	0,0	0,0	0,0	1,12	61202,04	0,00	100,00
80,0	0,0	0,0	0,0	0,58	61202,63	0,00	100,00
85,0	0,0	0,0	0,0	0,25	61202,88	0,00	100,00
90,0	0,0	0,0	0,0	0,09	61202,96	0,00	100,00

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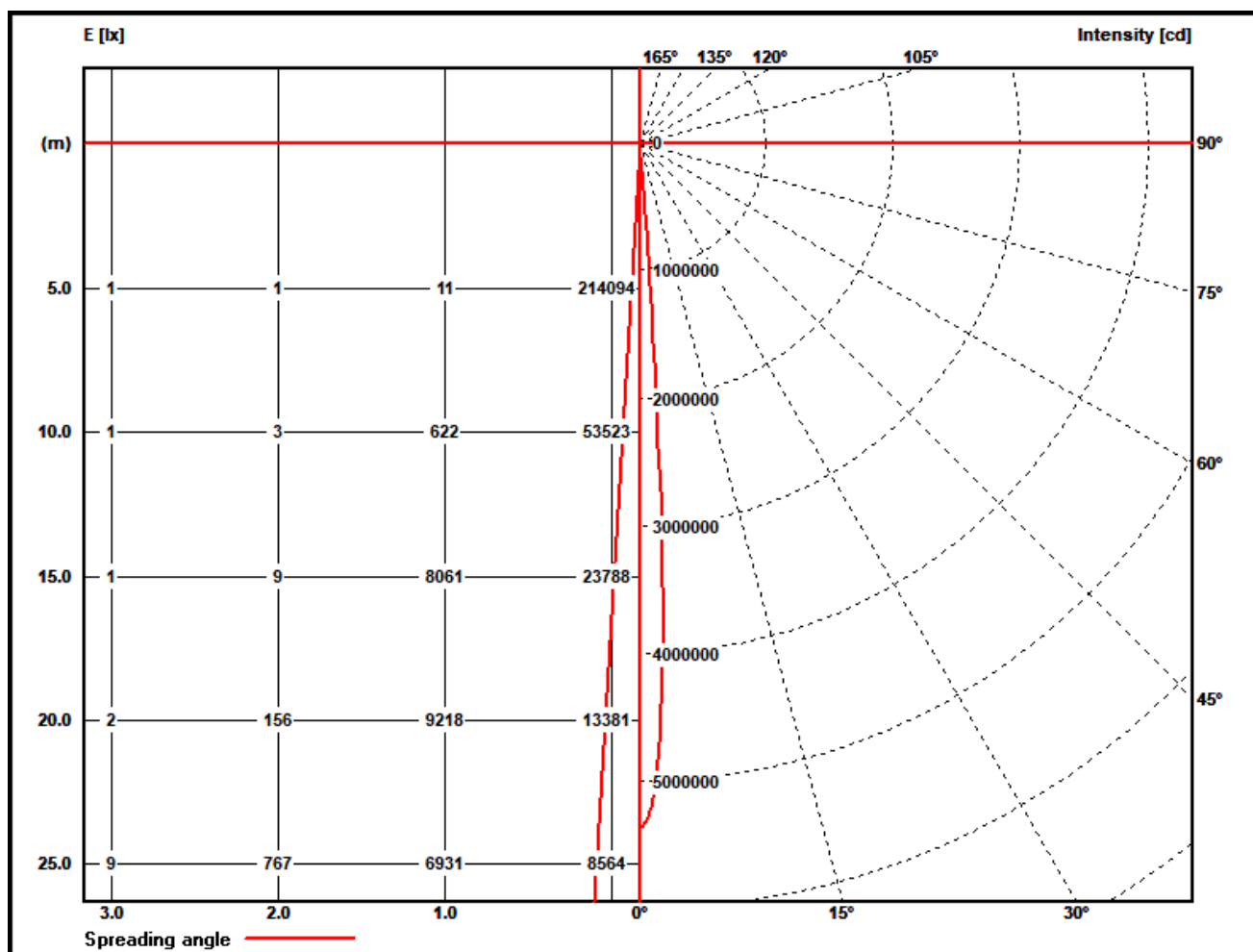
Polar diagram MAC Ultra Wash - narrow



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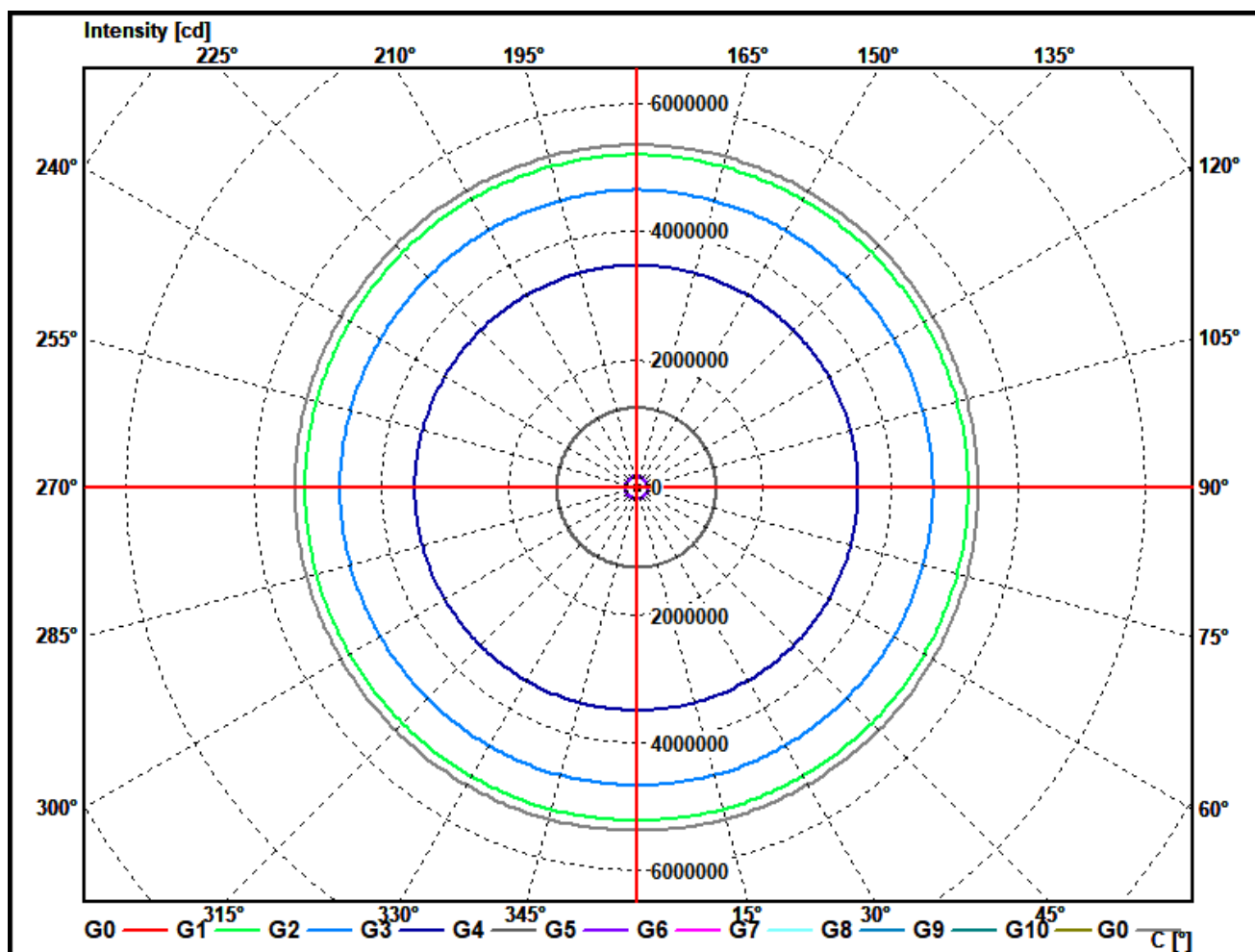
Illuminance and Intensity diagram MAC Ultra Wash - narrow



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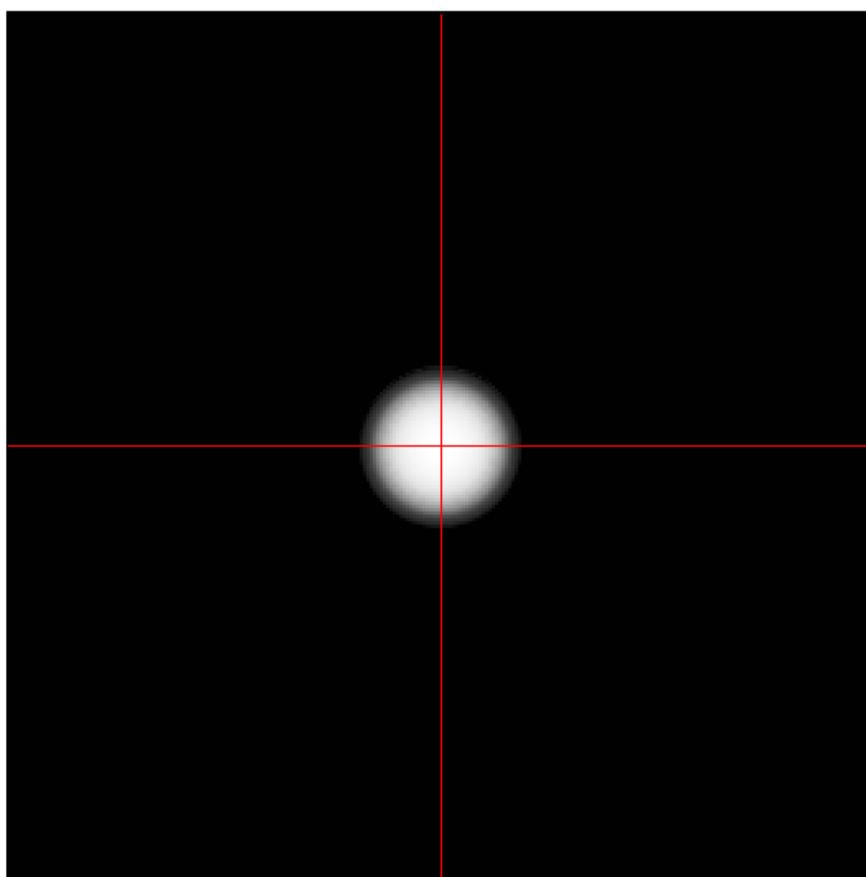
Cone diagram MAC Ultra Wash - narrow



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Isoline diagram MAC Ultra Wash - narrow



Luminaire mounting height above ground: 15 m
Luminaire rotation angle: 0 °

testsample:

dimensions [L x W x H]: 300 x 450 x 855 mm



test equipment - ILUmetriX GmbH

- goniophotometer with mirror arrangement GO-DS 2000 No.: 09A84831	Manufacturer: LMT GmbH, Berlin
- Photometer head GO-DS 2000, Nr.: 09A84812	Manufacturer: LMT GmbH, Berlin
- integrating sphere UL 1650/2250, Nr.: 09A8482	Manufacturer: LMT GmbH, Berlin
- colormeter C 1210 with colorimeterhead CH60	Manufacturer: LMT GmbH, Berlin
- power supply, Chroma 6415	Manufacturer: Chroma ATE INC.
- powermeter, Yokogawa WT 2010	Manufacturer: Yokogawa, Japan

calibration data:

goniophotometer with mirror arrangement

photometer unit with photometer head SP30S0T-GODS Serial No.: 09A84811 mit 09A84812	October 2018
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integrating sphere

colormeter with colorimeterhead Type: C 1210 with CH 60 serial No. 09A84831 mit 09A84832	October 2018
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