

customer:

date: 13.08.2021

Harman Professional Denmark ApS.
Olof Plames Allé 14

8200 Aarhus N
Denmark

project No: 21000131-3

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 Performance - medium

Serial No.: 15063403503

power supply: Electronics, integrated

DMX settings: zoom: 23552
focus: 40192
Fans: Constant Fan Full

test sample dimensions:

luminaire dimensions:

length:	300 mm
width:	450 mm
height:	865 mm
diameter:	- mm

dimensions of luminant areas:

length:	- mm
width:	- mm
height:	- mm
diameter:	160 mm

measurement configuration:

	area	step size
C- planes	0 - 360°	1°
γ- angle	0 - 15°	1°
	15 - 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
-	46901,67 lm	46901,67 lm
-	100 %	100 %

max. luminous intensity: 360274,0 cd @ ($\gamma=0^\circ/C=0^\circ$)
 beam angles:

half beam 50 % :	24,6°
field angle 10% :	27,3°
cutoff angel 3% :	27,8°

symmetry condition: rotational symmetric

luminous efficiency: 33,44 lm/W

electrical operating conditions:

voltage:	230,0 V (const. < 0.1%)
current:	6,135 A
system power:	1402,50 W
power factor:	0,994

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, 13.08.2021



F. Siepe (Management Board)



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	page 10	testsample
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PHOTOMETRIC RESULTS

Manufacturer:	Harman Professional ApS	Voltage:	230,05 V
Name:	MAC Ultra Performance - medium	Current:	6,135 A
Report:	21000131-3	System Power:	1402,5 W
Date:	12.08.2021 15:18:37		
Operator:	F. Siepe	No. of lamps:	1
		MAC Ultra Performance - medium	
Luminaire dimensions:			
Length:	300 mm		
Height:	865 mm		
Width:	450 mm		
Diameter:	0 mm		

Cones (C0-359-1, G0-90-1/5, 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:	24,6°	24,6°	
Half peak side angle (left):	-12,3°	-12,3°	
Half peak side angle (right):	12,3°	12,3°	
One tenth peak divergence:	27,3°	27,3°	
Tenth peak side angle (left):	-13,6°	-13,6°	
Tenth peak side angle (right):	13,6°	13,6°	

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Intensity [cd] MAC Ultra Performance - medium

G/C [cd]	0,0
0,0	360274,0
1,0	360003,5
2,0	358849,3
3,0	356663,9
4,0	352782,5
5,0	348296,3
6,0	341683,8
7,0	331386,8
8,0	317278,5
9,0	301183,7
10,0	279454,0
11,0	251449,8
12,0	219705,1
13,0	96685,5
14,0	1928,2
15,0	1100,3
20,0	224,5
25,0	83,8
30,0	40,1
35,0	26,5
40,0	17,2
45,0	12,0
50,0	9,4
55,0	7,9
60,0	9,2
65,0	2,6
70,0	1,5
75,0	0,3
80,0	0,1
85,0	0,1
90,0	0,1

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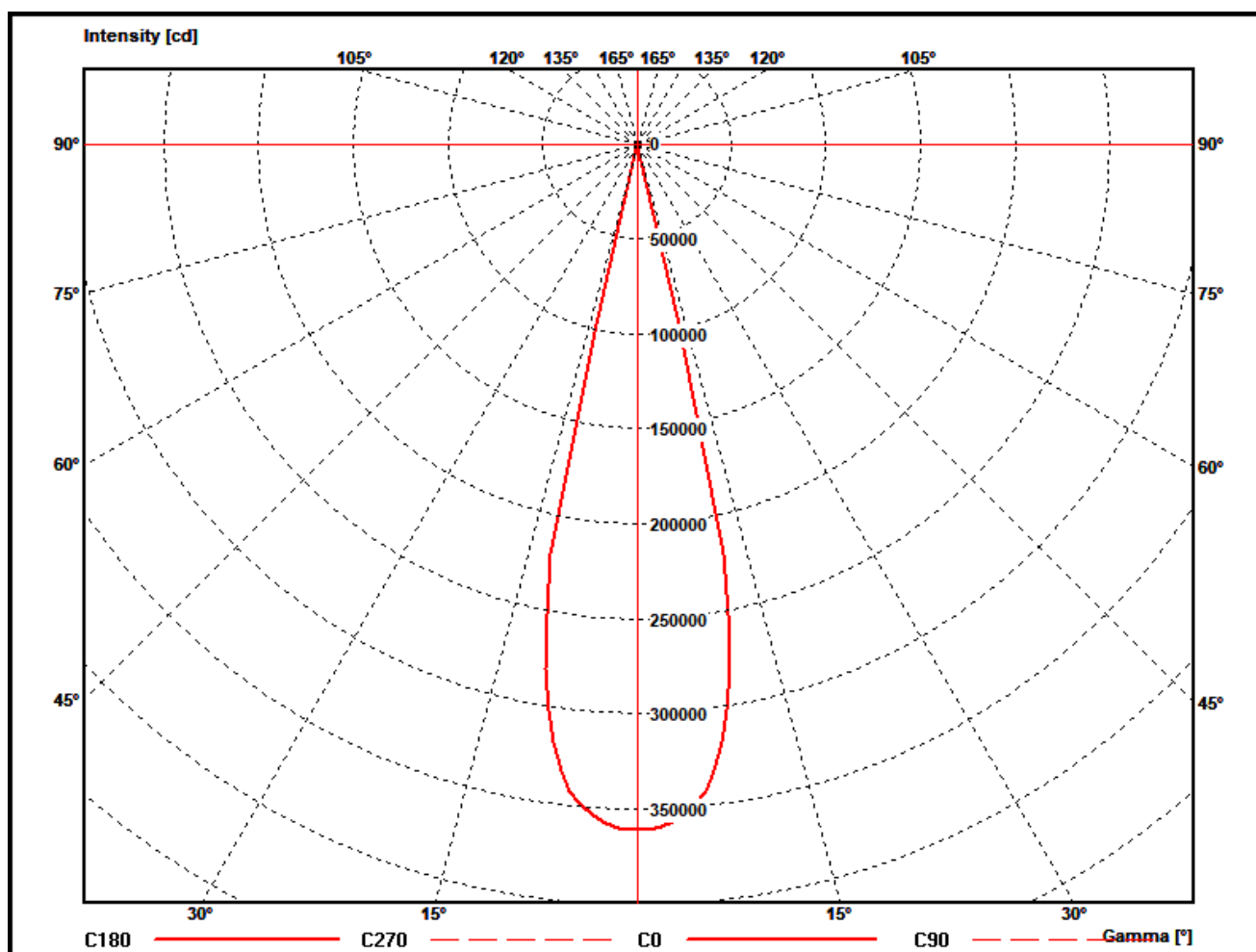
Zonal flux MAC Ultra Performance - medium

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	7681,5	7681,5	7681,5	0,00	0,00	0,00	0,00
1,0	7675,7	7675,7	7675,7	344,64	344,64	0,73	0,73
2,0	7651,1	7651,1	7651,1	1031,77	1376,40	2,20	2,93
3,0	7604,5	7604,5	7604,5	1711,27	3087,68	3,65	6,58
4,0	7521,7	7521,7	7521,7	2374,74	5462,42	5,06	11,65
5,0	7426,1	7426,1	7426,1	3016,00	8478,42	6,43	18,08
6,0	7285,1	7285,1	7285,1	3626,03	12104,45	7,73	25,81
7,0	7065,6	7065,6	7065,6	4177,74	16282,19	8,91	34,72
8,0	6764,8	6764,8	6764,8	4642,37	20924,56	9,90	44,61
9,0	6421,6	6421,6	6421,6	5012,30	25936,86	10,69	55,30
10,0	5958,3	5958,3	5958,3	5254,56	31191,42	11,20	66,50
11,0	5361,2	5361,2	5361,2	5304,82	36496,23	11,31	77,81
12,0	4684,4	4684,4	4684,4	5150,40	41646,63	10,98	88,80
13,0	2061,5	2061,5	2061,5	3754,76	45401,39	8,01	96,80
14,0	41,1	41,1	41,1	1262,25	46663,64	2,69	99,49
15,0	23,5	23,5	23,5	41,58	46705,22	0,09	99,58
20,0	4,8	4,8	4,8	109,18	46814,40	0,23	99,81
25,0	1,8	1,8	1,8	32,34	46846,74	0,07	99,88
30,0	0,9	0,9	0,9	15,69	46862,43	0,03	99,92
35,0	0,6	0,6	0,6	9,82	46872,25	0,02	99,94
40,0	0,4	0,4	0,4	7,29	46879,54	0,02	99,95
45,0	0,3	0,3	0,3	5,40	46884,94	0,01	99,96
50,0	0,2	0,2	0,2	4,33	46889,27	0,01	99,97
55,0	0,2	0,2	0,2	3,76	46893,03	0,01	99,98
60,0	0,2	0,2	0,2	3,96	46896,98	0,01	99,99
65,0	0,1	0,1	0,1	2,89	46899,88	0,01	100,00
70,0	0,0	0,0	0,0	1,06	46900,94	0,00	100,00
75,0	0,0	0,0	0,0	0,48	46901,42	0,00	100,00
80,0	0,0	0,0	0,0	0,12	46901,54	0,00	100,00
85,0	0,0	0,0	0,0	0,07	46901,61	0,00	100,00
90,0	0,0	0,0	0,0	0,05	46901,66	0,00	100,00

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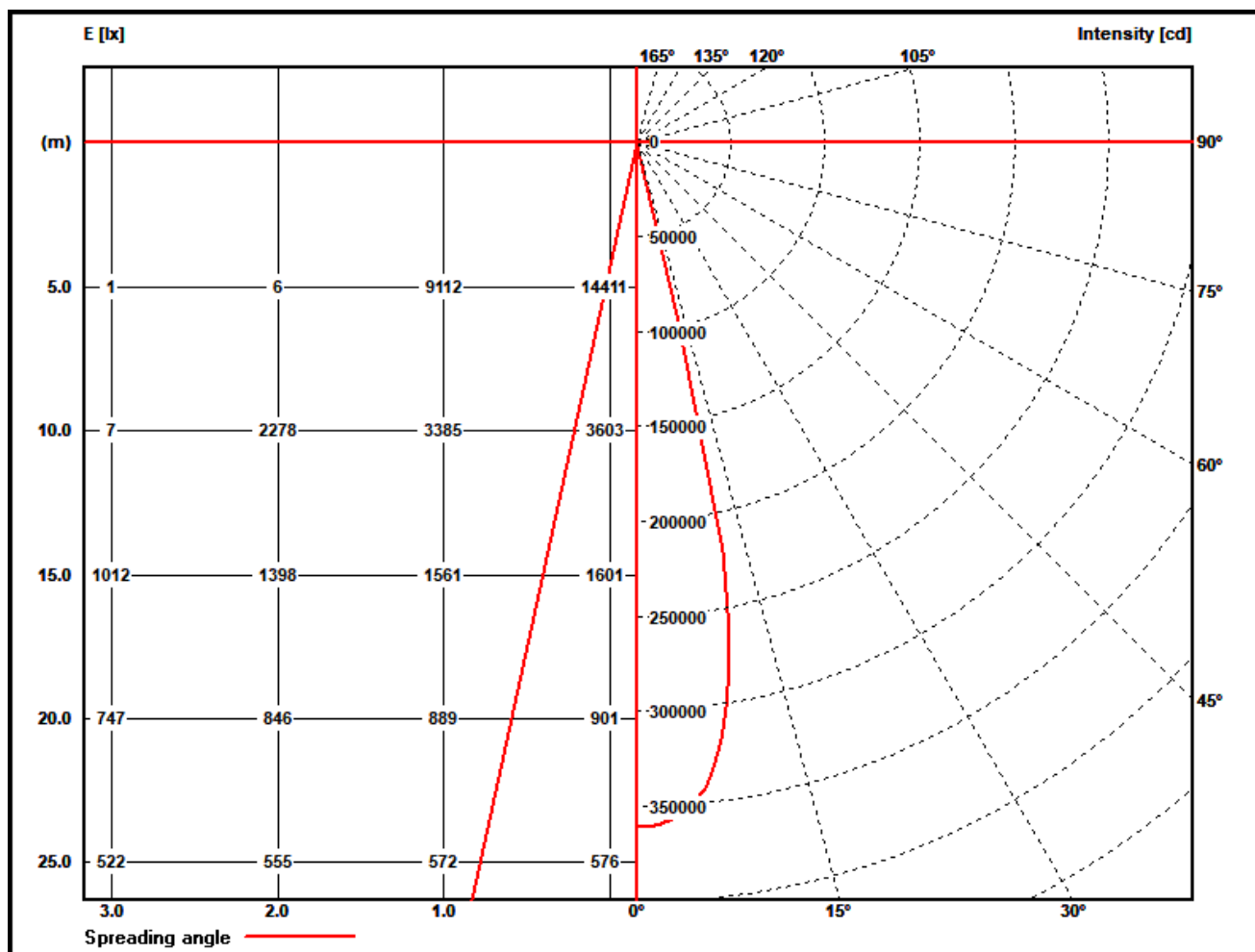
Polar diagram MAC Ultra Performance - medium



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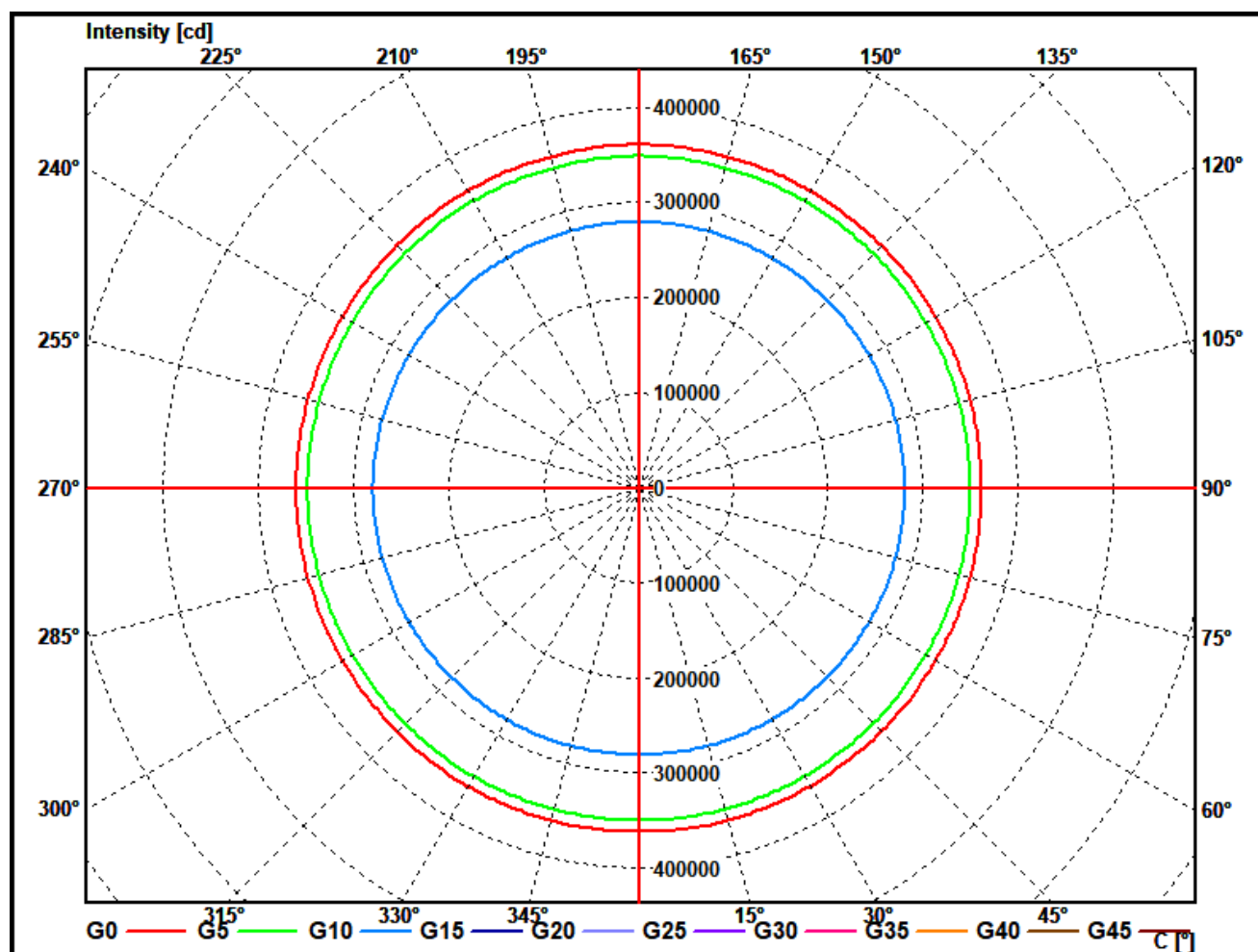
Illuminance and Intensity diagram MAC Ultra Performance - medium



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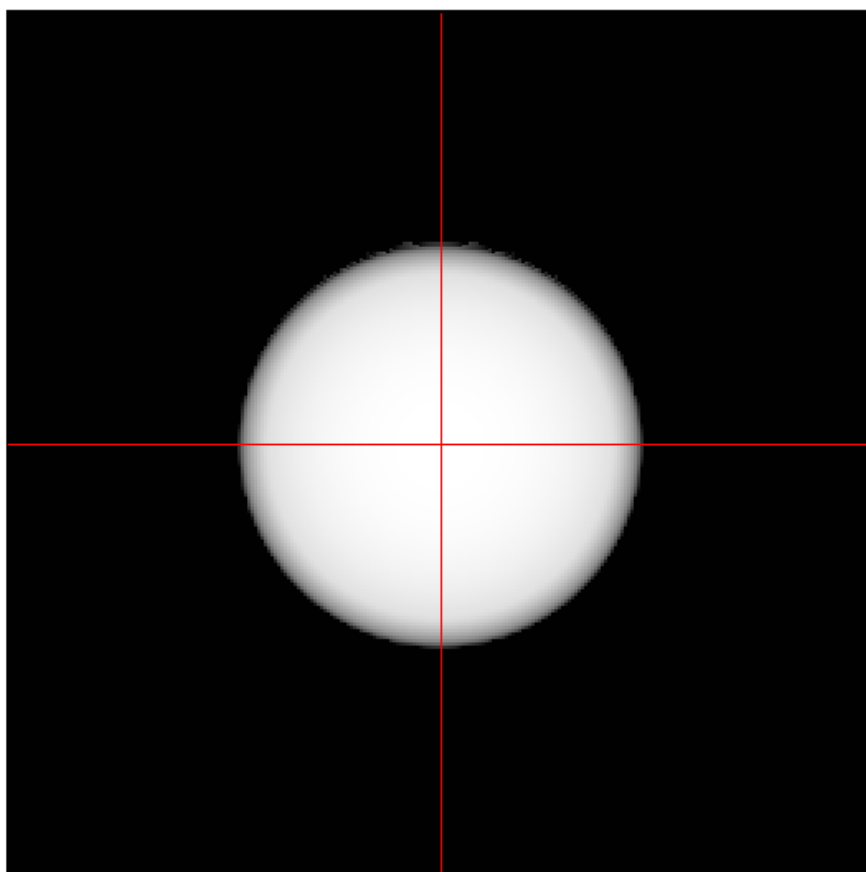
Cone diagram MAC Ultra Performance - medium



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Isoline diagram MAC Ultra Performance - medium



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

testsample:

dimensions [L x W x H]: 300 x 450 x 865 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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