

customer:

date: 13.08.2021

Harman Professional Denmark ApS.  
Olof Plames Allé 14

8200 Aarhus N  
Denmark

project No: 21000131-2

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 - 10°

Serial No.: 15063403503

power supply: Electronics, integrated

DMX settings: zoom: 52736  
focus: 29056  
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 - 10°	0.5°
	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: &lt; 1%

luminous flux:

upper half space	lower half space	overall
-	39792,87 lm	39792,87 lm
-	100 %	100 %

max. luminous intensity: 2473138,0 cd @ (γ=0°/C=0°)

 beam angles:  
 half beam 50 % : 8,4°  
 field angle 10% : 10,4°  
 cutoff angel 3% : 11,0°

symmetry condition: rotational symmetric

luminous efficiency: 28,38 lm/W

electrical operating conditions:
 voltage: 230,0 V (const. < 0.1%)  
 current: 6,135 A  
 system power: 1402,30 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)


 annex: page 3-9 testreport  
 page 10 testsample  
 page 11 testequipment

## PHOTOMETRIC RESULTS

Manufacturer:	Harman Professional ApS	Voltage:	230,05 V
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Report:	21000131-2	System Power:	1402,3 W
Date:	12.08.2021 14:37:50		
Operator:	F. Siepe	No. of lamps:	1
		MAC Ultra Performance - 10°	
Luminaire dimensions:			
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Width:	450 mm		
Diameter:	0 mm		

## Cones (C0-359-1, G0-90-1/25, S7)

<b>LiTG-class:</b>	A60		
<b>UTE-class:</b>	Not available		
<b>IES-class:</b>	100 - 100 - 100 - 100 - 100		
<b>TM5-class:</b>	Not available		
<b>Divergences in the plane through maximum intensity:</b>	Horizontal	Vertical	
<b>One half peak divergence:</b>	8,4°	8,4°	
<b>Half peak side angle (left):</b>	-4,2°	-4,2°	
<b>Half peak side angle (right):</b>	4,2°	4,2°	
<b>One tenth peak divergence:</b>	10,4°	10,4°	
<b>Tenth peak side angle (left):</b>	-5,2°	-5,2°	
<b>Tenth peak side angle (right):</b>	5,2°	5,2°	

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### Intensity [cd] MAC Ultra Performance - 10°

G/C [cd]	0,0
0,0	2473138,0
0,5	2464553,0
1,0	2439839,0
1,5	2370032,0
2,0	2268126,0
2,5	2088567,0
3,0	1937131,0
3,5	1726665,0
4,0	1415805,0
4,5	944753,0
5,0	415250,3
5,5	8897,7
6,0	5638,4
6,5	3979,8
7,0	3125,5
7,5	2526,9
8,0	1965,4
8,5	1734,7
9,0	1473,4
9,5	1241,0
10,0	1065,5
15,0	312,2
20,0	147,6
25,0	87,7
30,0	59,6
35,0	45,1
40,0	35,2
45,0	28,9
50,0	24,8
55,0	23,9
60,0	12,5
65,0	7,4
70,0	4,3
75,0	0,9
80,0	0,2
85,0	0,1
90,0	0,1

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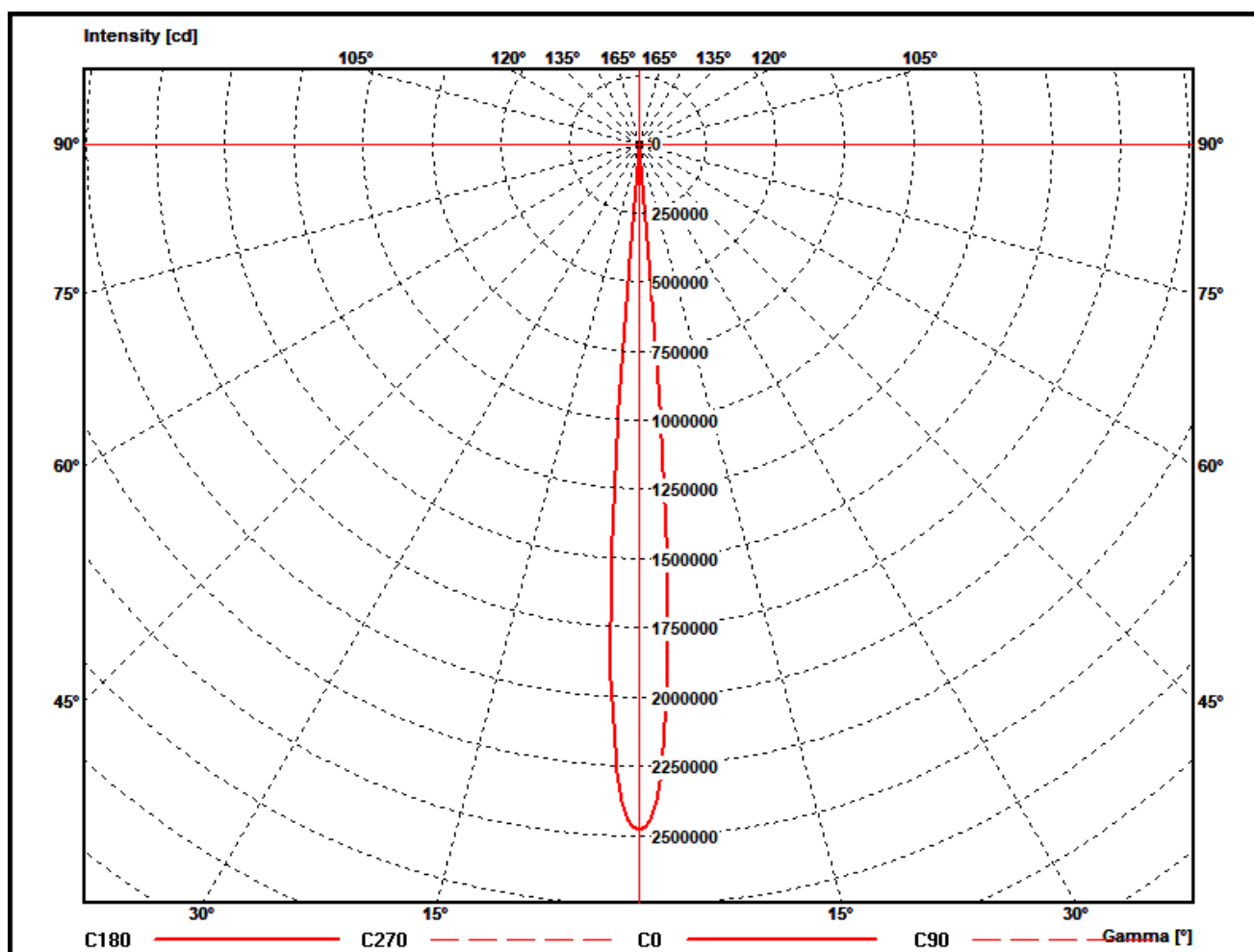
### Zonal flux MAC Ultra Performance - 10°

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	62150,3	62150,3	62150,3	0,00	0,00	0,00	0,00
0,5	61934,5	61934,5	61934,5	590,66	590,66	1,48	1,48
1,0	61313,5	61313,5	61313,5	1759,98	2350,64	4,42	5,91
1,5	59559,2	59559,2	59559,2	2876,62	5227,25	7,23	13,14
2,0	56998,3	56998,3	56998,3	3883,20	9110,45	9,76	22,89
2,5	52486,0	52486,0	52486,0	4689,23	13799,67	11,78	34,68
3,0	48680,4	48680,4	48680,4	5295,18	19094,85	13,31	47,99
3,5	43391,3	43391,3	43391,3	5694,49	24789,34	14,31	62,30
4,0	35579,4	35579,4	35579,4	5634,63	30423,97	14,16	76,46
4,5	23741,8	23741,8	23741,8	4795,99	35219,97	12,05	88,51
5,0	10435,3	10435,3	10435,3	3087,52	38307,48	7,76	96,27
5,5	223,6	223,6	223,6	1064,00	39371,48	2,67	98,94
6,0	141,7	141,7	141,7	39,93	39411,41	0,10	99,04
6,5	100,0	100,0	100,0	28,71	39440,12	0,07	99,11
7,0	78,5	78,5	78,5	22,90	39463,01	0,06	99,17
7,5	63,5	63,5	63,5	19,56	39482,57	0,05	99,22
8,0	49,4	49,4	49,4	16,61	39499,18	0,04	99,26
8,5	43,6	43,6	43,6	14,56	39513,73	0,04	99,30
9,0	37,0	37,0	37,0	13,38	39527,11	0,03	99,33
9,5	31,2	31,2	31,2	11,96	39539,07	0,03	99,36
10,0	26,8	26,8	26,8	10,71	39549,79	0,03	99,39
15,0	7,8	7,8	7,8	81,73	39631,51	0,21	99,59
20,0	3,7	3,7	3,7	37,90	39669,40	0,10	99,69
25,0	2,2	2,2	2,2	24,68	39694,09	0,06	99,75
30,0	1,5	1,5	1,5	18,64	39712,72	0,05	99,80
35,0	1,1	1,1	1,1	15,41	39728,14	0,04	99,84
40,0	0,9	0,9	0,9	13,41	39741,54	0,03	99,87
45,0	0,7	0,7	0,7	11,87	39753,41	0,03	99,90
50,0	0,6	0,6	0,6	10,84	39764,25	0,03	99,93
55,0	0,6	0,6	0,6	10,59	39774,84	0,03	99,95
60,0	0,3	0,3	0,3	8,43	39783,27	0,02	99,98
65,0	0,2	0,2	0,2	4,86	39788,13	0,01	99,99
70,0	0,1	0,1	0,1	2,97	39791,09	0,01	100,00
75,0	0,0	0,0	0,0	1,36	39792,46	0,00	100,00
80,0	0,0	0,0	0,0	0,29	39792,75	0,00	100,00
85,0	0,0	0,0	0,0	0,07	39792,82	0,00	100,00
90,0	0,0	0,0	0,0	0,05	39792,88	0,00	100,00

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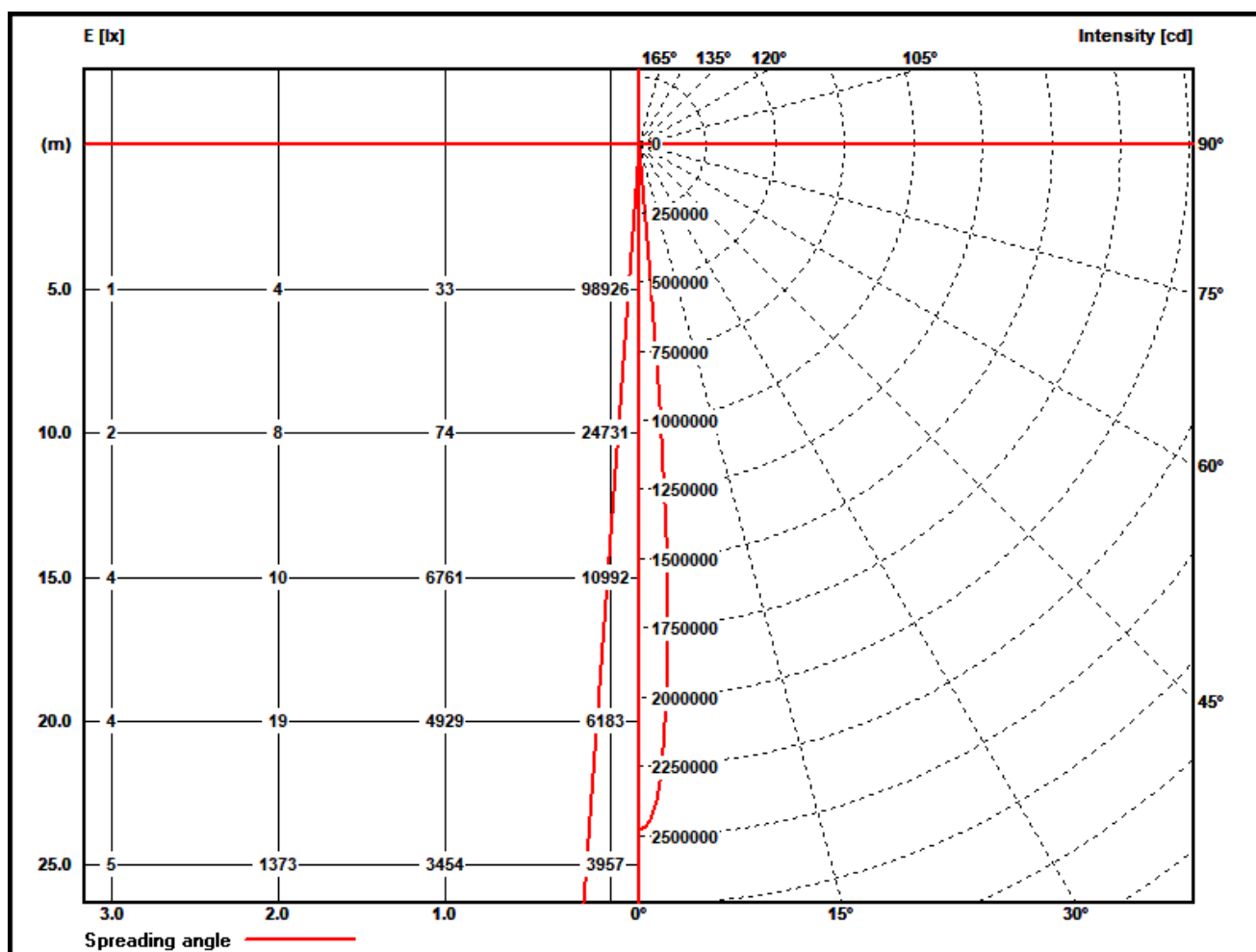
### Polar diagram MAC Ultra Performance - 10°



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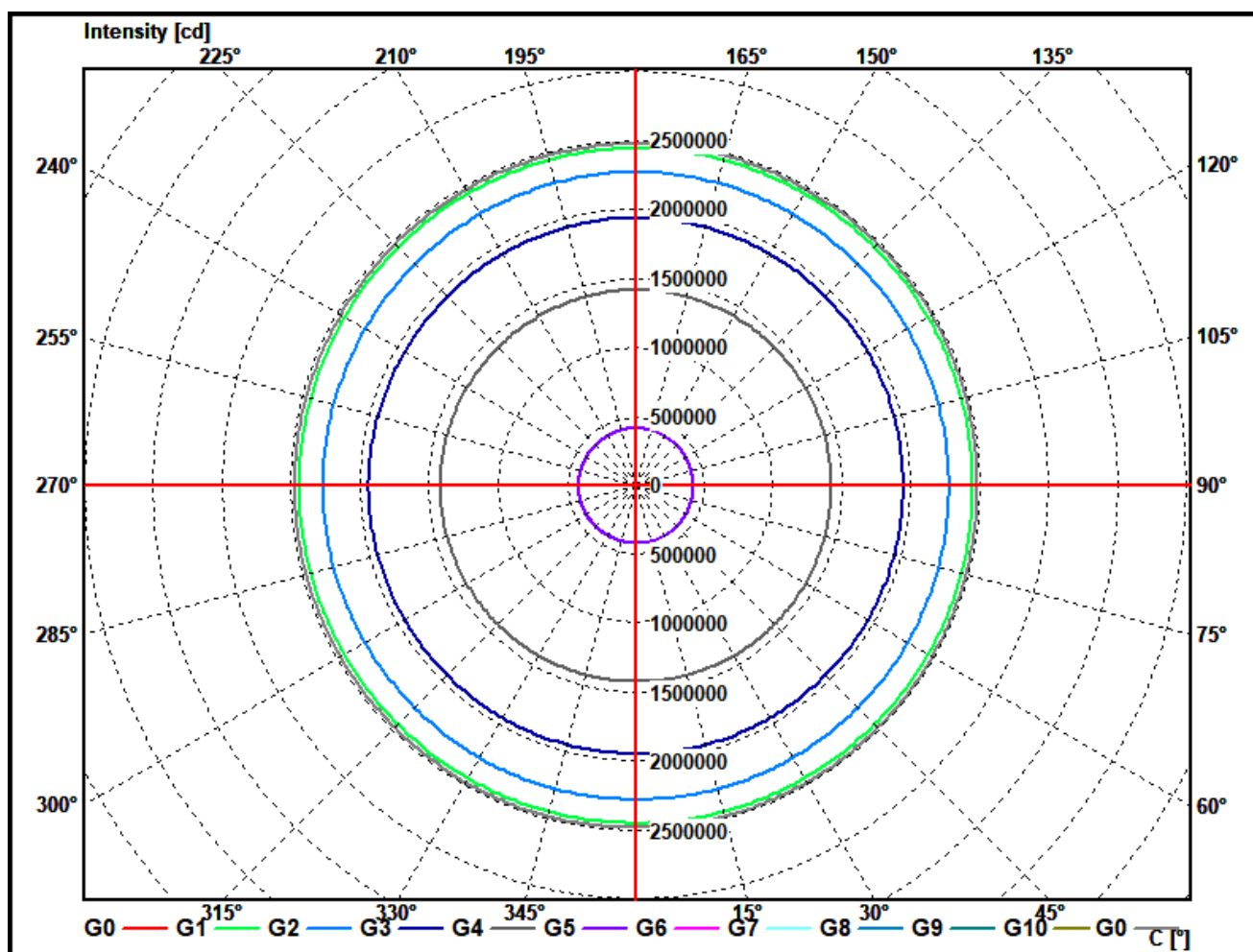
### Illuminance and Intensity diagram MAC Ultra Performance - 10°



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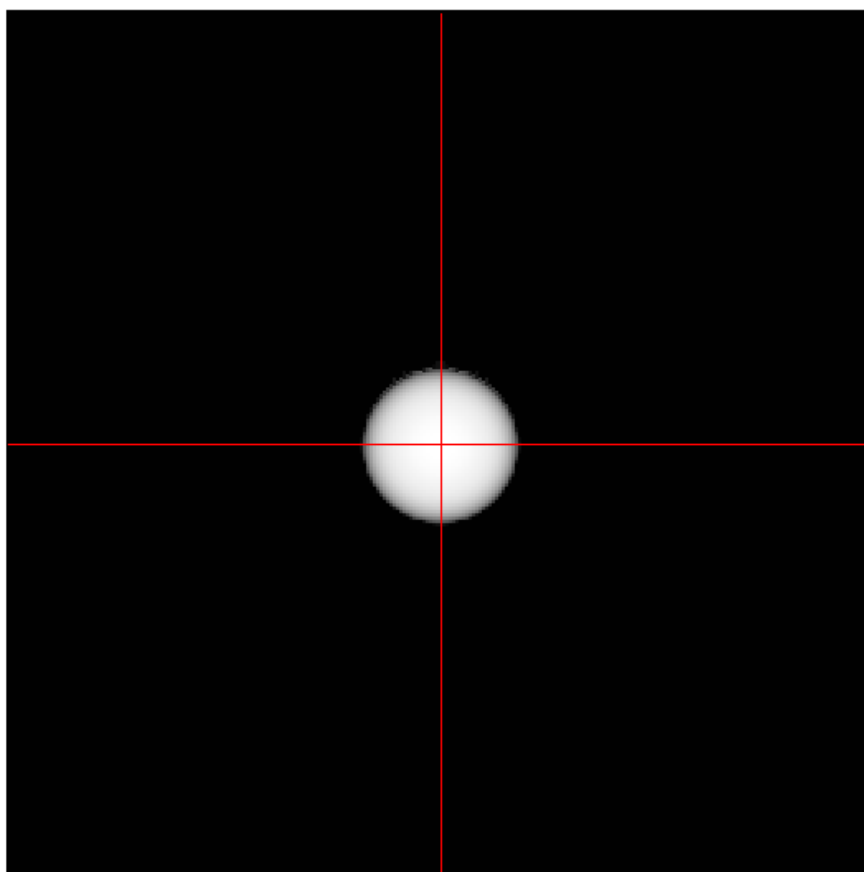




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### Isoline diagram MAC Ultra Performance - 10°



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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