Technical application guide

Philips MASTER LEDspot D PAR20

A dimmable LED replacement for a halogen (50 W) spot that provides an intense beam of white light.

The design of the MASTER LEDspot PAR20 integrates a high power LED light source with an excellent thermal management solution in a standard halogen form-factor. This replacement lamp on 230 V provides the light intensity and quality produced by traditional halogen lamps of 50 W.

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sense and simplicity

Design highlights

- Up to 85% energy saving compared to standard halogen spots
- Long lifetime of 45,000 hours (B50, L70)
- Operates at 230 V AC and its form-factor is designed as a direct retrofit into all E27 holders
- CCT: 2700 K, 3000 K and 4000 K
- No UV and Cool Beam (no IR)
- Environmental friendly, without Mercury or any other hazardous substances
- RoHS compliant

Application areas

With its robust design and warm-white beam of light, this new generation PAR lamp is ideal for general lighting and spot lighting in the hospitality industry and OEM equipment lighting. It is especially suitable for public areas such as lobbies, corridors and stairwells, where the light is always on.
It is compatible with existing fixtures with an E27 holder and designed for retrofit replacement of 50 W halogen lamps. MASTER LEDspot PAR20 delivers huge energy savings and minimizes maintenance costs without any reduction in brightness.

Application notes

- Operating temperature range is between -20 °C and 45 °C ambient
- Only to apply in dry indoor environments and most of open fixtures with E27 lamp-holders that offer sufficient space (10mm free air space)
- Not intended for use with emergency light fixtures or exit lights
- For use in fixtures that can structurally support a lamp weighing 0.156 kilogram

Technical specification

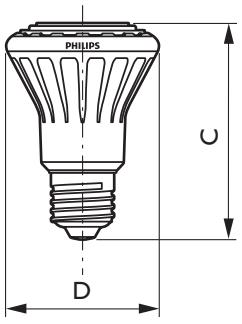
Product type	Voltage	Wattage	Base	Lamp shape	Color temp.	Beam angle	Lifetime	CRI	Dimmable
	V	W			K	D	hours		
MASTER LEDspot D 7-50W PAR20	230	7	E27	PAR20	2700	25	45.000	>80	Yes
MASTER LEDspot D 7-50W PAR20	230	7	E27	PAR20	2700	40	45.000	>80	Yes
MASTER LEDspot D 7-50W PAR20	230	7	E27	PAR20	3000	25	45.000	>80	Yes
MASTER LEDspot D 7-50W PAR20	230	7	E27	PAR20	3000	40	45.000	>80	Yes
MASTER LEDspot D 7-50W PAR20	230	7	E27	PAR20	4000	25	45.000	>80	Yes
MASTER LEDspot D 7-50W PAR20	230	7	E27	PAR20	4000	40	45.000	>80	Yes

Ordering details

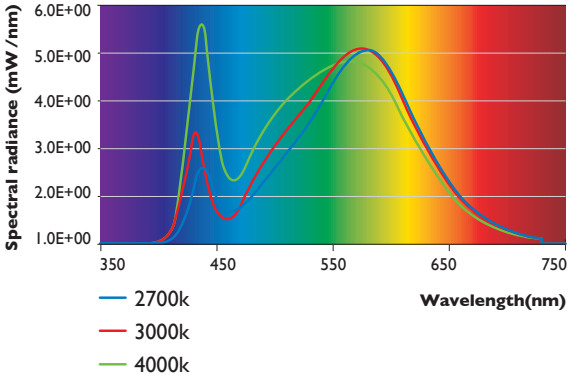
Product name	12NC 9290001	Minimum order quantity	Outer box (pieces per)	Pallet (pieces per)	Pack type	Warranty (years)
MASTER LEDspot D 7-50W 2700K PAR20 25D	74402	6	6	798	CT	3
MASTER LEDspot D 7-50W 3000K PAR20 25D	74502	6	6	798	CT	3
MASTER LEDspot D 7-50W 4000K PAR20 25D	74602	6	6	798	CT	3
MASTER LEDspot D 7-50W 2700K PAR20 40D	74702	6	6	798	CT	3
MASTER LEDspot D 7-50W 3000K PAR20 40D	74802	6	6	798	CT	3
MASTER LEDspot D 7-50W 4000K PAR20 40D	74902	6	6	798	CT	3

Dimensions

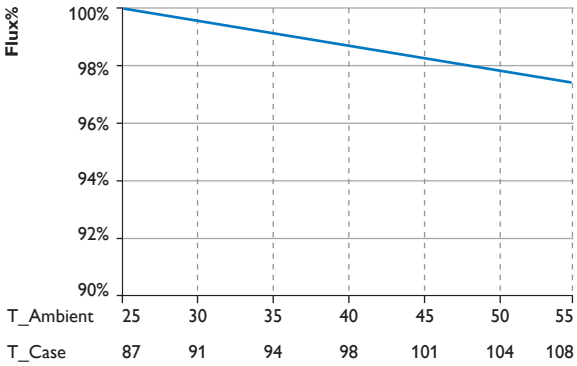
Type	C max. Overall Length (mm)	D max. Diameter (mm)
MASTER LEDspot D 7-50W PAR20	90.2	63.7



Spectral Power Distribution



Temperature



T_Ambient	25	30	35	40	45	50	55
T_Case	87	91	94	98	101	104	108

ΔT=101

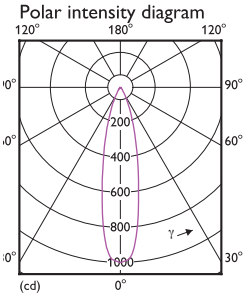
T_c Max: 101 °C

Photometric diagrams

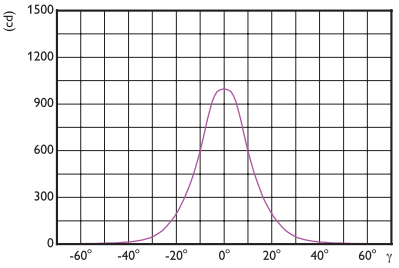
MasterLEDspot D PAR20 25D 2700 K

Light output ratio	1.01	BS ($\frac{1}{2}I_{max}$)	2 x 12°
Service upward	0.00	BS ($\frac{1}{2}E_0$)	2 x 12°
Service downward	1.01		
		K5	
Imax	1000 cd		

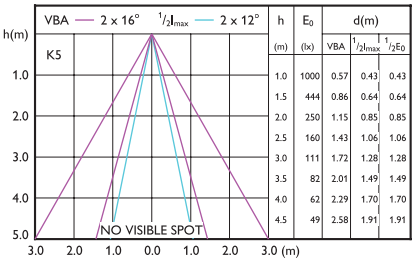
Polar intensity diagram



Cartesian intensity diagram

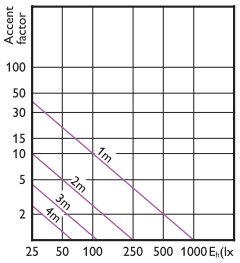


Beam diagram



h (m)	E_0 (lx)	d(m) VBA	d(m) $\frac{1}{2}I_{max}$	d(m) $\frac{1}{2}E_0$
1.0	1000	0.57	0.43	0.43
1.5	444	0.86	0.64	0.64
2.0	250	1.15	0.85	0.85
2.5	160	1.43	1.06	1.06
3.0	111	1.72	1.28	1.28
3.5	82	2.01	1.49	1.49
4.0	62	2.29	1.70	1.70
4.5	49	2.58	1.91	1.91

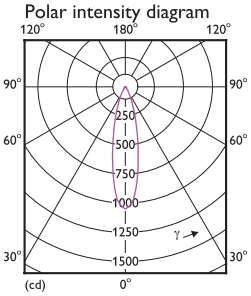
Visual impact diagram



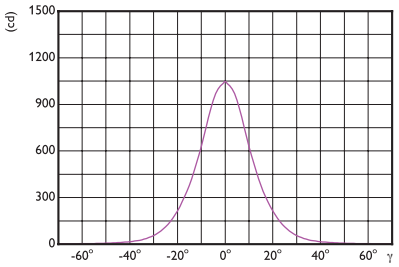
MasterLEDspot D PAR20 25D 3000 K

Light output ratio	1.04	BS ($\frac{1}{2}I_{max}$)	2 x 12°
Service upward	0.00	BS ($\frac{1}{2}E_0$)	2 x 12°
Service downward	1.04		
		K5	
Imax	1050 cd		

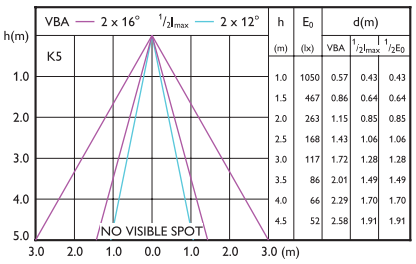
Polar intensity diagram



Cartesian intensity diagram

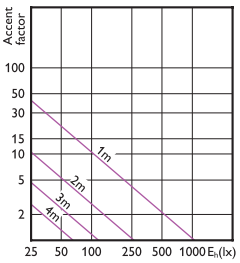


Beam diagram



h (m)	E_0 (lx)	d(m) VBA	d(m) $\frac{1}{2}I_{max}$	d(m) $\frac{1}{2}E_0$
1.0	1050	0.57	0.43	0.64
1.5	467	0.86	0.64	0.64
2.0	263	1.15	0.85	0.85
2.5	168	1.43	1.06	1.06
3.0	117	1.72	1.28	1.28
3.5	86	2.01	1.49	1.49
4.0	66	2.29	1.70	1.70
4.5	52	2.58	1.91	1.91

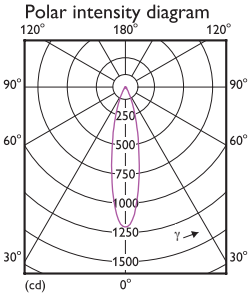
Visual impact diagram



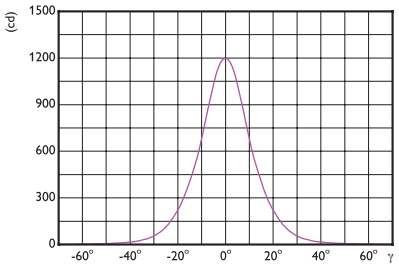
MasterLEDspot D PAR20 25D 4000 K

Light output ratio	1.03	BS ($\frac{1}{2}I_{max}$)	2 x 12°
Service upward	0.00	BS ($\frac{1}{2}E_0$)	2 x 11°
Service downward	1.03		
		K5	
Imax	1200 cd		

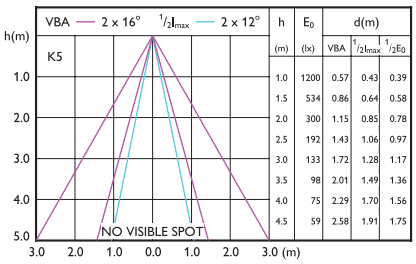
Polar intensity diagram



Cartesian intensity diagram

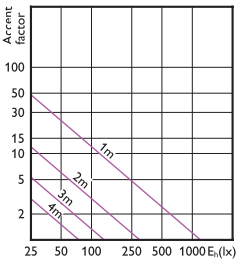


Beam diagram



h (m)	E_0 (lx)	d(m) VBA	d(m) $\frac{1}{2}I_{max}$	d(m) $\frac{1}{2}E_0$
1.0	1200	0.57	0.43	0.39
1.5	534	0.86	0.64	0.58
2.0	300	1.15	0.85	0.78
2.5	192	1.43	1.06	0.97
3.0	133	1.72	1.28	1.17
3.5	98	2.01	1.49	1.36
4.0	75	2.29	1.70	1.56
4.5	59	2.58	1.91	1.75

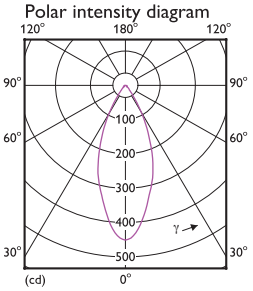
Visual impact diagram



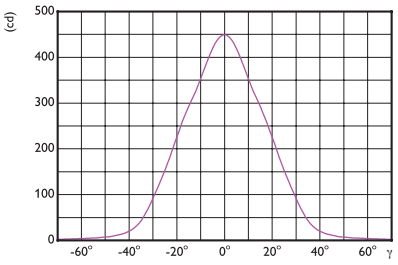
MasterLEDspot D PAR20 40D 2700 K

Light output ratio	0.95	BS ($\frac{1}{2}I_{max}$)	2 x 21°
Service upward	0.00	BS ($\frac{1}{2}E_0$)	2 x 18°
Service downward	0.95		
		K5	
Imax	450 cd		

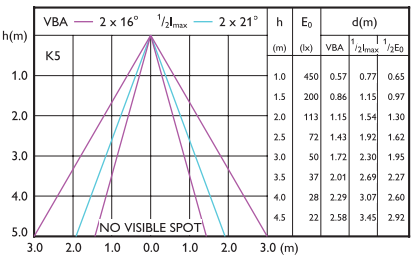
Polar intensity diagram



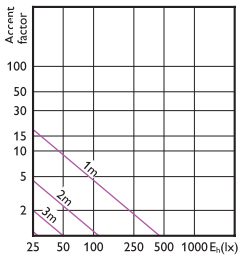
Cartesian intensity diagram



Beam diagram



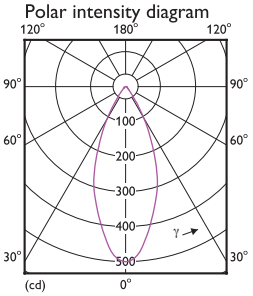
Visual impact diagram



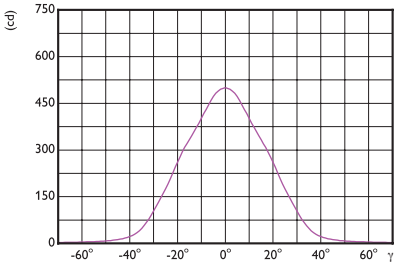
MasterLEDspot D PAR20 40D 3000 K

Light output ratio	1.03	BS ($\frac{1}{2}I_{max}$)	2 x 21°
Service upward	0.00	BS ($\frac{1}{2}E_0$)	2 x 19°
Service downward	1.03		
		K5	
Imax	500 cd		

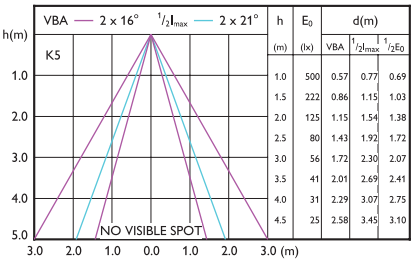
Polar intensity diagram



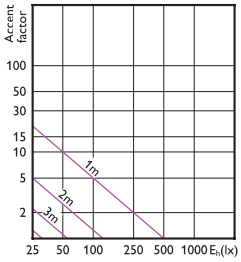
Cartesian intensity diagram



Beam diagram



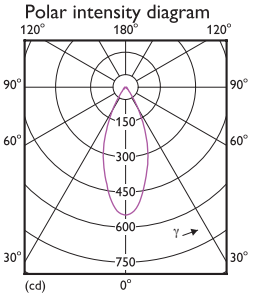
Visual impact diagram



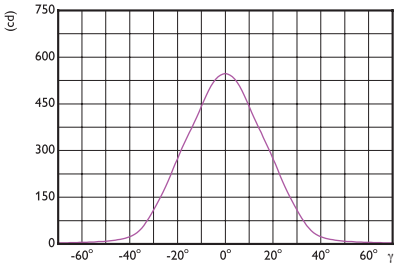
MasterLEDspot D PAR20 40D 4000 K

Light output ratio	1.03	BS ($\frac{1}{2}I_{max}$)	2 x 21°
Service upward	0.00	BS ($\frac{1}{2}E_0$)	2 x 18°
Service downward	1.03		
		K5	
Imax	548 cd		

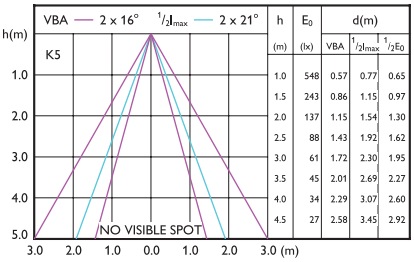
Polar intensity diagram



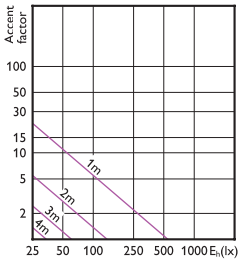
Cartesian intensity diagram



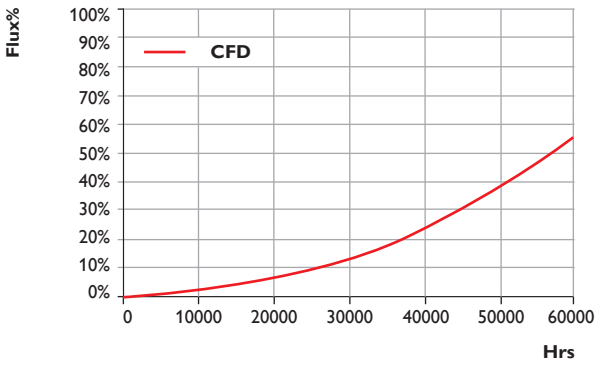
Beam diagram



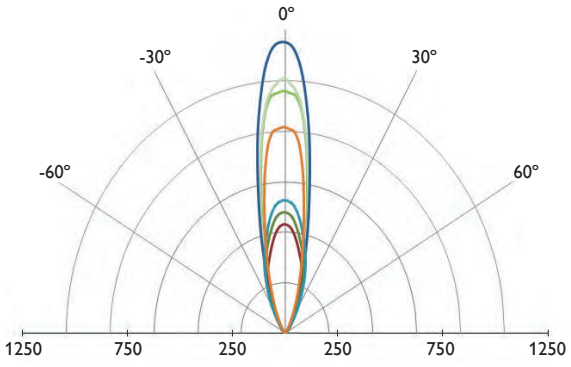
Visual impact diagram



Lifetime and sustainability



Polar diagram comparison



- Philips PAR20 7-50W 2700K 25D
- Philips PAR20 7-50W 3000K 25D
- Philips PAR20 7-50W 4000K 25D
- Philips PAR20 7-50W 2700K 40D
- Philips PAR20 7-50W 3000K 40D
- Philips PAR20 7-50W 4000K 40D
- Philips PAR20 Halogen Pro 50W 25D

Dimmer range & load capability

General information

- Philips LEDlamps are tested on more than 30 reference dimmers available globally
- MASTER LEDspot can work well with most of R, RL dimmers (leading edge dimmers), but not RC, RCL dimmers (trailing edge dimmers) nor any dimmers with neon/LED light indicator
- Wide dimming range: from 100% down to 10%

How to define the number of lamps which can be connected to one dimmer

We suggest the following generic rule

	The rule	Example Dimmer = 500 W LEDlamp = 7 W
Step 1	Divide the maximum Wattage of the dimmer by 10	$\frac{500\,W}{10}$ = 50 W
Step 2	Divide the result of step 1 by the Wattage of the LEDlamps	$\frac{50}{7}$ = 7 pieces, which is the max. number of LEDlamps you can connect to one dimmer

Recommended dimmers

You find a selection of recommended dimmers for the MASTER LEDspot PAR20 in the list below.

BRAND	TYPE NUMBER	DIMMER TYPE	LOAD (W)
Busch Jaeger	2247U	RL	500
Niko	09-013	R	60~300
Busch Jaeger	2250U	R	600
Busch Jaeger	2200		500
PEHA	435HAN	RL	60~600
PEHA	436	R	60~600
Legrand	67085		40~300
Crabtree	CPU-2W400		60~400
RVE	RV5		1000
Jung	225NV/DE	RL	20~500
N&L	28969/435 HAN	RL	60~600
OPUS	852.392	R	60~400
Jung	266 GDE	RL	60~600
Gira/Insta	30200100	R	60~600
OPUS	852.392	RL	20~500
Busch Jaeger	2247U	RL	500
Drespa	814		60~400
Berker	2830 10	R	60~400
Berker	2866 10	RL	20~500
N&L	28956/433/4	R	60~400
Relco	RT65ROA	R	60~500
Eltako	EUD61 NPN-UC	RLC	500
Eltako	FUD61 NPN-230V	RLC	300
OPUS	852.390	R	60~400
Schneider Electric	ALB45192	RL	40~400
Schneider Electric	MTN572599	RL	20~500
Schneider Electric	MTN572299	R	60~600

We advise you to visit the Philips Internet www.philips.com/masterled for the latest information about dimming your MASTER LEDlamps

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Data subject to change.

www.philips.com/masterled