



**PHILIPS**

MASTER LED



Technical Application Guide

# Philips MASTER LED MR16 ExpertColour

PHILIPS 12V MASTER LED MR16 ExpertColor 7.2-50W is the latest in Philips' series of LowVoltage (12VAC) Halogen MR16 replacements. Not only does it bring a warm spectrum which reaches that of a Halogen MR16 lamp, it also has a deep-dimming functionality that takes ambience to a new level.



[www.philips.com/masterledlamps](http://www.philips.com/masterledlamps)





# Design highlights

- ExpertColor MR16 simulate halogen light, make special light spectrum to close halogen light, more cozy light than other LED lamp
- Deep-dimming feature enable to create better ambiance in hospitality application, average to less than 5% light level
- Up to 85% energy saving compared to standard halogen MR16 lamps
- Long lifetime of 40,000 hours (F50, L70)
- Retrofits into vast majority of GU5.3 based fixtures
- Compatible with broad transformers
- 10, 24 & 36 degrees beam angle for a clearly defined beam spread
- CCT: 2700K, 3000K, 4000K
- No UV and Cool Beam (no IR)
- Environmental friendly, without Mercury or any other
- RoHS compliant

## Application areas

PHILIPS 12V MAS LED MR16 ExpertColor 7.2-50W lamp is suitably designed for spots lighting applications in hospitality and retail industries. Unlike the conventional halogen reflector lamp, PHILIPS 12V MAS LED MR16 ExpertColor 7.2-50W lamp, 7.2W power consumption per lamp, has a long lifetime of 40,000 hours ensuring minimum maintenance cost in hotels, restaurants, cafes and shops, especially suitable for various applications in the public areas such as:

- Corridors / Stairway / Washroom
- Lobby / Reception areas

## Application notes

- Operating temperature range is between -20°C and 40°C ambient
- Compatible with broad transformers (refer to the recommended transformer list), also suitable for 12V DC input
- Not intended for use with emergency light fixtures or exit lights
- For use in fixtures that can structurally support a lamp weighing 60 gram
- Do not use or install the lamp in wet environment
- Suitable for total enclosure fixture application (refer to failure rate curve, make sure Tc is not over max)

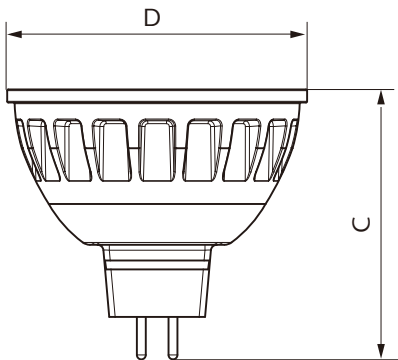
# Product features

## Technical Specifications

Product type	Voltage (VAC)	Power Wattage (W)	Replaced Wattage (W)	Base	Lumen (lm)	Beam Angle (°)	CCT (K)	Intensity (Cd)	Lifetime (Hrs)	CRI	Dimmable
MAS LED MR16 ExpertColor 7.2-50W 927 10D	12	7.2	50	GU5.3	450	10	2700	4500	40,000	97	Yes
MAS LED MR16 ExpertColor 7.2-50W 930 10D	12	7.2	50	GU5.3	480	10	3000	5000	40,000	97	Yes
MAS LED MR16 ExpertColor 7.2-50W 940 10D	12	7.2	50	GU5.3	480	10	4000	5000	40,000	97	Yes
MAS LED MR16 ExpertColor 7.2-50W 927 24D	12	7.2	50	GU5.3	450	24	2700	2200	40,000	97	Yes
MAS LED MR16 ExpertColor 7.2-50W 930 24D	12	7.2	50	GU5.3	480	24	3000	2400	40,000	97	Yes
MAS LED MR16 ExpertColor 7.2-50W 940 24D	12	7.2	50	GU5.3	480	24	4000	2400	40,000	97	Yes
MAS LED MR16 ExpertColor 7.2-50W 927 36D	12	7.2	50	GU5.3	450	36	2700	1350	40,000	97	Yes
MAS LED MR16 ExpertColor 7.2-50W 930 36D	12	7.2	50	GU5.3	480	36	3000	1450	40,000	97	Yes
MAS LED MR16 ExpertColor 7.2-50W 940 36D	12	7.2	50	GU5.3	480	36	4000	1450	40,000	97	Yes

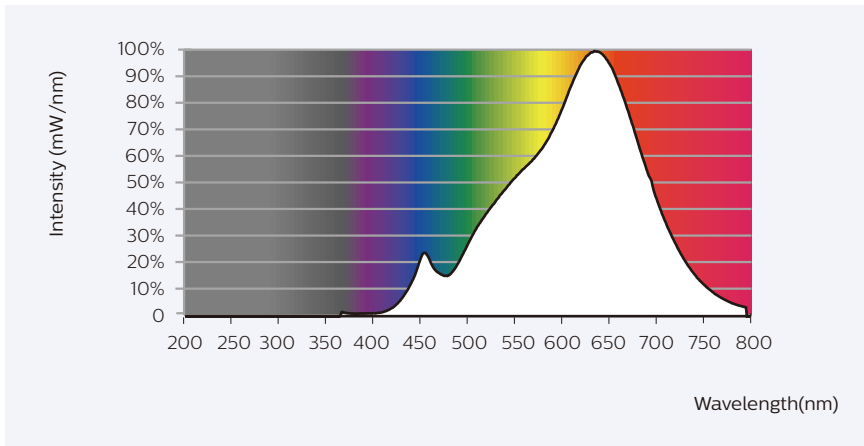
## Fixture Compatibility

Type	C max. Overall Length (mm)	D max. Diameter (mm)	max. Weight (gram)
MAS LED MR16 ExpertColor 7.2-50W	46	51	60

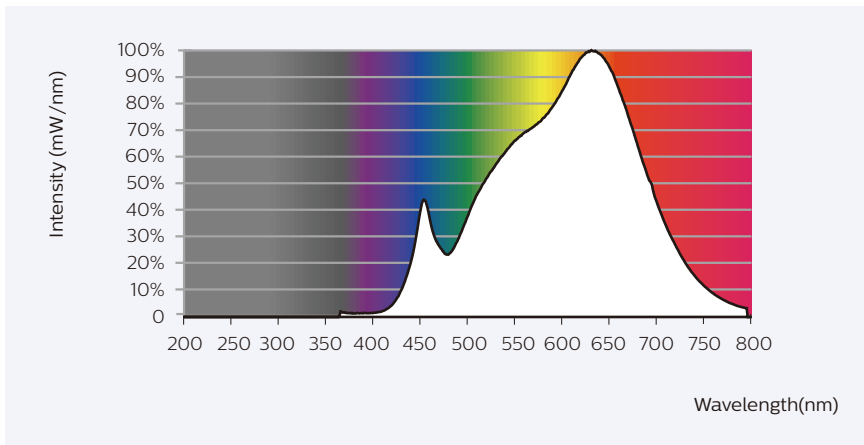


## Spectral Power Distribution

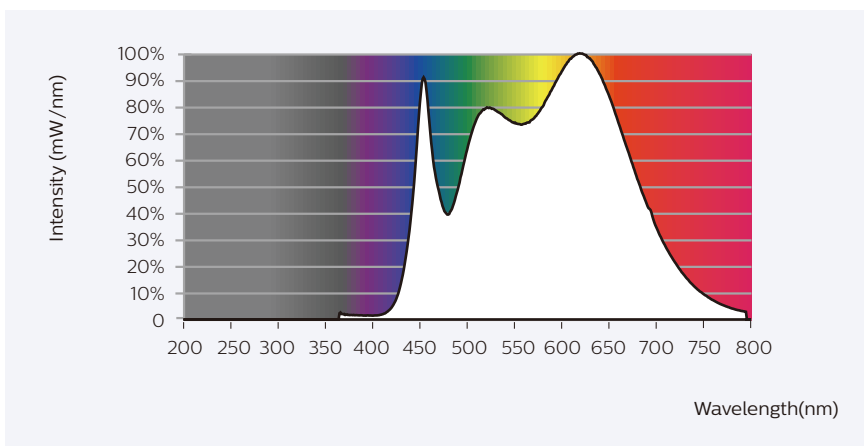
Spectrum ExpertColor LED MR16 7.2W 2700K



Spectrum ExpertColor LED MR16 7.2W 3000K



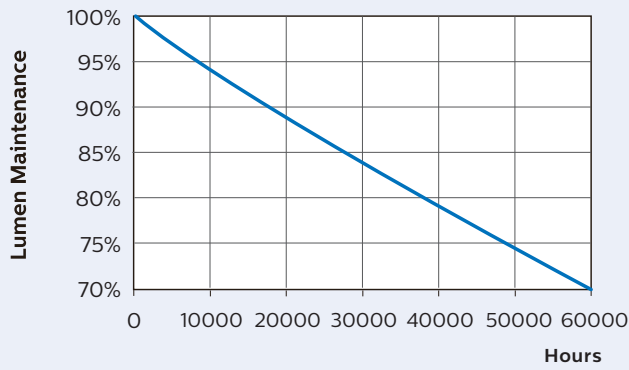
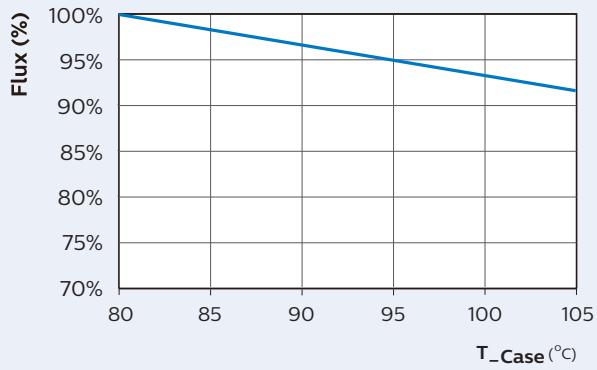
Spectrum ExpertColor LED MR16 7.2W 4000K



## Temperature

PHILIPS 12V MASTER LED MR16 ExpertColor 7.2-50W is designed for operation in all GU5.3 lighting installations in open fixtures, 10mm free air space is needed around the lamp housing to ensure long-life.

### MASTER LED ExpertColor MR16 7.2W



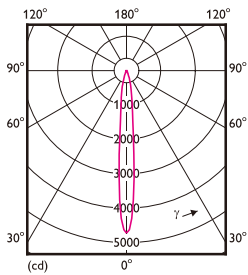
# Photometric Diagrams

## MAS LED MR16 ExpertColor 7.2-50W 2700K 10D

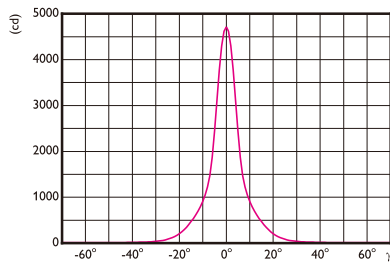
450 lm

Light output ratio	1.00	VBA	$2 \times 10^\circ$	$l_{max}$	4717 cd
Service upward	0.00	BS ( $1/2 I_{max}$ )	$2 \times 6^\circ$	K1	
Service downward	1.00	VBA ( $1/2 E_0$ )	$2 \times 6^\circ$		

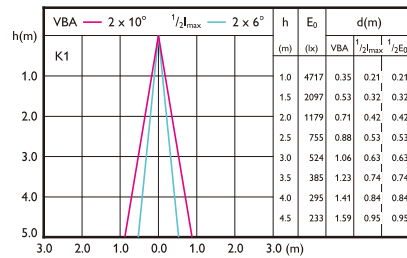
Polar intensity diagram



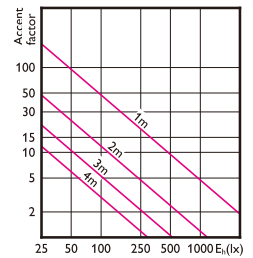
Cartesian intensity diagram



Beam diagram



Visual impact diagram

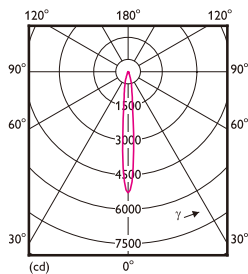


## MAS LED MR16 ExpertColor 7.2-50W 3000K 10D

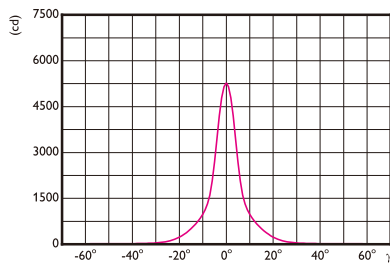
480 lm

Light output ratio	1.00	VBA	$2 \times 10^\circ$	$l_{max}$	5278 cd
Service upward	0.00	BS ( $1/2 I_{max}$ )	$2 \times 6^\circ$	K1	
Service downward	1.00	VBA ( $1/2 E_0$ )	$2 \times 6^\circ$		

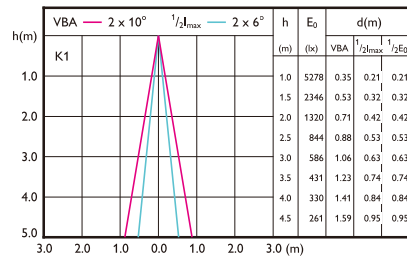
Polar intensity diagram



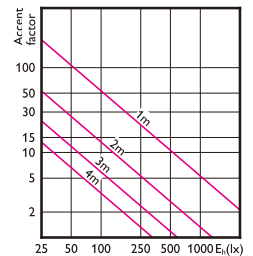
Cartesian intensity diagram



Beam diagram



Visual impact diagram

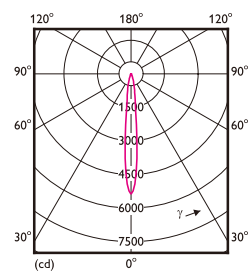


## MAS LED MR16 ExpertColor 7.2-50W 4000K 10D

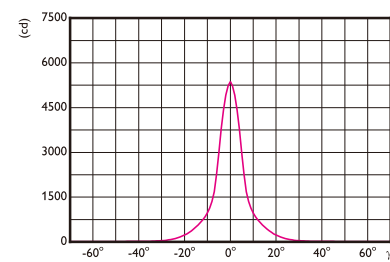
480 lm

Light output ratio	1.00	VBA	$2 \times 10^\circ$	$l_{max}$	5370 cd
Service upward	0.00	BS ( $1/2 I_{max}$ )	$2 \times 6^\circ$	K1	
Service downward	1.00	VBA ( $1/2 E_0$ )	$2 \times 6^\circ$		

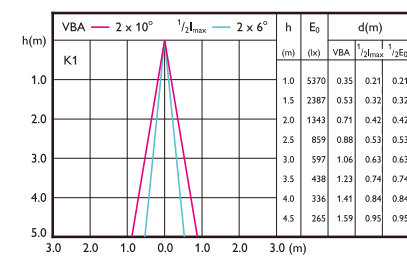
Polar intensity diagram



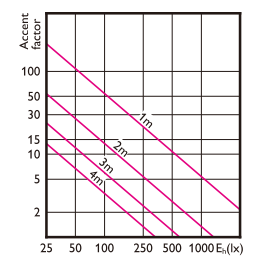
Cartesian intensity diagram



Beam diagram



Visual impact diagram

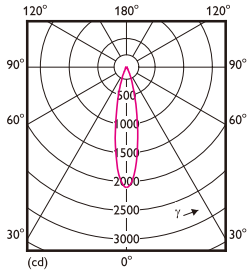


MAS LED MR16 ExpertColor 7.2-50W 2700K 24D

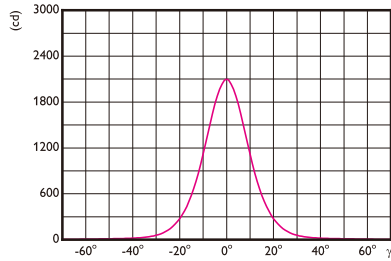
450 lm

Light output ratio	1.00	VBA	$2 \times 24^\circ$	$l_{max}$	2099 cd
Service upward	0.00	BS ( $\frac{1}{2} l_{max}$ )	$2 \times 11^\circ$	K1	
Service downward	1.00	VBA ( $\frac{1}{2} E_0$ )	$2 \times 11^\circ$		

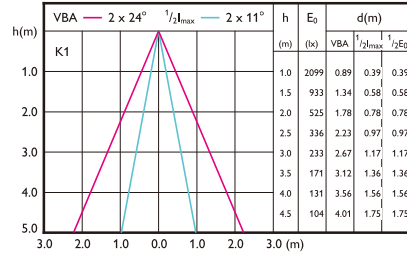
Polar intensity diagram



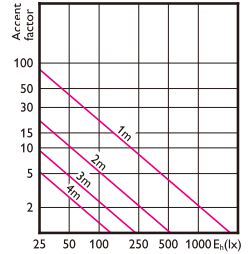
Cartesian intensity diagram



Beam diagram



Visual impact diagram

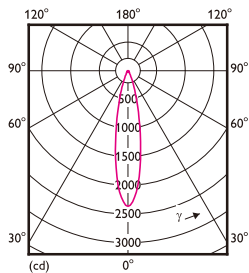


MAS LED MR16 ExpertColor 7.2-50W 3000K 24D

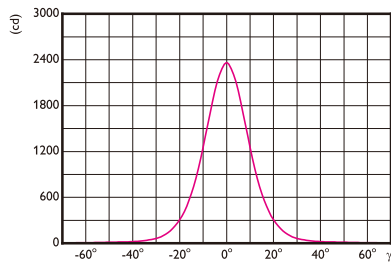
480 lm

Light output ratio	1.00	VBA	$2 \times 41^\circ$	$l_{max}$	2364 cd
Service upward	0.00	BS ( $\frac{1}{2} l_{max}$ )	$2 \times 11^\circ$	K1	
Service downward	1.00	VBA ( $\frac{1}{2} E_0$ )	$2 \times 11^\circ$		

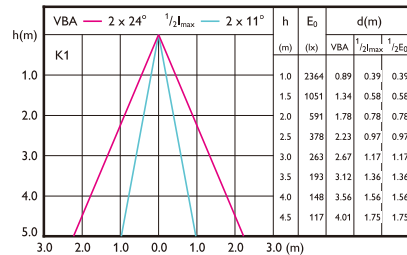
Polar intensity diagram



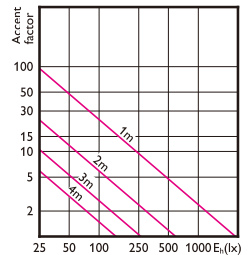
Cartesian intensity diagram



Beam diagram



Visual impact diagram

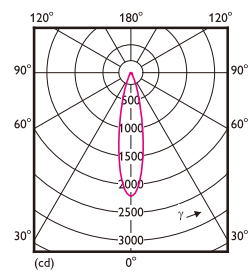


MAS LED MR16 ExpertColor 7.2-50W 4000K 24D

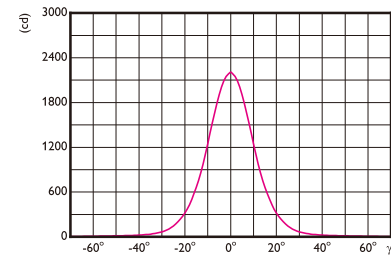
480 lm

Light output ratio	1.00	VBA	$2 \times 24^\circ$	$l_{max}$	2210 cd
Service upward	0.00	BS ( $\frac{1}{2} l_{max}$ )	$2 \times 12^\circ$	K1	
Service downward	1.00	VBA ( $\frac{1}{2} E_0$ )	$2 \times 11^\circ$		

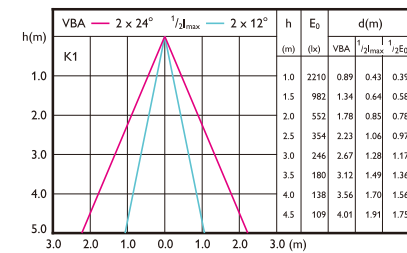
Polar intensity diagram



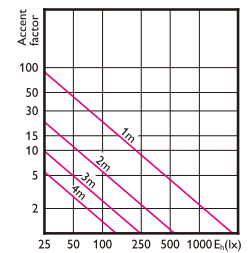
Cartesian intensity diagram



Beam diagram



Visual impact diagram

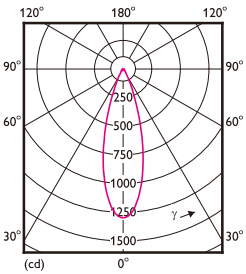


**MAS LED MR16 ExpertColor 7.2-50W 2700K 36D**

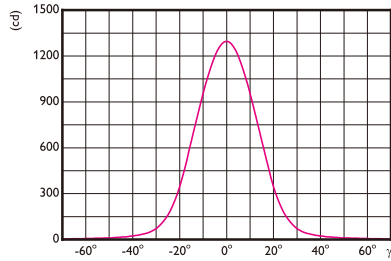
**450 lm**

Light output ratio	1.00	VBA	$2 \times 36^\circ$	$I_{max}$	1296 cd
Service upward	0.00	BS ( $1/2 I_{max}$ )	$2 \times 15^\circ$	K1	
Service downward	1.00	VBA ( $1/2 E$ )	$2 \times 14^\circ$		

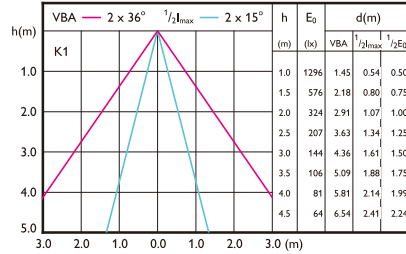
**Polar intensity diagram**



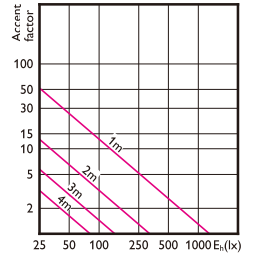
**Cartesian intensity diagram**



**Beam diagram**



**Visual impact diagram**

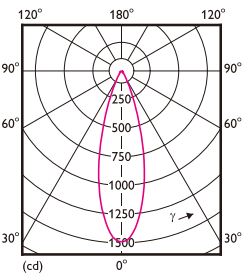


**MAS LED MR16 ExpertColor 7.2-50W 3000K 36D**

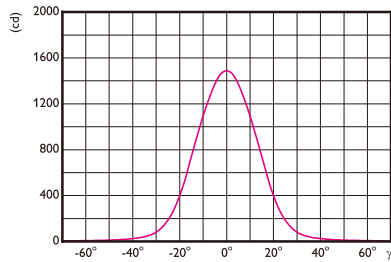
**480 lm**

Light output ratio	1.00	VBA	$2 \times 36^\circ$	$I_{max}$	1489 cd
Service upward	0.00	BS ( $1/2 I_{max}$ )	$2 \times 15^\circ$	K1	
Service downward	1.00	VBA ( $1/2 E_0$ )	$2 \times 14^\circ$		

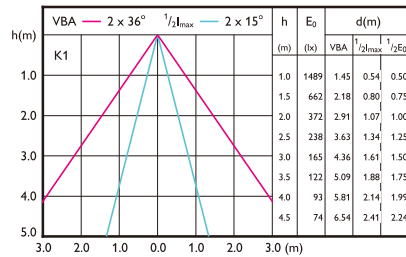
**Polar intensity diagram**



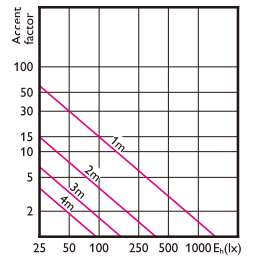
**Cartesian intensity diagram**



**Beam diagram**



**Visual impact diagram**

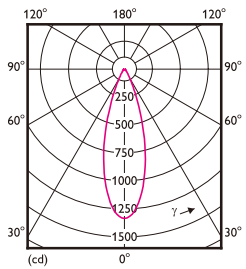


**MAS LED MR16 ExpertColor 7.2-50W 4000K 36D**

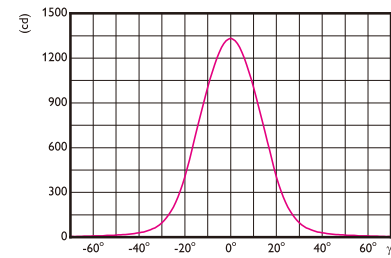
**480 lm**

Light output ratio	1.00	VBA	$2 \times 36^\circ$	$I_{max}$	1333 cd
Service upward	0.00	BS ( $1/2 I_{max}$ )	$2 \times 16^\circ$	K1	
Service downward	1.00	VBA ( $1/2 E_0$ )	$2 \times 15^\circ$		

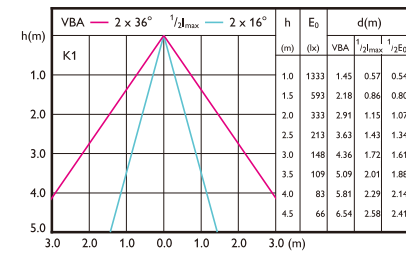
**Polar intensity diagram**



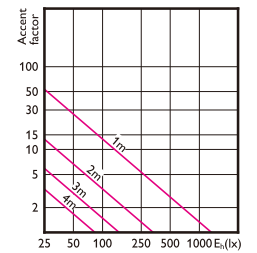
**Cartesian intensity diagram**



**Beam diagram**

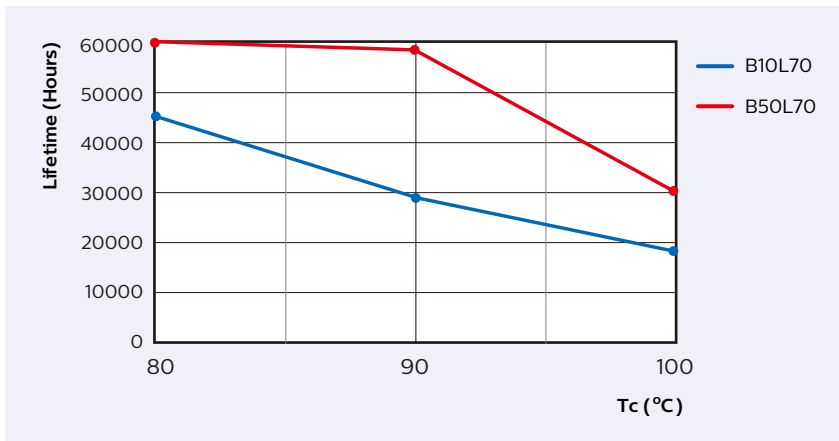
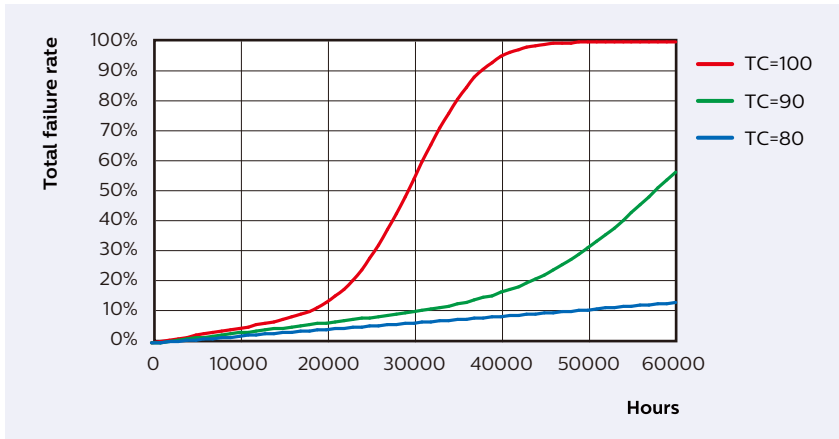


**Visual impact diagram**





Failure Rate Curve of MAS LED MR16 ExpertColor



- PHILIPS 12V MASTER LED ExpertColor MR16 lamp has a lifetime of 40,000 hours, defined as the number of hours when 50% of a large group of identical lamps below 70% of its initial lumens.
- Lifetime estimation based on the application environment condition: at room temperature (25°C@ 10mm free air), base down burning position, and at rated voltage.

## Installation guide

PHILIPS 12V MASTER LED ExpertColor 7.2W MR16 lamp has a unique, patented, electronic solution that makes this LED Replacement lamp compatible with the broadest possible range of standard 12VAC Halogen electronic transformers in the global market place except for some IC-base transformers WHEN the whole system is without dimmers. Compatibility with electromagnetic transformers is guaranteed as well. To determine the maximum number of these LED MR16 lamps to be connected to a standard halogen transformer, is by simply dividing **40%** of the rated power of the transformer by LED lamp wattage.

Thus, a 60W Halogen transformer will hold Master Premium LED ExpertColor 7.2W up to INT  $(60 \times 40\% / 7.2) = 3$  lamps.

1. Determine the max. number of lamps can be connected to a ET, 40% power derating of ET should be considered
2. For dimming system, you can install for each dimmer

Example:

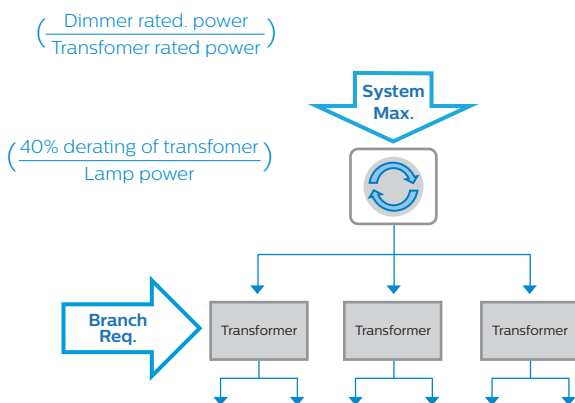
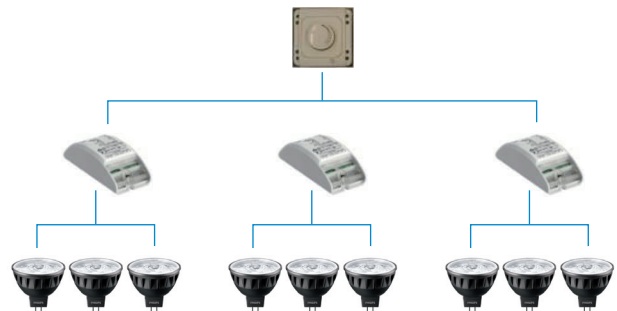
1.  $W$  (or VA) \*40% of ET to determine max. lamps per transformer



Transformer: Light Tech LET60  
 Pout: 60W max  
 $60W \times 40\% / 7.2W \sim 3$   
 3 x 7.2W lamps max. per transformer

2. The rated power of the dimmer and the transformer is to determine the max. numbers of the transformers per dimmer

Max. number of transformers:  
 $200W / 60W = 3.33 \rightarrow 3$  transformer per dimmer



# Transformer/Dimmer compatibility list

			Transformer																			
			Philips				OSRAM					Tridonic			LONON	NVC	Panasonic	Koizumi	ENDO	Daiko		
			ET-E60	ET-E30 LED	ET-S60	ET-E105	ET-C60	ET-P60	Redback 60VA	HTM 70	HTM 105	HTM 150	VIPER	Speedy	POSSUM	LNDET -50	ET60E	HNK 00844	AEE 690157	X224B	DP 36283	
			Without Dimmer	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	
Brand	Model	Stock																				
Dimmer	Clipsal	32E450UDM	2																			
		32E450TM	5																			
		32E2CFLDM	2																			
		250Volt 500VA	1																			
		KB31RD400	3																			
	HPM	Cat 400L	4																			
		Cat 400T	5																			
	Philips	LRD8020	2																			
	TCL	V8051	1																			
		A8051	1																			
	TNC	Z62-M12	0																			
	PDL	624TMWH	5																			
	KIWI	K004U	2																			
		K005T	2																			
	ANAM	D700	2																			
	Schneider	3031H360M	3																			
		E3031HD	5																			
		559	0																			
	Panasonic	WEG57816	2																			
		WEG57813	2																			
WEC57518		2																				
WMS 549		2																				
NQ20203T		2																				
WN575211K		5																				
Koizumi	AEE690180	2																				
	X-220W	2																				

NR



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