

MEGAMAN[®]

LED

Reflector

Series

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Section 1

Introduction

Flipping the page to a new era in energy-saving lighting

MEGAMAN[®] LED Reflector Series

The MEGAMAN[®] LED Reflector series have been developed to offer an energy-saving solution for areas that require narrow beam or spot illumination to augment display items or to create contrast in a selected area. However, unlike competing offerings, the MEGAMAN[®] LEDs offer unique edges that make them the better choice.

Unique Edges

- 1. Perfectly Replaces Halogen Reflector Lamps**
The MEGAMAN[®] LED Reflector series is designed as direct retrofits of halogen reflector lamps. This translates to ease of installation into virtually any luminaire because the sizes and shapes of the MEGAMAN[®] LED reflectors resemble that of the halogens. Moreover, these lamps are engineered with conventional lamp bases in E14, E27, GU10 for direct installation into conventional GU10 or screw base lamp holders.
- 2. High Wattage Integral LED Lamps**
MEGAMAN[®] is currently the only producer of 15W LED lamps equipped with an integral driver to replace conventional AR111 and PAR30 halogen lamps.
- 3. High Lumen Intensity and Lumen Efficacy**
Thanks to the multi-die technology, excellent thermal management and with advanced reflector technology, the MEGAMAN[®] LED Reflector lamps are able to emit an average of 30% more lumen intensity than other LED brands, and virtually parallels halogen reflector lamps. The overall result is lower power consumption whilst producing higher lumens (i.e. higher lumen per watt at approximately 35lm/W).
- 4. Mimimized Colour Shift**
Thanks to excellent thermal management, the colour shift of these lamps is reduced to only +/-100K. whereas, the colour shift of +/- 400K is evident on other LED brands. This translates to better colour temperature control and enhanced light colour consistency with the MEGAMAN[®] LED lamps.

5. Higher Colour Rendering (CRI)
The MEGAMAN[®] LED Reflector lamps are able to produce higher colour rendering reaching Ra85 (for 2800K) or Ra93 (for 4000K). Other LED lamps from other brands are only able to produce an average CRI of Ra60 to 75.
6. More Lighter in Weight*
When compared with other LED brands, the MEGAMAN[®] LED reflector lamps are, in general, 20% lighter in weight. This helps reduce the dead load on areas of installation.
**Comparison based on 7W LED lamps only.*
7. Incredible Energy Savings
Enjoy up to 80% of energy savings when compared with halogen reflector lamps, and further savings in air-conditioning costs.
8. Faster Return on Investments
When compared with conventional reflector lamps, the MEGAMAN[®] LED Reflector series guarantees short payback period in less than 14 months when used 24 hours per day.

Product Features

1. Long Lamp Life
Equipped with 20,000 hours of lamp life, these lamps are able to last an average of 6 to 10 times longer than halogen reflector lamps.
2. Narrow Beam Illumination
Thanks to advanced reflector designs, these LED reflectors are able to produce a narrow beam angle of 24, 30 and 35 degrees. Spot illumination with a beam angle of 10 degrees is also achievable.
3. Options of Illumination Colours.
The MEGAMAN[®] LED Reflector series is available in 2800K, 4000K or any light colour catered for various lighting needs.
4. Generates Less Heat
The MEGAMAN[®] LED Reflector lamps are designed to generate illumination with less heat which is almost half the heat emitted by halogens reflector lamps.
5. Generates Negligible UV and IR
These lamps also generate negligible amounts of UV and IR radiation that is far below IEC standards. All this helps prevent damages to illuminated products and causes minimal risk to the human body. Energy cost in air-conditioning is subsequently reduced.

Section 2 Applications

The MEGAMAN[®] LED Reflector series can be used to highlight a certain area or object. These include:

- Boutiques / Shops (window displays, shop displays)
- Shopping Malls (signages)
- Hotels (corridors, reception desks, elevators)
- Restaurants
- Lounges (bar area)
- Museums
- Art Galleries
- Offices (conference rooms, reception desks)



Section 3 Specifications



Series	LED PAR16	LED PAR16	LED PAR20
Model No.	LR0407	LR0407	LR0308
Wattage (W)	7	7	8
Lamp Base	E14	GU10	E27
Lamp Life (hrs)	20000	20000	20000
Min. Lumen Intensity (lx)	600	600	1000
Beam Angle (°)	35	35	30
Operating Temperature (°C)	-10 to +40	-10 to +40	-10 to +40
Diameter (mm)	50	50	65
Length (mm)	89	76	95
Weight (g)	94	83	136



Series	LED PAR30	LED AR111
Model No.	LR0215	LR0115
Wattage (W)	15	15
Lamp Base	E27	GU10
Lamp Life (hrs)	20000	20000
Min. Lumen Intensity (lx)	2800	2800
Beam Angle (°)	24	24
Operating Temperature	-10 to +40	-10 to +40
Diameter (mm)	95	111
Length (mm)	102	93
Weight (g)	232	236

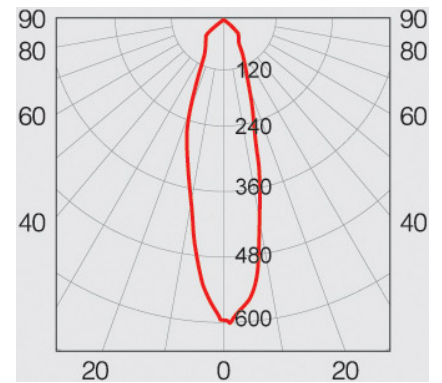
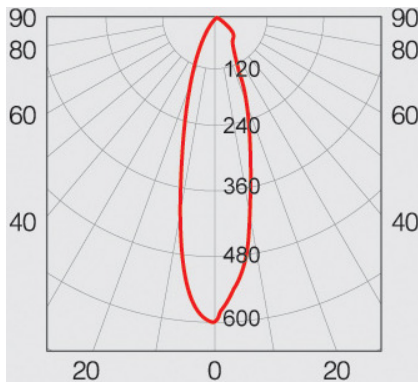
*All measurements of lumen intensity and beam angle are based on colour temperature of 2800K

**All data are preliminary only and subject to changes.

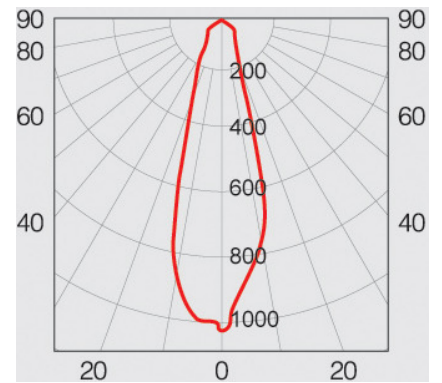
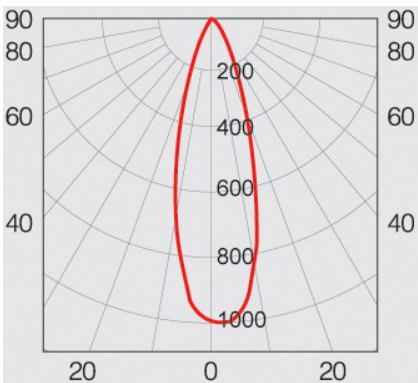
Section 4 Lumen Intensity Comparisons

The MEGAMAN[®] LED Reflector series are designed to parallel conventional halogens and incandescent reflector lamps in terms of profile and performance, but with higher energy savings and better light quality.

MEGAMAN[®] LED PAR16 (Model no. LR0407)



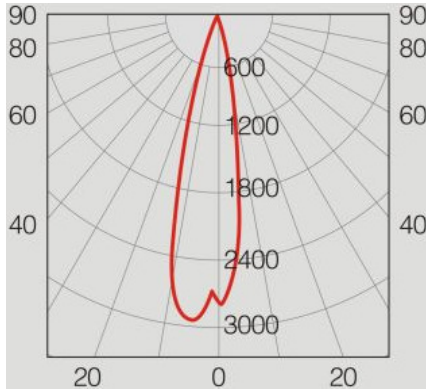
MEGAMAN[®] LED PAR20 (Model no. LR0308)



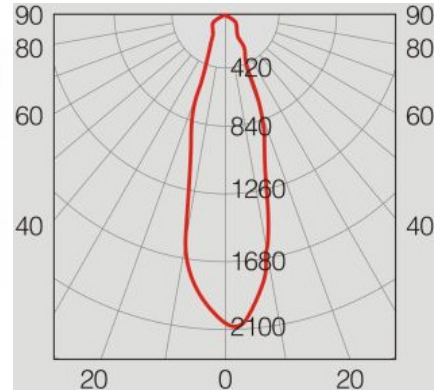
MEGAMAN[®] LED PAR30 (Model no. LR0215)



MEGAMAN[®] PAR30
15W/E27



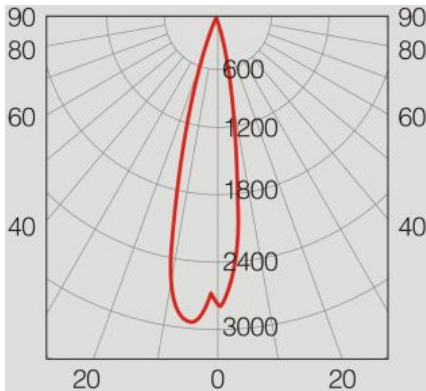
Halogen PAR30
75W/E27



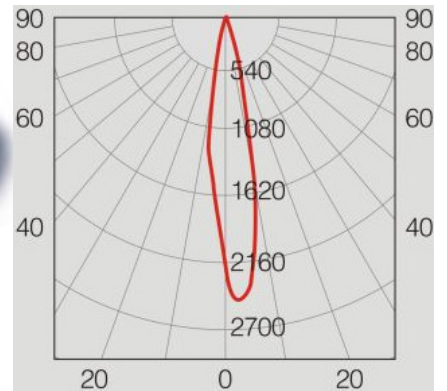
MEGAMAN[®] LED AR111 (Model no. LR0115)



MEGAMAN[®] AR111
15W/E27



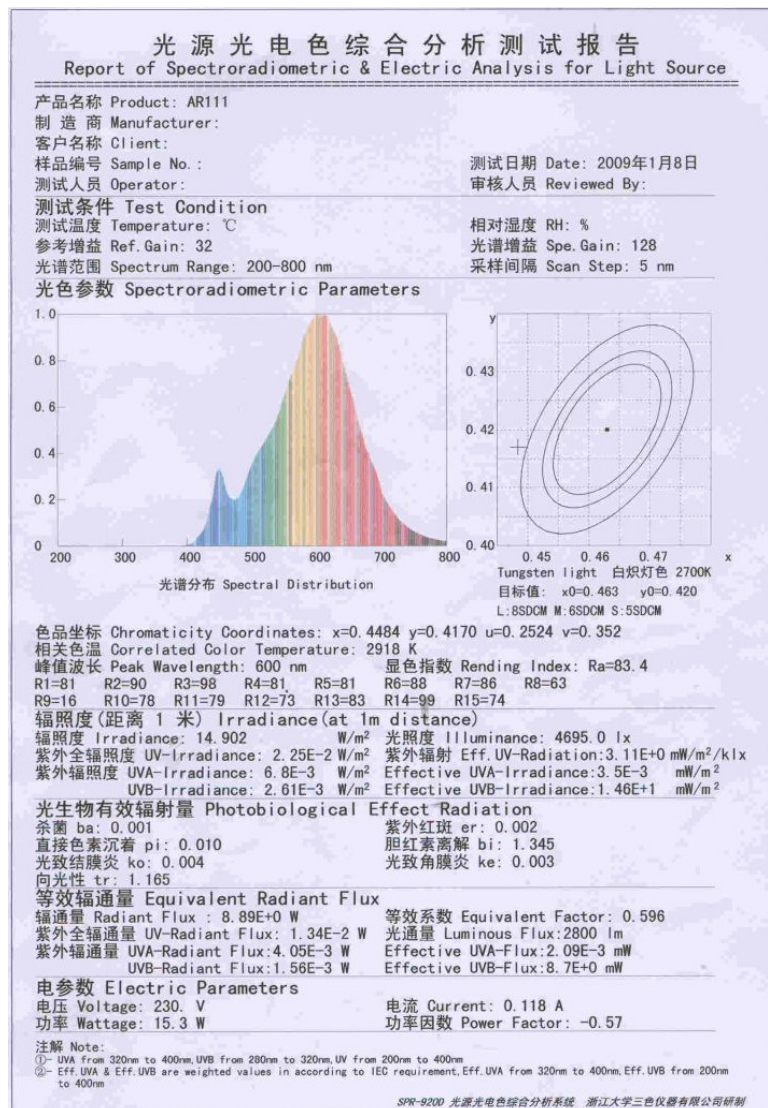
Halogen Ø111
35W/GU5.3



Section 5 UV-Irradiance Results

The MEGAMAN[®] LED Reflector series produces negligible amounts of UV that is far below IEC standards and presents minimal risk towards the human body.

Test Results for LR0115



	UVA	UVB
LR0115	3.5E-3 mW/m ² (Exempt)	1.46E+1 mW/m ² (Low risk)
IEC Standard	0.001 W/m ²	0.003 W/m ²

Section 6

Total Cost of Ownership

The MEGAMAN® LED Reflectors series is designed to reduce costs related to relamping, maintenance and energy. The total cost of ownership (TCO) is significantly lower when compared with halogen reflector lamps.

Example 1:

	7W MEGAMAN® LED PAR16	35W HALOGEN PAR16
Estimated Retail Price (max.)	US\$65	US\$7 x 10 lamps = US\$70
Maintenance Cost after 20,000hrs	-	Relamping at 9 times x \$10/lamp = \$90
Electricity Cost after 20,000hrs	7W x 20,000 x 0.2/1,000 = US\$28	35W x 20,000 x 0.2/1,000 = US\$140
Total Cost of Ownership	US\$93	US\$300
Breakeven	4609 hours	

Example 2:

	MEGAMAN® AR111 15W	HALOGEN ø111 35W + Transformer (4W)	MEGAMAN® PAR30 15W	HALOGEN PAR30 75W	MEGAMAN® PAR20 8W	HALOGEN PAR20 50W	MEGAMAN® PAR16 7W	HALOGEN PAR16 35W
Wattage (W)	15	39	15	75	8	50	7	35
Lamp life (hour)	20000	3000	20000	2000	20000	2000	20000	2000
Estimated retail price at 0 hour (US\$)	130.00	9.00 19.20	130.00	7.00	78.00	6.50	65.00	7.00
Estimated retail price at 20,000 hours (US\$)		54.00		63.00		58.50		63.00
Material Cost	130.00	82.20	130.00	70.00	78.00	65.00	65.00	70.00
0 hour initial cost								
20,000 hours cost		60.00		90.00		90.00		90.00
Labour Cost	0.00	60.00	0.00	90.00	0.00	90.00	0.00	90.00
Electricity @20000 hrs (kWh)	300	780	300	1500	160	1000	140	700
Electricity Cost @20000 hrs Assuming unit cost of kWh is \$0.2	60.00	156.00	60.00	300.00	32.00	200.00	28.00	140.00
Total Cost of Ownership	US\$190.00	US\$298.20	US\$190.00	US\$460.00	US\$110.00	US\$355.00	US\$93.00	US\$300.00
Saving	US\$108.20		US\$270.00		US\$245.00		US\$207.00	
Breakeven Point (hour)		9952.10		6341.46		4684.68		4609.93

Breakeven Point

Using the MEGAMAN[®] LED Reflector lamps guarantee fast payback periods within 14 months.

Assumption: Let "h" be the hour which is the time of breakeven point for halogens and LEDs via the use of algebra.

For MEGAMAN[®] LED PAR16

$$65 + 0.2h(7/1000) = 7(h/2000) + 10(h/2000) + 0.2h(35/1000)$$
$$h = 4609 \text{ hours (6 months)}$$

For MEGAMAN[®] LED PAR20

$$78 + 0.2h(8/1000) = 6.5(h/2000) + 10(h/2000) + 0.2h(50/1000)$$
$$h = 4684 \text{ hours (6.5 months)}$$

For MEGAMAN[®] LED PAR30

$$130 + 0.2h(15/1000) = 7(h/2000) + 10(h/2000) + 0.2h(75/1000)$$
$$h = 6341 \text{ hours (9 months)}$$

For MEGAMAN[®] LED AR111

$$130 + 0.2h(15/1000) = 19.2 + \{(9)(h/3000) + 10(h/3000) + 0.2h(39/1000)\}$$
$$h = 9952 \text{ hours (14 months)}$$

**All the above figures are for reference only.*

Section 7

CFL Vs. LED Lamps: Visibility & Feasibility

The MEGAMAN[®] LED Reflectors series is designed to compensate areas that cannot be satisfied with the CFL reflectors. In general, the wide beam angle of the CFL reflectors would be most suitable for general lighting. The LED reflectors, on the other hand, would be ideal for creating accent lighting.

Purposes of MEGAMAN[®] Energy Saving Reflector Range (ESR)

- CFL ESR: replace E- / F- / G- class halogen lamps for general household illumination.
- LED ESR: replaces halogen and incandescent reflector lamps for accent lighting.

CFL ESR	LED ESR
For Ambient Lighting → Wider beam angle	For Accent Lighting → Narrow spot angle



Section 8

Future of MEGAMAN[®] LEDs

Owing to the increasing popularity of LEDs, MEGAMAN[®] has devised plans to open newer grounds for its LED range with a variety of functions to enhance its ability of fully replacing traditional directional light sources. These include:

- Upgrading the LED AR111 to higher wattage to replace Ceramic Metal Halides in 20watt.
- Developing external drivers for the PAR16, GU10 and AR111 models to reduce its size. This would allow the lamps to fit into luminaires of smaller profiles.
- Developing dimmable LEDs in the next phase to cater areas that require the creation of mood lighting effects. External drivers will be developed to achieve this.
- Developing the ultra-slim LED GX53 lamps for space-demanding applications.