



DATA SHEET

# SōL™ SERIES

LED LAMPS

TABLE OF CONTENTS

INTRODUCTION: SōL™ MR16 SERIES LED LAMPS .....3

TECHNICAL SPECIFICATIONS .....4

TYPICAL ILLUMINANCE .....4

RELATIVE LUMINOUS INTENSITY - WHITE .....5

RELATIVE POLAR INTENSITY - WHITE.....5

MECHANICAL DIMENSIONS .....5

TRANSFORMER DRAWINGS .....6

OVERLAY DRAWING .....6

FIXTURE COMPATIBILITY.....7

TRANSFORMER DRAWING.....7

TRANSFORMER COMPATIBILITY LIST .....8

WARRANTY STATEMENT.....9

# SōL™ SERIES LED LAMPS

The design of the Lamina SōL™ MR16 GU 5.3 / GX 5.3 LED integrates a high power LED light source, a finely-tuned optical lens and high-performance thermal heat sink shell in a traditional halogen form-factor. This replacement lamp provides the quantity and quality of light produced by traditional incandescent and halogen lamps.

The Lamina SōL MR16 LED is ideal for myriad applications including track lighting, general architectural and landscape lighting, display case fixtures and cabinet lighting, plus industrial OEM equipment lighting.

All Lamina LED light sources are manufactured by combining high brightness LEDs with our innovative and proprietary packaging technology. This technology is a breakthrough in thermal performance for LED packaging, a key factor in determining LED life, reliability and luminosity.

Unmatched thermal performance coupled with package interconnectivity allows us to densely cluster multiple LEDs to achieve exceptionally high luminous intensity in very small footprints.

We're changing the way you think about designing with LEDs.

## Features:

- Long-life greater than 50,000 hours
- Designed as a direct retrofit into most MR16 Fixtures
- High CRI 80+
- Dimmable
- Cool beam - no UV or IR
- \$60.00 in energy savings at 50,000 hours\*
- \$225 savings in replacement costs\*
- \$125 savings in replacement lamp savings\*
- RoHS compliant

\*12.6 Watt savings, \$0.10kwh rate. Annual operating hours = 3,650. \$5.00 replacement cost for MR16CC/CVG at 2,000 hour life.

Additionally, Lamina provides unmatched product integration support. Our experienced Sales Application Engineers, knowledgeable in LED design integration, optics, thermal management, and electronics are just a phone call away. To request a sample or to speak with a Sales Application Engineer, call us at 800-808-5822 or +1 609-265-1401.



INTRODUCTION

## APPLICATIONS



# SPECIFICATIONS @ 25° C AMBIENT

Table 1 \*Preliminary Data


Part Number	Color	Color Temp. TYP (°K)	CRI TYP / MIN	Input Voltage	Power Consumption Typical (W)	Beam Type	Beam Angle	Luminous Flux (lm) TYP / MIN	CBCP	Wavelength (nm) MIN / MAX
RL-16D2-0496	Warm White	3050	58 / 48	12VAC/DC	7.4	Narrow	38°	200 / 175	—	—
RL-16D2-E0540	Warm White	3050	58 / 48	12VAC/9VDC	8.0	Narrow	38°	245 / 213	391	—
RL-16D0-0460	Daylight White	4700	66 / 60	12VAC/DC	7.4	Narrow	32°	200 / 170	—	—
RL-16D0-E0538	Daylight White	4700	66 / 60	12VAC/9VDC	8.0	Narrow	32°	235 / 204	563	—
RL-16D1-0518	TruColor	3050	81 / 74	12VAC/DC	7.4	Wide	57°	120 / 104	—	—
RL-16D1-E0539	TruColor	3050	81 / 74	12VAC/9VDC	8.0	Wide	57°	129 / 112	132	—
RL-16A0-0524	Red	621 / 631 nm	—	12VAC/DC	6.6	Wide	35°	125 / 93	—	621/ 631
RL-16E0-0527	Amber	584 / 596 nm	—	12VAC/DC	7.4	Wide	35°	72 / TBD	—	584 / 596
RL-16B1-0525	Blue	460 / 470 nm	—	12VAC/DC	7.4	Wide	34°	53 / 42	—	460 / 470
RL-16C1-0526	Green	515 / 535 nm	—	12VAC/DC	7.4	Wide	37°	192 / 154	—	515 / 535

<sup>1</sup>Values given are for specified drive current at 40°C (maximum operating temperature, in 25°C free air: 68°C).


## TYPICAL ILLUMINANCE

Table 2

		Warm White (RL-16D2-0496)				Daylight White (RL-16D0-0460)				TruColor (RL-16D1-0518)			
		NARROW FLOOD BEAM ANGLE 38°				NARROW FLOOD BEAM ANGLE 32°				WIDE FLOOD BEAM ANGLE 57°			
Throw Distance	Throw Distance	Illuminance		Beam Width		Illuminance		Beam Width		Illuminance		Beam Width	
(m)	(ft)	(lux)	(fc)	(m)	(ft)	(lux)	(fc)	(m)	(ft)	(lux)	(fc)	(m)	(ft)
CBCP	1	400	37.2	0.6	2.0	404	37.5	0.4	1.3	164	15.2	0.8	2.6
	2	100	9.3	1.1	3.6	101	9.4	0.7	2.3	41	3.8	1.5	4.9
	3	44	4.1	1.7	5.6	45	4.2	1.1	3.6	18	1.7	2.3	7.5



		Warm White (RL-16D2-E0538)				Daylight White (RL-16D0-E0540)				TruColor (RL-16D1-E0539)			
		NARROW FLOOD BEAM ANGLE 38°				NARROW FLOOD BEAM ANGLE 32°				WIDE FLOOD BEAM ANGLE 57°			
Throw Distance	Throw Distance	Illuminance		Beam Width		Illuminance		Beam Width		Illuminance		Beam Width	
(m)	(ft)	(lux)	(fc)	(m)	(ft)	(lux)	(fc)	(m)	(ft)	(lux)	(fc)	(m)	(ft)
CBCP	1	487	40.6	0.6	2.0	443	41.2	0.4	1.3	179	16.6	0.8	2.6
	2	108	10.0	1.1	3.6	111	10.3	0.7	2.3	45	4.2	1.5	4.9
	3	48	4.5	1.7	5.6	49	4.6	1.1	3.6	20	1.9	2.3	7.5



# RELATIVE LUMINOUS INTENSITY

Daylight White (RL-16D0-0460 & RL-16D0-E0538), Warm White (RL-16D2-0496 & RL-16D2-E0540), and TruColor (RL-16D1-0518 & RL-16D1-E0539)

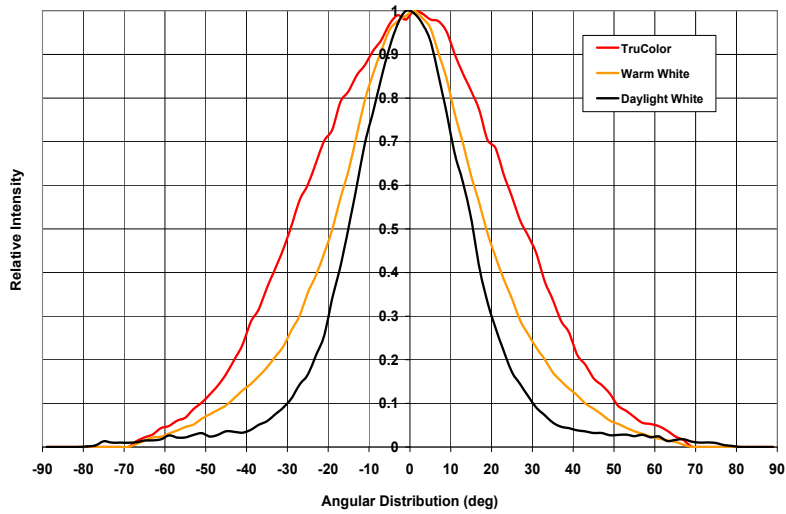
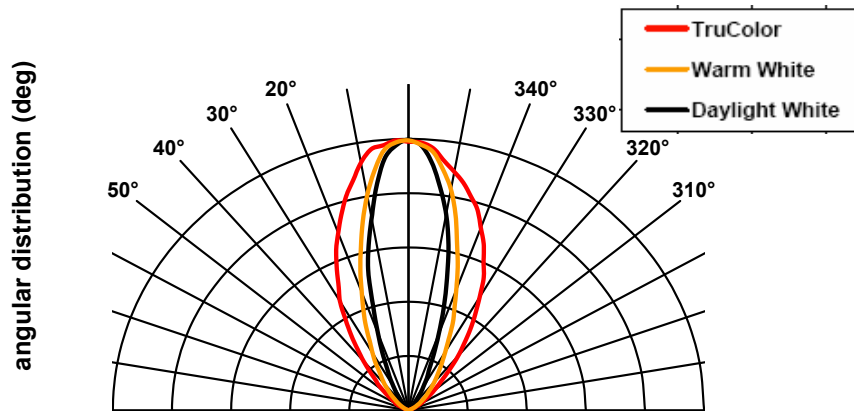


Figure 1

# RELATIVE LUMINOUS AND POLAR INTENSITY

Daylight White (RL-16D0-0460 & RL-16D0-E0538), Warm White (RL-16D2-0496 & RL-16D2-E0540), and TruColor (RL-16D1-0518 & RL-16D1-E0539)

Figure 2



# MECHANICAL DIMENSIONS

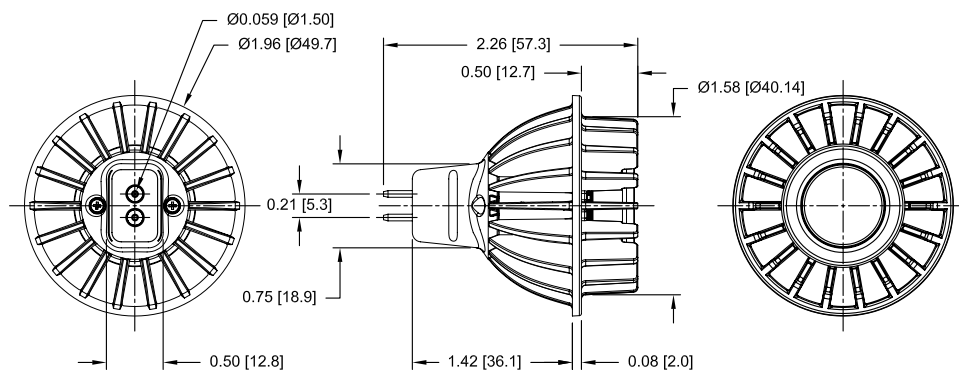


Figure 3

# OVERLAY OF A SōL MR16 GU5.3 GX5.3 LED WITH A TYPICAL HALOGEN MR16

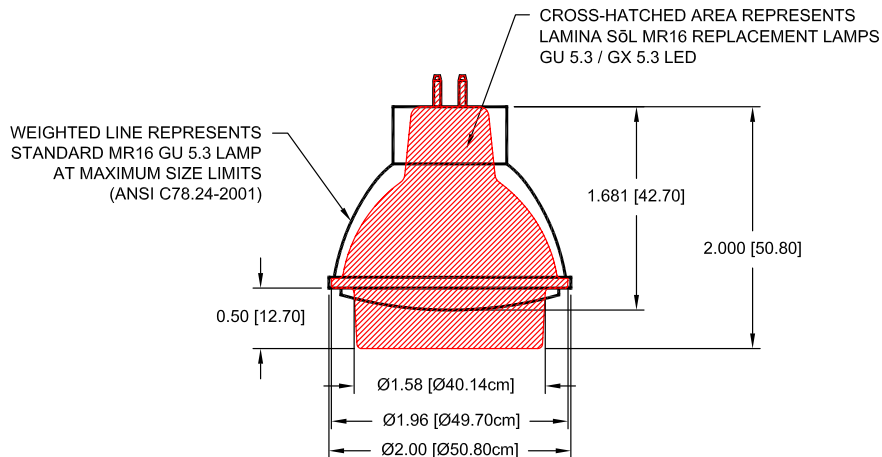


Figure 4

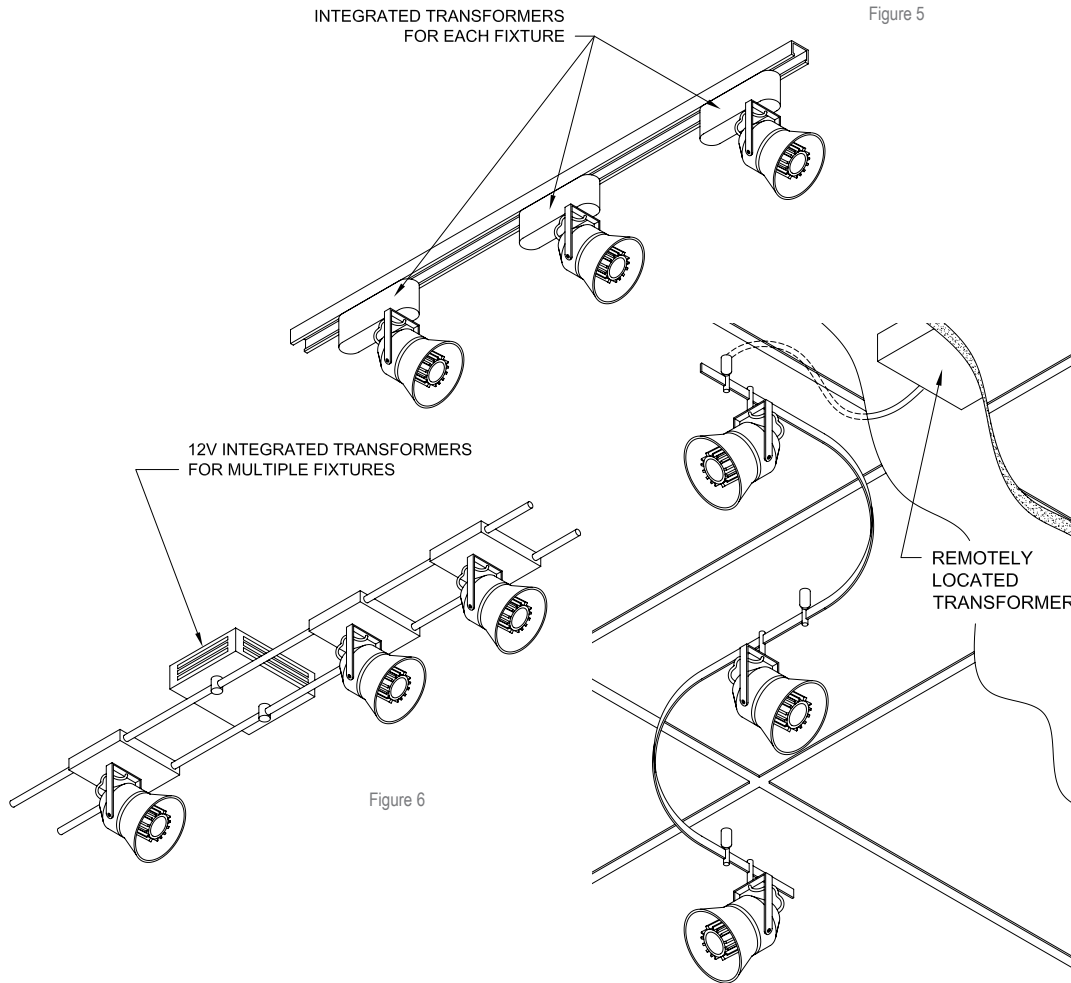
## FIXTURE COMPATIBILITY

The SōL MR16 GU 5.3 / GX 5.3 LED is not compatible with all MR16 lighting fixtures. To ensure that your fixture is compatible with the SōL MR16 GU 5.3 / GX 5.3 LED, adhere to the following guidelines:

- The SōL MR16 GU 5.3 / GX 5.3 LED requires adequate ventilation around the lamp housing (40°C maximum ambient) to ensure peak performance and lifetime expectancy;
- Is not recommended for use in sealed fixtures;
- Is not recommended for use with recessed fixtures or within small enclosures unless air exchange or cooling within the enclosed air space is provided;
- Is not designed for outdoor use or for use in wet environments;
- Is not compatible with all fixtures having integral electronic transformers, see fixture and transformer compatibility;
- May not fit all MR16 fixtures (verify fit prior to installation) and;
- An integral primary optic to focus the light. If the fixture includes a protective lens, remove it (if possible).

# TRANSFORMER DRAWINGS

Transformers can be integral to the fixture or remotely located, and can be used to power a group of fixtures, tracks, cables, or rails. (See Figure 5, Figure 6, and Figure 7)



## TRANSFORMER COMPATIBILITY

Two types of low-voltage transformers are used with traditional MR16 lamps: magnetic and electronic. Consider the following when selecting the appropriate transformer.

**Magnetic:** The SōL MR16 GU 5.3 / GX 5.3 LED is compatible with all types of magnetic transformers used with 12V lighting. Additionally, magnetic transformers have a lifetime equal to or longer than the SōL MR16, are more reliable than electronic transformers and can operate more efficiently than an electronic transformer if the output current rating used is approximate to the SōL MR16 load of 700 mA. However, magnetic transformers are heavier, and sometimes may hum (see chart below).

**Electronic:** The SōL MR16 GU 5.3 / GX 5.3 LED is not compatible with all electronic transformers due to its low power consumption of less than 8W. Some electronic transformers require a minimum load greater than 8W in order to work properly. This is especially true of lighting fixtures that have an integral transformer for each. Symptoms of incompatibility include: no light output, flickering, strobing, or random shutdown.

**Caution:** The SōL MR16 GU 5.3 / GX 5.3 can reach a temperature of 115°C before you see any flickering and that flickering is an indication that the SōL lamp is operating in a fixture with insufficient ventilation. The SōL MR16 must be used in fixtures that allow for the free flow of air around the lamp (40°C maximum ambient).

# TRANSFORMER COMPATIBILITY LIST

Rv. 031708

Figure 8

Transformer Part Number	Number of Units Required for Operation															Input Power VAC/Hz
	Operation					Dimmable					Audio Noise					
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	
OSRAM Halotronic HT-105/230 12L	O	O	O	O	O	U	U	U	U	U	O	O	O	O	O	230 / 60
Lightech LET60	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	120 / 60
Futura AET-H060-3	O	O	O	O	O	B	B	B	B	B	O	O	O	O	O	120 / 60
Wang WH-60IE2CA-2L	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	120 / 60
WAC Lighting EN1260-P-AR	O	O	O	O	O	BF	BF	B	O	O	X	O	O	O	O	120 / 60
LCI i60e	O	F	O	O	O	U	U	U	U	U	O	O	O	O	O	240 / 60
Hatch PS-12-20L	B	O	O	B	B	B	B	B	O	O	O	O	O	X	O	120 / 60
Lightech LVT60	O	O	O	O	O	F	F	O	O	O	O	O	O	O	O	122 / 60
Wang WH-601E2N	O	O	O	O	O	F	O	O	O	O	O	O	O	O	O	120 / 60
ALFA C-300-HV	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	120 / 60
Transformer Corp 420AS12075	O	O	E	E	E	O	O	E	E	E	O	O	E	E	E	120 / 60
Malibu ML300	O	O	O	O	O	U	U	U	U	U	O	O	O	O	O	120 / 60
Ardee Lighting A-1-701975	O	O	O	O	O	O	O	O	O	O	X	X	O	O	O	120 / 60
Ardee Lighting TW50	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	120 / 60
Ligro E12SC 50 SA	O	O	O	O	O	U	U	U	U	U	T	O	O	O	O	230 / 50
Ligro E12SC 20 SA	O	O	O	O	O	U	U	U	U	U	U	O	O	O	O	230 / 50
Malibu 600W	O	O	O	O	O	U	U	U	U	U	O	O	O	O	O	120 / 60

Transformer Part Number	Number of Units Required for Operation															Input Power VAC/Hz
	Operation					Dimmable					Audio Noise					
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	
OSRAM Halotronic HT 105/230 12 L (105 W)	X	O	O	O	O	X	O	O	O	O	O	O	O	O	O	230 VAC, 50 Hz
OSRAM Halotronic HTM 70/230-240 (70 W)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	230 VAC, 50 Hz
Lightech LET 60 (60W)	F	O	O	O	O	F	F	O	O	O	O	O	O	O	O	120 VAC, 60 Hz
Lightech LET 75-277-R	X	X	X	X	O						X	X	X	X	O	277 VAC, 60Hz
Hatch PS-12-20L (20W)	O	O	O	E	E	O	O	O	E	E	O	O	O	E	E	120 VAC, 60 Hz
Tridonic TE-NE 1070	X	O	O	O	O	X	O	O	O	O	O	O	O	O	O	230 VAC, 50 Hz
Tridonic Viper 22176072	X	O	O	O	O	X	O	O	O	O	O	O	O	O	O	230 VAC, 50 Hz
Ligro E12SC 50 SA (50W)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	230 VAC, 50 Hz
Ligro E12SC 20 SA (20W)	O	O	O	E	E	O	O	O	E	E	O	O	O	E	E	230 VAC, 50 Hz
Transformer Corp 420AS12075 (15W)	O	O	E	E	E	O	O	E	E	E	O	O	E	E	E	120 VAC, 60 Hz
Malibu 600W	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	120 VAC, 60 Hz
Wang WH-60IE2CA-2L	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	120 VAC, 60 Hz
WAC Lighting EN1260-P-AR	X	X	F	F	F	X	X	F	F	F	NA	NA	NA	NA	NA	120 VAC, 60 Hz
Wang WH-601E2N	X	F	O	O	F	X	X	X	O	F	NA	O	O	O	O	120 VAC, 60 Hz
ARDEE TW50	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	120 VAC, 60 Hz
Lightech LVT-60 (60W)	F	O	O	O	O	F	O	O	O	O	O	O	O	O	O	120 VAC, 60 Hz
Helms-Man HUA1200600X2L	F	O	O	O	O	F	O	O	O	O	O	O	O	O	O	120 VAC, 60 Hz
Tridonic Speedy TE50C101	X	X	X	O	O	X	X	X	X	X	NA	NA	NA	O	O	230 VAC, 50 Hz
Vadsbo DOS50 E5280770 (50W)	X	O	O	O	O	X	O	O	O	O	O	O	O	O	O	230 VAC, 50 Hz
Vadsbo DOS60 E5280771 (60 W)	X	X	O	O	O	X	X	O	O	O	NA	NA	O	O	O	230 VAC, 50 Hz
Vadsbo DOS70 E5280773 (70 W)	X	O	O	O	O	X	O	O	O	O	O	O	O	O	O	230 VAC, 50 Hz
LCI i60e	X	O	O	O	O	X	X	X	O	O	O	O	O	O	O	230 VAC, 50 Hz
Lightech LET 75-230V (75 W)	X	O	O	O	O	X	F	F	F	F	NA	O	O	O	O	230 VAC, 50 Hz
Lightech LET 75-120V (75 W)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	120 VAC, 60 Hz
Hatch VS12 60W (60 W)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	120 VAC, 60 Hz
Hatch VS12 60W (60 W)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	120 VAC, 60 Hz
Hampton Bay HB555-151	X					X					X					120 VAC, 60 Hz
Varilight EMC YT50 (50W)	O	O	O	O	O	F	F	O	O	O	O	O	O	O	O	230 VAC, 50 Hz
Varilight EMC YT105 (105 W)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	230 VAC, 50 Hz
Varilight EMC YT70 (70 W)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	230 VAC, 50 Hz
Varilight EMC YT250 (250 W)	F	F	F	F	F	F	F	F	F	F	O	O	O	O	O	230 VAC, 50 Hz
TCI Sarona WA 70	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	120 VAC, 50/ 60 Hz
Relco Micro 60 PFS RN1608	F	O	O	O	O	F	O	O	O	O	O	O	O	O	O	230 VAC, 50 Hz
ALFA C300HV (277 VAC)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	277 VAC, 60Hz

<span style="background-color: yellow; border: 1px solid black; padding: 2px;">O</span> Magnetic	<span style="background-color: lightgreen; border: 1px solid black; padding: 2px;">O</span> Passes	<span style="background-color: lightgrey; border: 1px solid black; padding: 2px;">T</span> Transformer Hum
<span style="background-color: lightblue; border: 1px solid black; padding: 2px;">E</span> Electronic	<span style="background-color: orange; border: 1px solid black; padding: 2px;">F</span> Flickers	<span style="background-color: red; border: 1px solid black; padding: 2px;">X</span> Fails
	<span style="background-color: yellow; border: 1px solid black; padding: 2px;">B</span> Blinks	<span style="background-color: green; border: 1px solid black; padding: 2px;">E</span> Exceeds Transformer Power Rating
	<span style="background-color: cyan; border: 1px solid black; padding: 2px;">b</span> Buzzes	<span style="background-color: white; border: 1px solid black; padding: 2px;">U</span> Under Test





# LAMINA® LIMITED WARRANTY

Lamina warrants this product ("Product") against defects in material or workmanship for a period of one (1) year; (two (2) years in the European Union if you are an individual consumer) from the date of purchase. If this Product is determined to be defective, Lamina will repair or replace the Product, at its option.

This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of, or to any part of the Product. This warranty does not cover damage due to improper operation or maintenance, connection to improper voltage supply, or attempted repair by anyone than a facility authorized by Lamina to service the Product.

REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. LAMINA SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PRODUCT EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS LIMITED WARRANTY.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Only Lamina may change, amend or modify the terms of this Limited Warranty and any such change, amendment or modification shall be in writing and issued by Lamina®.

To obtain warranty service and shipping information call +1.609.265.1401 or e-mail [customerservice@laminalighting.com](mailto:customerservice@laminalighting.com) or contact Lamina, Attn: Customer Service, 120 Hancock Lane, Westampton, NJ 08060-4408. You must provide proof of purchase in the form of a bill of sale or receipted invoice which is evidence that the Product is within the warranty period to obtain warranty service. You must return the Product prepaid freight, along with payment of \$9.95 (USD) to cover return postage and handling costs.

In the European Union, consumers have legal rights under applicable national legislation governing the sale of consumer goods. Such rights are not affected by the warranties provision outlined in this document.

The Lamina SōL MR16 LED Series can be used in a wide variety of lighting applications.



\*WARNING: Not for use in fully enclosed fixtures. Non submergible. Not water tight. Operate in fixtures that provide the free flow of air around the lamp heat sink. Please call our Help Desk at +1.609.265.1401 for information regarding how to best ventilate enclosed fixtures.



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