General Specification Sheet for LITEBlock®

1.0 General

1.1 Bramal LED LITEBlock® LED lighting products have been custom developed to the highest standards in the industry ensuring high reliability and previously unattainable performance.

1.2 The LITEBlock® LED lighting system is composed of two or three main components manufactured to custom needs:

a) LED Module
b) Driver
c) Luminaire

LITEBlock® is a light engine which can be easily adapted to customer requirements either as a separate entity or integrated within a luminaire or reflector.

1.3 If LITEBlock® is to be mounted in a luminaire or reflector, Bramal LED needs to be consulted to ensure correct thermal operation and that local regulatory requirements are met. Any application can be considered by consulting with our engineering department.

1.4 Depending on application and use, our LED modules produce illumination efficiency from 104 Lm/W (Lumens per Watt) to over 140 Lm/W for numerous applications: flood lighting, e.g. bay lighting or external field applications.

1.5 The LED Driver Modules have been configured for specific LED Modules and are not client configurable or interchangeable with other products. The Driver module is usually mounted along with the LED module resulting in an integrated structure complying with the most rigorous safety and performance standards.

1.6 Our LITEBlock® LED lighting series is designed to give our clients the utmost flexibility enabling adaption to most applications. The specifications listed below are of general capability; however we would consider inquiries which extend beyond our published data.

T: 450 763 1443
www.bramalled.com

2.0 General LITEBlock® LED Specifications

TABLE 1 Utility Voltage and Power Characteristics

DRIVER(s)	
Input Voltage Range:	90 ~ 347 VAC (40Hz ~ 400Hz)
Rated Wattage:	Models from 9W to 350W
Input Current:	Rated Wattage/90V AC RMS
Harmonic Currents:	To IEC 1000-3-2 (See Appendix A)
P.F. (Power Factor)	0.97 ~ 1.00 Depending on Input Voltage
T.H.D. (Total Harmonic Distortion)	< 16% All Models
Compliances: (Pending)	CSA C22.2 No. 250.13-14; UL 8750, 1st Ed.
FCC: (Pending)	US: FCC 47 CFR Part 15; Canada, ICES-005
Operating Ambient Temperature Range:	-45 ºC to 50 ºC
Control (Optional):	To IEC 60929 Annex E for DC control: 0 ~ 100% - (Control voltage 0 ~ 10V DC) ; DMX512 option.
Environmental:	Dry and wet locations IP65 minimum; IP68 to special order.
Installation:	In approved luminaires: To UL48 & CSA C22.2 No. 207 for signs; UL 1598 & CSA C22.2 No. 250.0 for fixed installations.

T: 450 763 1443
www.bramalled.com

TABLE 2 LED Module Characteristics

LED MODULE(s)	
Input Voltage Range:	Specific to driver module.
Rated Wattage:	Models from 9W to 350W
Color Temperature:	3500K to 6000K
System Efficacy:	104 ~ 150 Lm/W
Operating Ambient Temperature Range:	-45 ºC to 50 ºC
Installation:	In approved luminaires: To UL48 & CSA C22.2 No. 207 for signs; UL 1598 & CSA C22.2 No. 250.0 for fixed installations.
Compliance: (Pending)	CSA C22.2 No. 250.13-14; UL 8750, 1st Ed.
Environmental:	Dry and wet locations up to IP68

T: 450 763 1443
www.bramalled.com

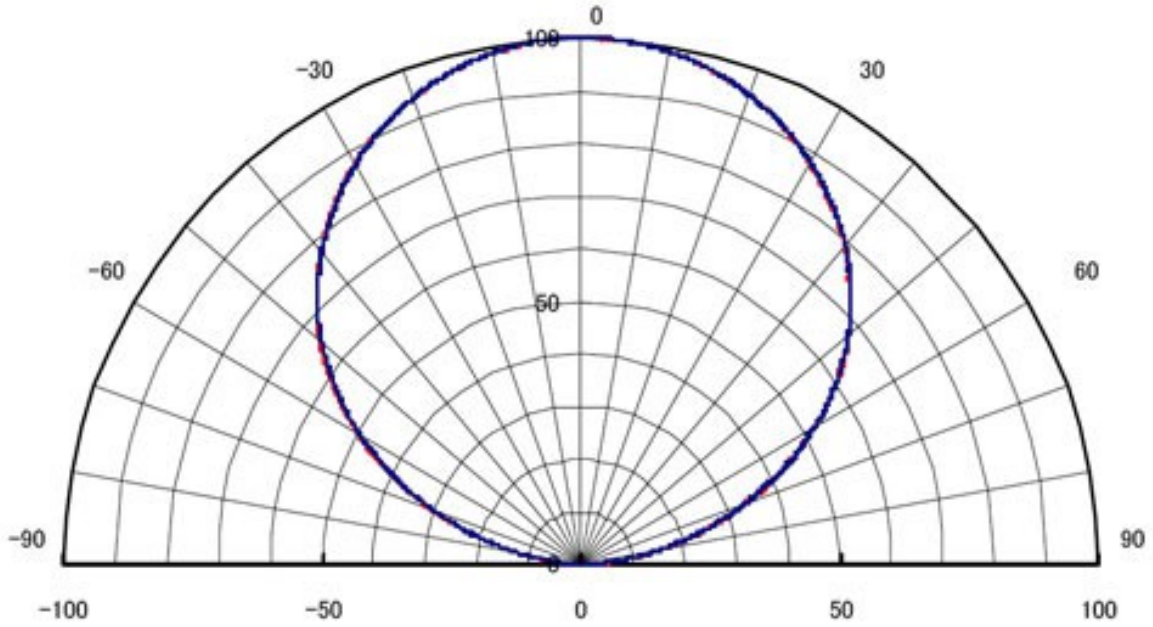
3.0 System Specifications

TABLE 3 System Characteristics

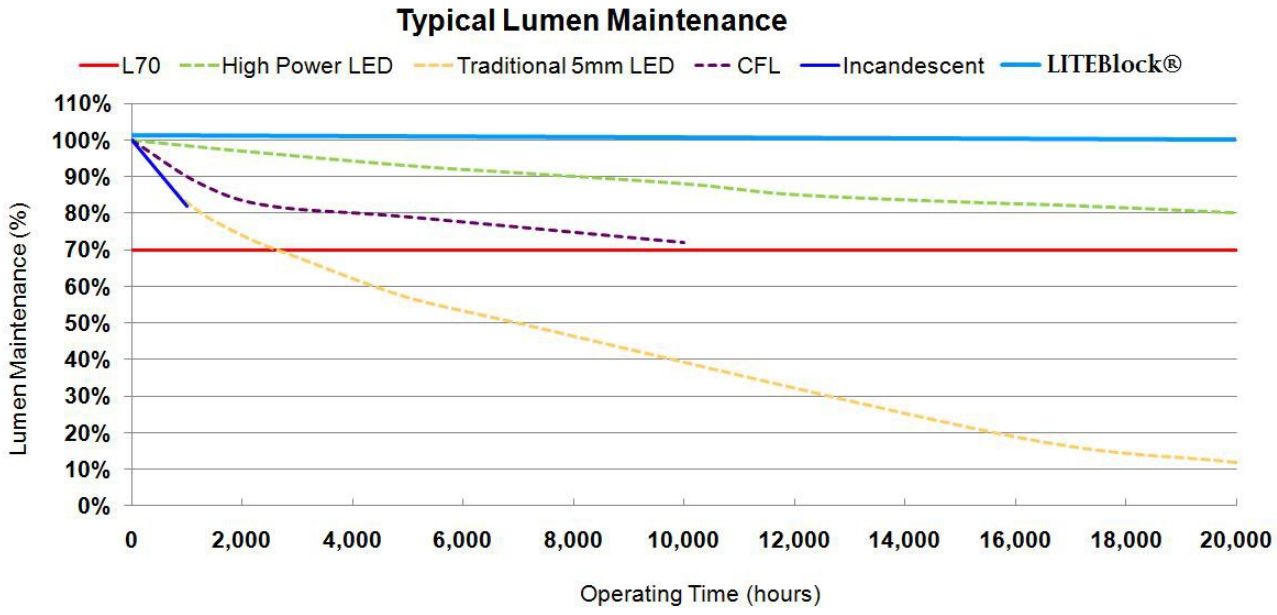
SYSTEM	
Average Life:	20 Years (Based on MTBF of 200,000 hrs at 40 deg. C – Derate by factor of 2 for every 10 deg. C temperature rise above 40 deg. C)
Lumen Maintenance:	LEDs are to IESNA LM-80-2008; (Reported TM-21 L70 Lifetime :> 36,000 hours @ 55ºC and 60 m.a.)
Average Chromaticity Shift:	0.0014 @ 6000 hours (Δu'v')
CRI:	83 Minimum; 84 Typical
Minimum Starting Temperature:	-55 ºC
Operating Ambient Temperature Range:	-45 ºC to 40 ºC
Installation:	Consult with Bramal LED engineering.
Compliances: (Pending)	To UL48 & CSA C22.2 No. 207 for signs; UL 1598 & CSA C22.2 No. 250.0 for fixed installations.
Environmental:	Dry and wet locations IP65 minimum.
Mechanical & Structural:	Consult with Bramal LED for model variants.

T: 450 763 1443
www.bramalled.com

FIGURE 1 Typical Lambertian Polar Radiation Pattern for LITEBlock® LED Modules.
(Note: This may vary according to specific reflectors and optical systems)



FFIGURE 2 Typical Lumen Maintenance



T: 450 763 1443
www.bramalled.com

4.0 Why is LITEBlock® Superior to Competition!

4.1 Most competitors high power LED Modules rely on high density COB (Chip On Board) manufacturing technology which concentrates a lot of power in a small area – creating hot-spots. LITEBlock® does not have this disadvantages.

4.2 Because thermal management is tricky, slight manufacturing flaws may lead to hot-spots thus current sharing between LED chips is compromised leading to a variety of future failure modes.

4.3 There are a multitude of LED chip technologies available, each with parameters leading to conflicting design compromises; each application requires the optimizing of certain parameters for specific operating conditions. Leading western manufacturers do not offer the best LED chips on the market for each application! LITEBlock® LED chips have been sourced from reputable foundries and packagers.

4.4 Usually publicized LED luminaire performance does not include final luminaire system losses, so in fact, performance is far worse in the finished product. LITEBlock® utilizes fully parameterized LED chips and employs a patented algorithm to optimize and determine luminaire performance.

4.5 Heat and optical density of LED chips are the primary factors affecting life, performance and reliability of LED lighting systems. LITEBlock® has optimized and minimized thermal and optical loading on individual LED chips.

4.6 Thermal Imaging Shows Superior Thermal Performance

T: 450 763 1443
www.bramalled.com

5.0 Bramal LED LITEBlock® Product Range.

5.1 Mural Up-Down Luminaires

UP-DOWN – LCM-UDXX-YYYY (XX and YYYY correspond to Model and Lumen Output respectively)	
Input Voltage Range:	90 ~ 347 VAC (40Hz ~ 400Hz)
Power Consumption Range:	10W ~ 40W
Lumen Range:	Models from 800LM to 5000LM
CCT Range:	3000K ~ 6000K
Lifetime/Reliability:	100,000 Hrs. Continuous use. (Refer to installation guidelines)
P.F. (Power Factor)	0.97 ~ 1.00 Depending on Input Voltage
T.H.D. (Total Harmonic Distortion)	< 16% All Models
Compliance: (Pending)	CSA C22.2 No. 250.13-14; UL 8750, 1st Ed.
FCC: (Pending)	US: FCC 47 CFR Part 15; Canada, ICES-005
Operating Ambient Temperature Range:	-45 ºC to 50 ºC
Control (Optional):	To IEC 60929 Annex E for DC control: 0 ~ 100% - (Control voltage 0 ~ 10V DC); DMX512 option.
Environmental:	Dry and wet locations IP65 minimum; IP68 to special order.
Installation:	Interior or Exterior

T: 450 763 1443
www.bramalled.com

5.2 Murals

Murals – LCM-10XX-YYYY (XX and YYYY correspond to Model and Lumen Output respectively)	
Input Voltage Range:	90 ~ 347 VAC (40Hz ~ 400Hz)
Power Consumption Range:	10W ~ 30W
Lumen Range:	Models from 800LM to 4000LM
CCT Range:	3000K ~ 6000K
Lifetime/Reliability:	100,000 Hrs. Continuous use. (Refer to installation guidelines)
P.F. (Power Factor)	0.97 ~ 1.00 Depending on Input Voltage
T.H.D. (Total Harmonic Distortion)	< 16% All Models
Compliance: (Pending)	CSA C22.2 No. 250.13-14; UL 8750, 1st Ed.
FCC: (Pending)	US: FCC 47 CFR Part 15; Canada, ICES-005
Operating Ambient Temperature Range:	-45 ºC to 50 ºC
Control (Optional):	To IEC 60929 Annex E for DC control: 0 ~ 100% - (Control voltage 0 ~ 10V DC); DMX512 option.
Environmental:	Dry or damp locations IP62 minimum.
Installation:	Interior or Exterior

T: 450 763 1443
www.bramalled.com

5.3 Cones and Sign Lighters

LCM-CONEX-YYYY (X and YYYY correspond to Model and Lumen Output respectively)	
Input Voltage Range:	90 ~ 347 VAC (40Hz ~ 400Hz)
Power Consumption Range:	10W ~ 30W
Lumen Range:	Models from 800LM to 3500LM
CCT Range:	3000K ~ 6000K
Lifetime/Reliability:	100,000 Hrs. Continuous use. (Refer to installation guidelines)
P.F. (Power Factor)	0.97 ~ 1.00 Depending on Input Voltage
T.H.D. (Total Harmonic Distortion)	< 16% All Models
Compliance: (Pending)	CSA C22.2 No. 250.13-14; UL 8750, 1st Ed.
FCC: (Pending)	US: FCC 47 CFR Part 15; Canada, ICES-005
Operating Ambient Temperature Range:	-45 ºC to 50 ºC
Control (Optional):	To IEC 60929 Annex E for DC control: 0 ~ 100% - (Control voltage 0 ~ 10V DC); DMX512 option.
Environmental:	Dry and wet locations IP65 minimum; IP68 to special order.
Installation:	Interior or Exterior

T: 450 763 1443
www.bramalled.com

5.4 High Bay / Spot Beam 12In.

HB/SB 12In – XX-YYYY (XX and YYYY correspond to Model and Lumen Output respectively)	
Input Voltage Range:	90 ~ 347 VAC (40Hz ~ 400Hz)
Power Consumption Range:	60W ~ 100W
Lumen Range:	Models from 9000LM to 14,000LM
CCT Range:	3000K ~ 6000K
Lifetime/Reliability:	100,000 Hrs. Continuous use. (Refer to installation guidelines)
P.F. (Power Factor)	0.97 ~ 1.00 Depending on Input Voltage
T.H.D. (Total Harmonic Distortion)	< 16% All Models
Compliance: (Pending)	CSA C22.2 No. 250.13-14; UL 8750, 1st Ed.
FCC: (Pending)	US: FCC 47 CFR Part 15; Canada, ICES-005
Operating Ambient Temperature Range:	-45 ºC to 50 ºC
Control (Optional):	To IEC 60929 Annex E for DC control: 0 ~ 100% - (Control voltage 0 ~ 10V DC); DMX512 option.
Environmental:	Dry and wet locations IP65 minimum; IP68 to special order.
Installation:	Interior or Exterior

T: 450 763 1443
www.bramalled.com

5.5 High Bay / Spot Beam 17In.

HB/SB 17 In – XX-YYYY (XX and YYYY correspond to Model and Lumen Output respectively)	
Input Voltage Range:	90 ~ 347 VAC (40Hz ~ 400Hz)
Power Consumption Range:	150W ~ 230W
Lumen Range:	Models from 18,000LM to 30,000LM
CCT Range:	3000K ~ 6000K
Lifetime/Reliability:	100,000 Hrs. Continuous use. (Refer to installation guidelines)
P.F. (Power Factor)	0.98 ~ 1.00 Depending on Input Voltage
T.H.D. (Total Harmonic Distortion)	< 16% All Models
Compliance: (Pending)	CSA C22.2 No. 250.13-14; UL 8750, 1st Ed.
FCC: (Pending)	US: FCC 47 CFR Part 15; Canada, ICES-005
Operating Ambient Temperature Range:	-45 ºC to 50 ºC
Control (Optional):	To IEC 60929 Annex E for DC control: 0 ~ 100% - (Control voltage 0 ~ 10V DC); DMX512 option.
Environmental:	Dry and wet locations IP65 minimum; IP68 to special order.
Installation:	Interior or Exterior

T: 450 763 1443
www.bramalled.com

APPENDIX A

HARMONIC LIMITS FOR IEC 1000-3-2

CLASS A*

Harmonic (n)	Max. Current
Odd	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15 ≤ n ≤ 39	0.15 * 15/n
Even	
2	1.08
4	0.43
6	0.30
8 ≤ n ≤ 40	0.23 * 8/n

*For Class B, multiply by 1.5

CLASS C

Harmonic (n)	Max. Percentage of the input current at
2	2
3	30 * λ
5	10
7	7
9	5
11 ≤ n ≤ 39	3

λ is the circuit power factor

CLASS D

Harmonic (n)	Max. current per watt mA/W	Max current A
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13 and on	extrapolate 3.85/n	see Class A

Equipment Classification:

Class A: Balanced three phase, and all other equipment not included in B through D
Class B: Portable tools
Class C: Lighting equipment (including dimmers)
Class D: Equipment P ≤ 600W with special input current wave shape, if not included in A through C. (Many low power products with switching power supplies, e.g. PC's, printers and fax machines fall into this category.)

T: 450 763 1443
www.bramalled.com

NOTICE

Information in this document is provided solely in connection with **BRAMAL LED** products. **BRAMAL LED** reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.
All **BRAMAL LED** products are sold pursuant to **BRAMAL LED**'s terms and conditions of sale.
Purchasers are solely responsible for the choice, selection and use of the **BRAMAL LED** products and services described herein, and **BRAMAL LED** assumes no liability whatsoever relating to the choice, selection or use of the **BRAMAL LED** products and services described herein.
No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by **BRAMAL LED** for the use of such third party products
or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN **BRAMAL LED**'s TERMS AND CONDITIONS OF SALE **BRAMAL LED** DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF **BRAMAL LED** PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.
UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, **BRAMAL LED** PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE.

T: 450 763 1443
www.bramalled.com