

HPWINNER

Modules drive the imagination.
Customized lighting solution manufacturer.

Modules



HANGZHOU HPWINNER OPTO CORPORATION

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PROBLEM ANALYSIS ON LED OUTDOOR LIGHTING APPLICATIONS



PROBLEM ANALYSIS ON OPTICAL LIGHTING SOLUTIONS

Various lighting distributions are required to deal with changing environments and conditions in order to avoid optical disturbance to people's lives.

1. Zebra effect (luminance uniformity) on long-spacing roadways



2. Zebra effect (luminance uniformity) on ordinary roads



3. Glare

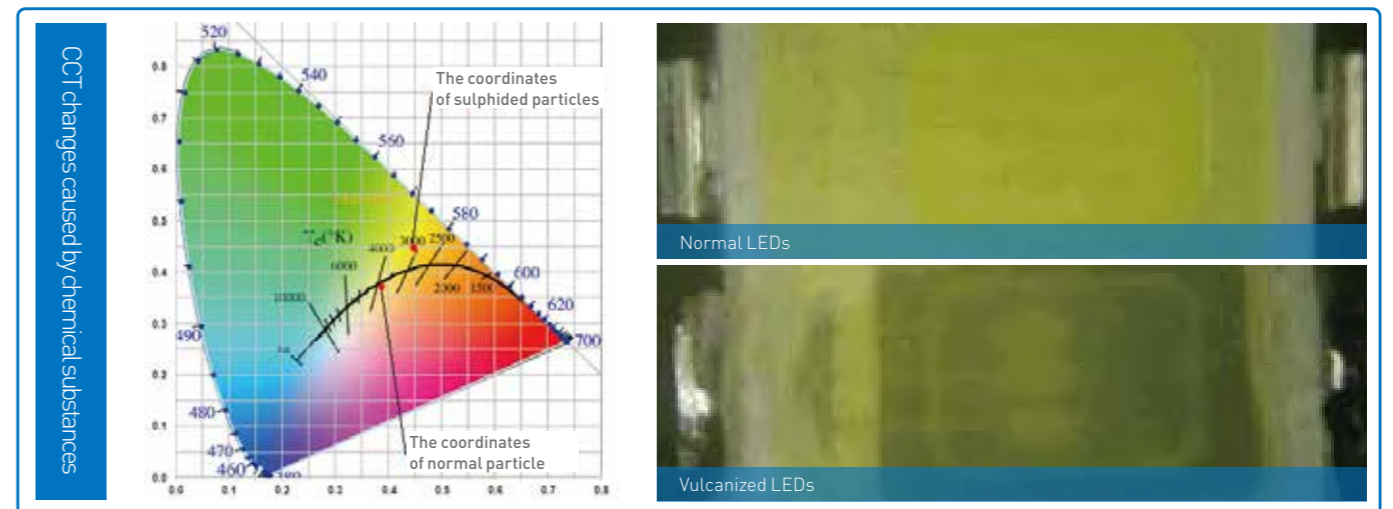
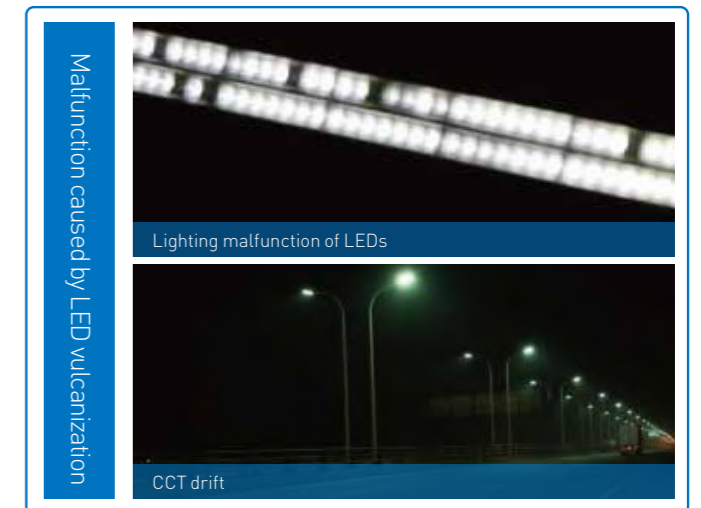
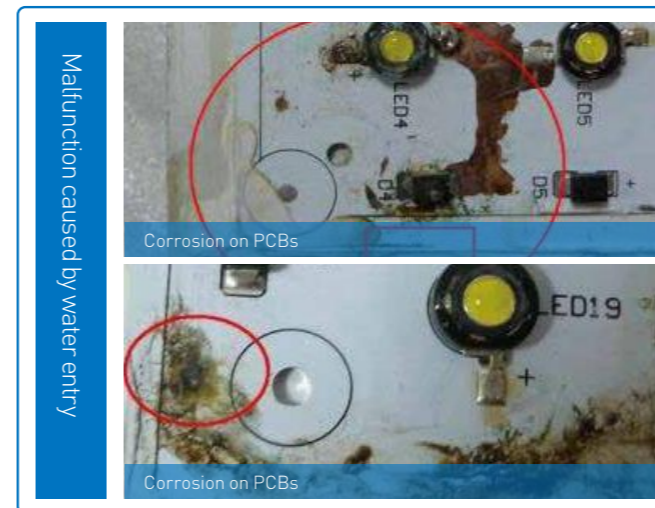


4. Light pollution



PROBLEM ANALYSIS ON RELIABILITY SOLUTIONS

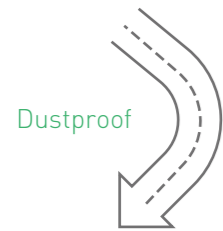
Protection issues



PROBLEM ANALYSIS ON RELIABILITY SOLUTIONS

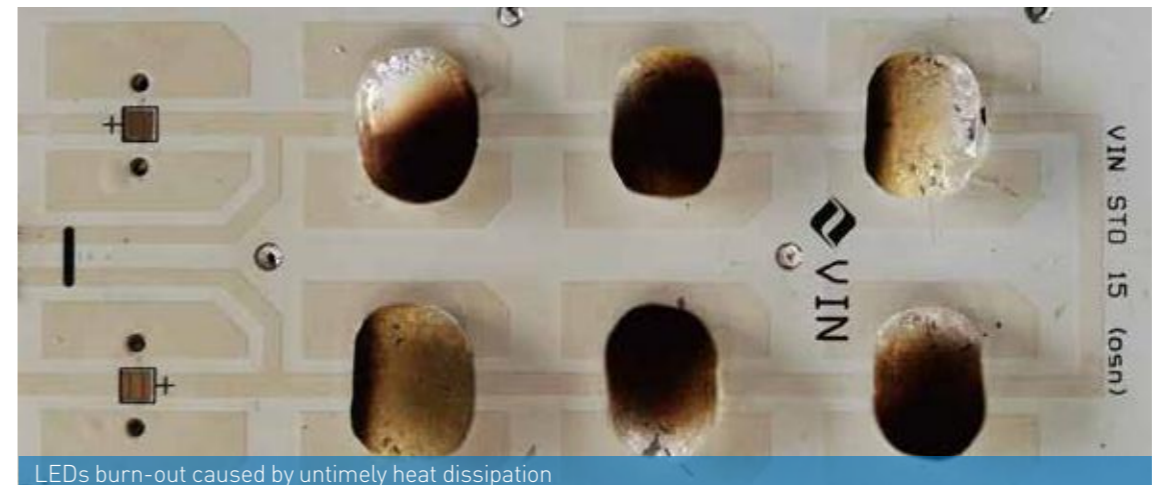
Solution: IP protection rating of LED modules should be IP 68

Modules with protection rating under IP68 may face LED malfunctions due to the corrosion on LEDs and PCBs induced by vapor and noxious gases



IP68 protection rating

Problems of heat dissipation



LEDs burn-out caused by untimely heat dissipation

Electrical problems



LEDs burn-out caused by overcurrent

PROBLEM ANALYSIS ON RELIABILITY SOLUTIONS

LED should work under the conditions of its lifetime permits

The manual of LUMILEDS LEDs

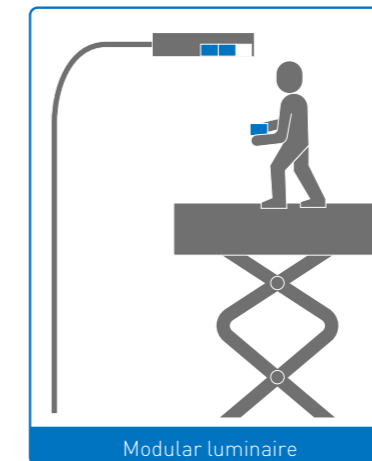
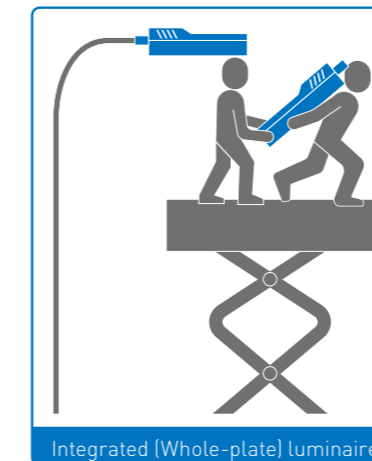
PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current[1,2]	240mA for 24V 800mA for 6V
Peak Pulsed Forward Current[1,3]	300mA for 24V 1000mA for 6V
LED Junction Temperature[1][DC & Pulse]	125°C
ESD Sensitivity (ANS/ESDA/JEDEC JS-001-2012)	Class 2
Operating Case Temperature[1]	105°C
LED Storage Temperature	-40°C to 105°C
Reverse Voltage (Vreverse)	LUXEON LEDs are not designed to be driven in reverse bias

The manual of CREE LEDs

Base Material	Type	OK In XLamp LED Designs*	Outgas Tested	Issues Found	Issues Suspected
Acetic acid	Acid				Yes
Acrylic rubber	Rubber/plastic seal				Yes
Acetone	Manufacturing material			Yes	
Acrylonitrile butadiene styrene (ABS)	Structural plastic	Yes			
Ammonia	Alkaline				Yes
Benzene	Solvent				Yes
Butadiene rubber	Rubber/plastic seal				Yes
Butyl rubber	Rubber/plastic seal				Yes
Chlorinated polyethylene	Rubber/plastic seal				Yes
Chlorobutyl	Rubber/plastic seal				Yes
Chlorosulphonated rubber	Rubber/plastic seal				Yes
Cyanoacrylate	Sealant & adhesive		Yes	Yes	
DCA SCC3	Coating/potting	Yes	Yes		
Dichloromethane	Solvent				Yes
Epichlorhydrin	Rubber/plastic seal				Yes
Gasoline	Solvent				Yes
Graphite gasket	Thermal compound	Yes	Yes		

PROBLEM ANALYSIS ON MAINTENANCE SOLUTIONS

Maintenance and replacement



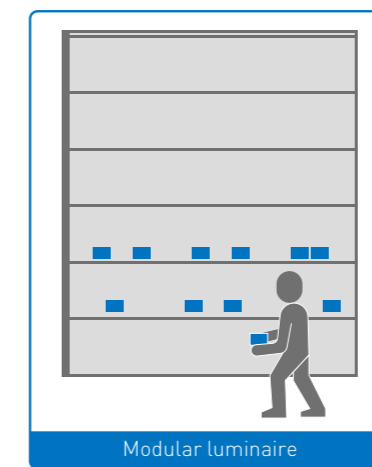
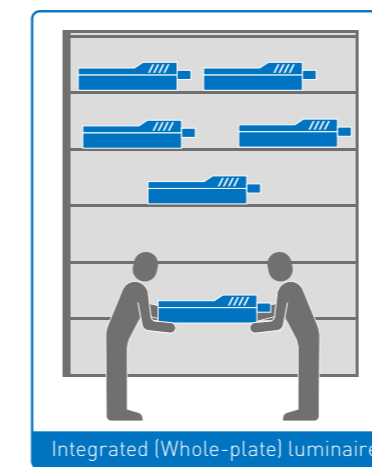
Integrated (Whole-plate) luminaire

The maintenance and replacement of integrated luminaire needs two operators at least, one holding the heavy fixture and the other replacing it with tools.

Modular luminaire

The maintenance and replacement of modular luminaire only requires changing of some components, which could be replaced by only one operator without tools due to the light weight.

Inventory of spare parts



Integrated (Whole-plate) luminaire

The fixture itself is the spare part of integrated street lighting. It takes large space and much manual operation, requiring several people to carry the heavy fixture.

Modular luminaire

The module is the spare part of modular street lighting. It takes small space and much less operation, which is as convenient as replacing bulbs.

ABOUT HPWINNER



COMPANY PROFILE



HPWINNER (stock code 833888), is an ambitious company committing itself to becoming a worldwide leader in outdoor high-power LED lighting application industry. It is acknowledged as a pacemaker in China outdoor lighting industry, an inventor of new industrial techniques, and a formulator of new standards. HPWINNER was established in July, 2011. Headquartered in Hangzhou with its manufacturing base located in Changxing National-level economic and technological development zone in Zhejiang Province, the company has grown up to a staff of over 800.

Since its establishment, HPWINNER has been rapidly developing its business all over the world. In 2014, it was entitled as a National High-tech Enterprise. In October, 2015, it landed the New OCT Market. In 2017, it was awarded as "Zhejiang Enterprise Technology Center", "Zhejiang Provincial Enterprise Research Institute" and other honors. In March, 2018, its smart manufacturing base went into operation. Totally, the base is planned to cover a land area of 333,300 square meters, and to have a building area of around 400,000 square meters. When all planned facilities were brought into production, it should be able to output 10 millions sets of luminaires and accessories per year. Up to now, there are five buildings with 75,000-square-meters' floor area for molding workshop, die casting workshop, precision machining workshop, powder coating workshop and assembly workshop. HPWINNER has now realized a vertical integration of industrial clusters. Guided by innovation of Industry 4.0, the manufacturing base could provide customers with comprehensive industrial services at high efficiency and high quality, including designing, molding, die casting, finishing, coating, assembly, guidance, and after-sale services.

HPWINNER's R&D team is composed of over one hundred members, each graduated from well-known universities in China and overseas in the areas of optics, thermodynamics, industrial design, electrical engineering, information engineering, arts, etc. The core designers are all well-experienced in domestic and international important programs for industrial products. The team participated in several national research programs, and drafted over 70 different national, social organizational, industrial, and local standards. The abilities of this powerful team gives HPWINNER unmatched technical strengths that allow it to have applied for over 700 worldwide patents at an increasing speed of one patent per week on average. Therefore, it offers a secure backing for clients' intellectual properties.

HPWINNER provides one-stop services from innovation to execution, and fundamentally accomplish a three-dimensional solution innovation mode.



DEVELOPMENT OF HPWINNER

In the spirit of professional dedication, HPWINNER provides customers with optimal lighting application solutions, and does its utmost to boost the lighting industry in a healthy and rapid developing direction.



REMARKABLE MANUFACTURING CAPACITY



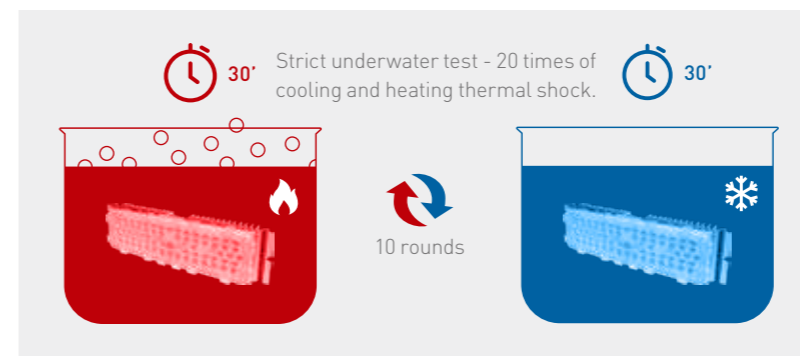
AUTHORITATIVE LABORATORY IN THE LED LIGHTING INDUSTRY

HPWINNER'S TECHNICAL ADVANTAGES



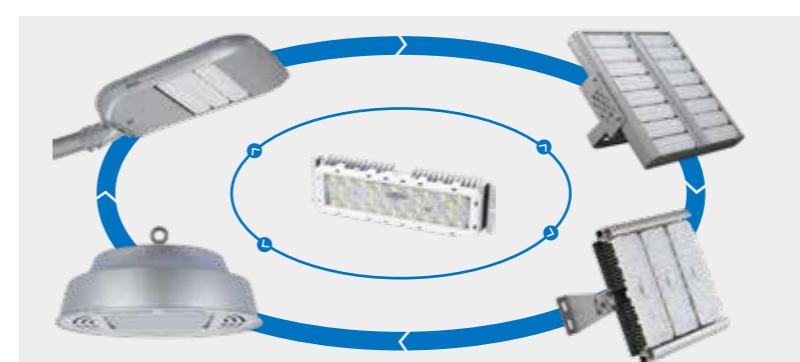
Ergonomic lighting distribution

To human eyes, brightness is sensible, but illuminance is imperceptible. Based on that, iso-brightness lighting distribution was adopted to avoid visual bright spot and dark spot on roadways, so that to make people visually comfortable, to improve illuminance values beneath the lighting and to obtain qualified test data.



Double coupling IP68 protection

HPWINNER's exclusive screw-free structure was adopted to prevent vapor from permeating through the screw holes. The LEDs are completely isolated from the outside with two layers of silicone rubber to preclude corrosion on LEDs and PCB by vapor and noxious gases.



Free combination of LED modules

Different power options are easily available with different numbers of modules, in free combination for street lights, tunnel lights, flood lights, or high bay lights at different wattage. Strict underwater test - 20 times of cooling and heating thermal shock. 10 rounds.

PRODUCT INTRODUCTION



PRODUCT COLLECTIONS OF LED MODULES

M1A-VA



M1F-CA



M2A-VA



M11A-XC



M15D-XB



M16A-CB



M16B-VB



M6A-VA



M6A-VC



M8A-CC



M18A-VB



M18A-CB



M19A-CC



M20A-CB



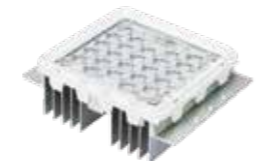
M8B-VC



M12A-XA



M12A-XB



M28A-CA



M28A-VA



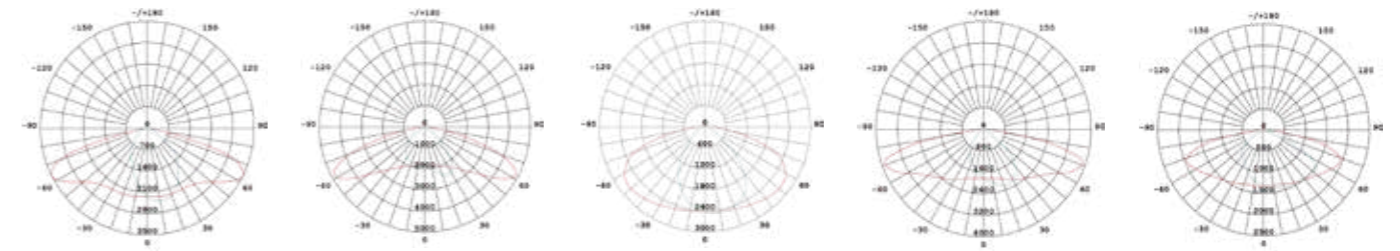
M35A-XC



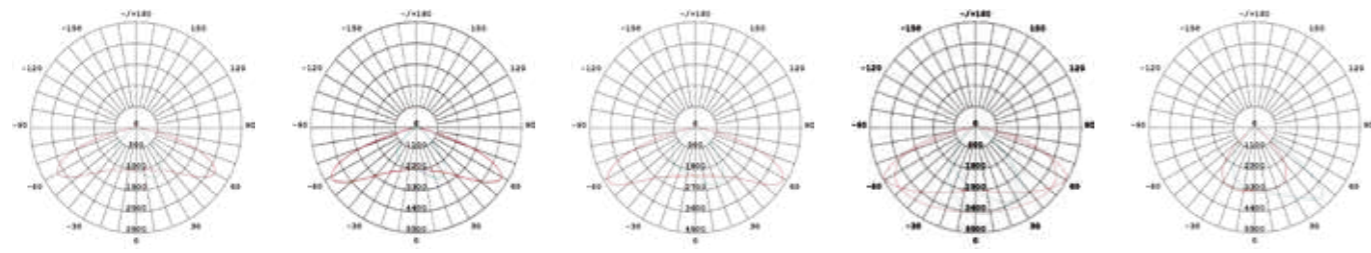
M25A-XA



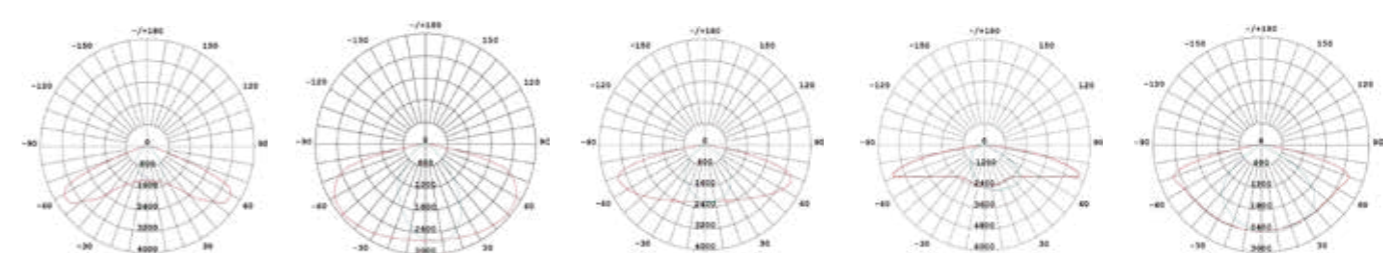
ROADWAY LIGHTING DISTRIBUTIONS



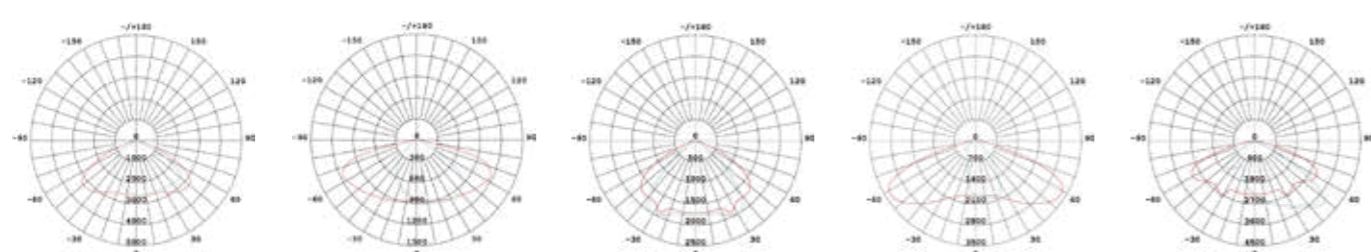
M12A-XC-T1S2213 M12A-XB-T1S1210 M12A-XB-T2S2210 M12A-XB-T2S2219 M12A-XB-T3M2240



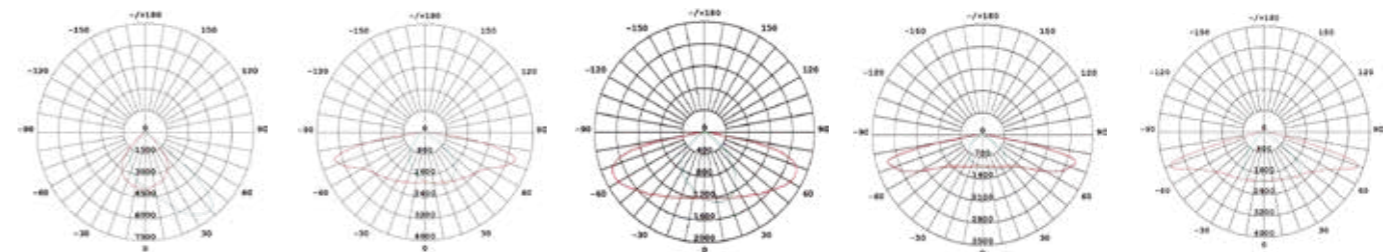
M7B-XB-T1S1981 M7C-XB-T1S1941 M7D-XB-T1S1961 M7D-XB-T2S2967 M7D-XB-T2S2969



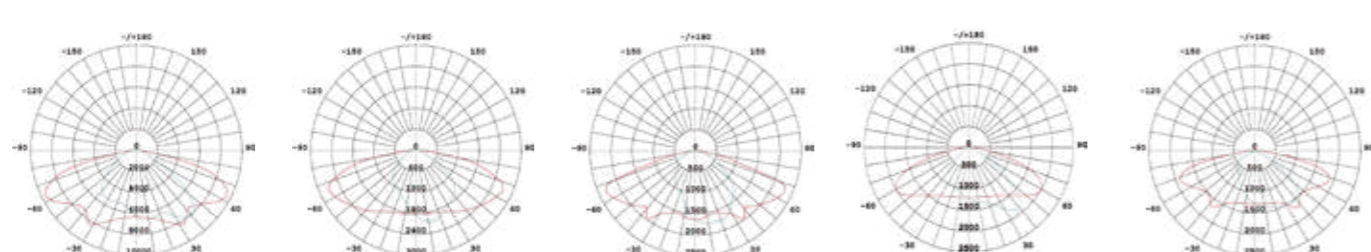
M16/M20-T1S1107 M16/M20-T1S3105 M16/M20-T2S2105 M16/M20-T2S3106 M16/M20-T2S3108



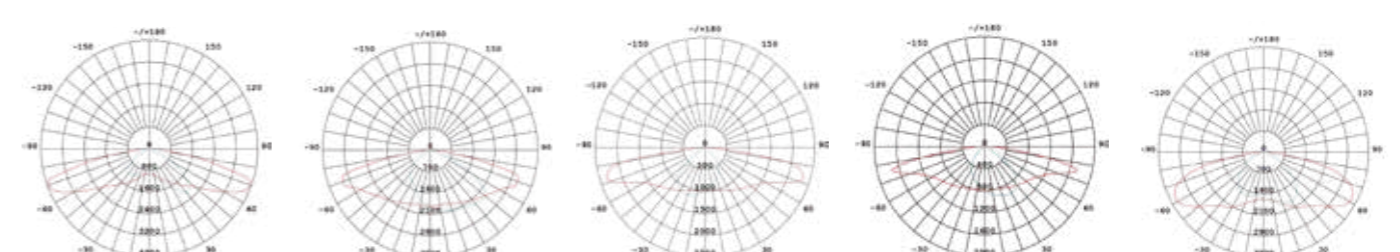
M7D-XB-T2S1969 M7B-T3M2885 M8B-TL1390 M8B-T1S5323 M8B-T2S1324



M16/M20-T2S2212 M16/M20-T3M2109 M18A-T2S2231 M18A-T2M1232 M28A-T2M2351



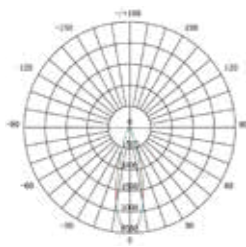
M8B-T2S2201 M8B-T2S2321 M8B-T2S2322(V) M8B-T2S5321 M8B-T3M1321



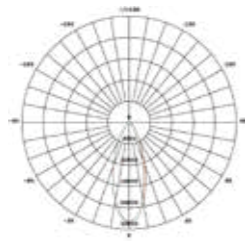
M16/M20-T2M2111 M16/M20-T3M2127 M18A-T2M2233 M18A-T3M2237 M35A-T1S2341

*More lighting distribution options are in development. Please contact sales for more information.

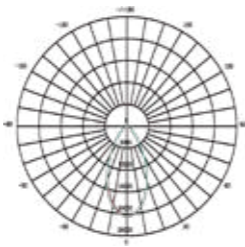
FLOODLIGHT LIGHTING DISTRIBUTIONS



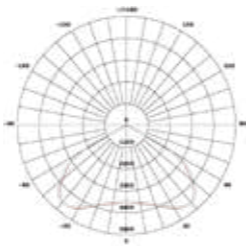
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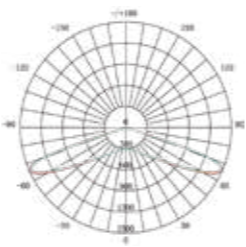
M1A-40D1540



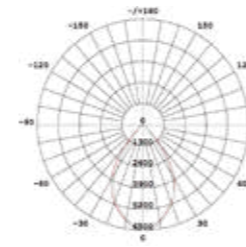
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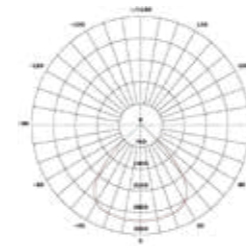
M1A-110D1010



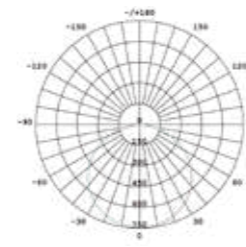
M1A-T5S3040



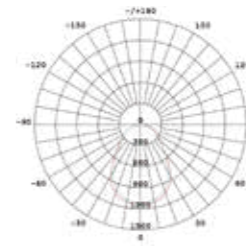
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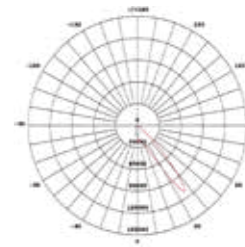
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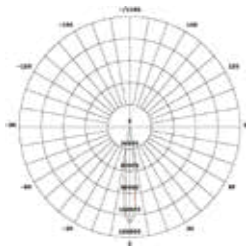
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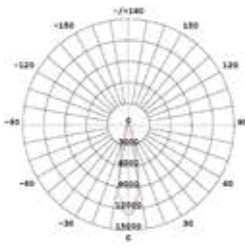
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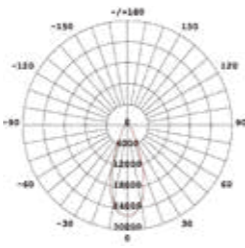
M12A-XA-STADIUM2318



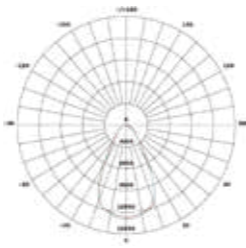
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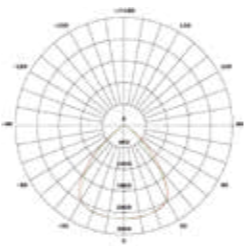
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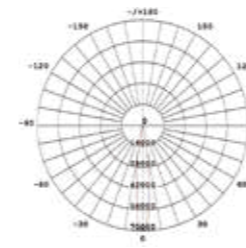
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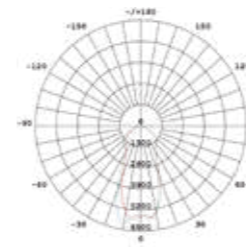
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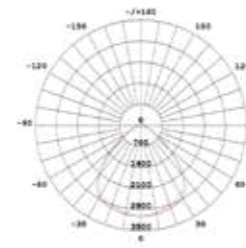
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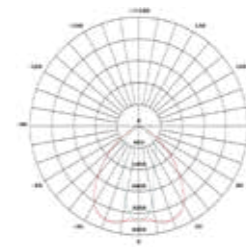
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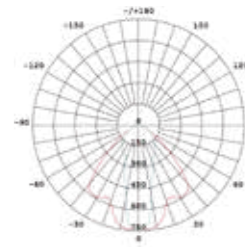
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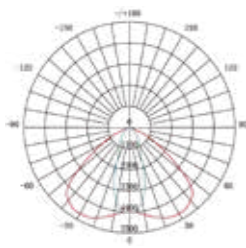
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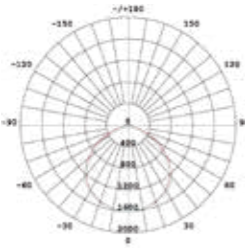
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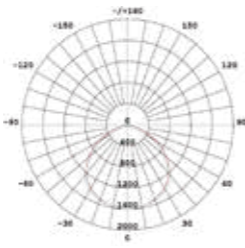
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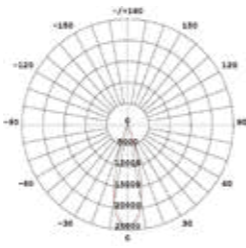
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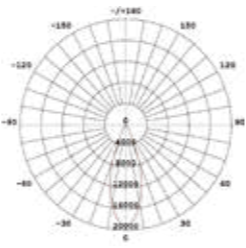
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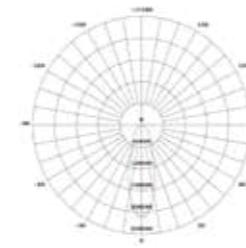
M8B-LBN1310



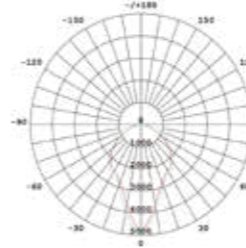
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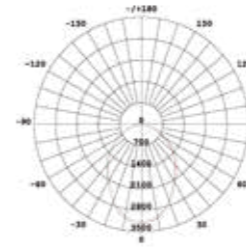
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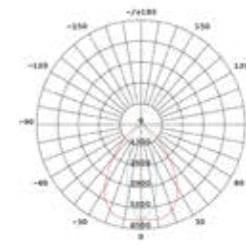
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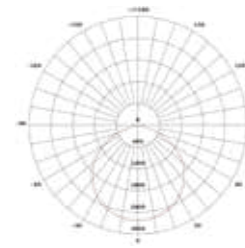
M12A-XB-60D2260



M12A-XB-90D2290



M12A-XB-90X40D2216



M12A-XC-LBN2214

*More lighting distribution options are in development. Please contact sales for more information.

FULL COVERAGE OF OUTDOOR LIGHTING APPLICATION

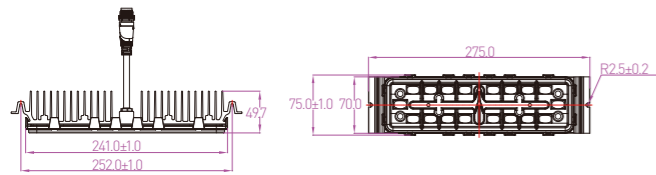
We offer differentiated solutions for each scenario with our competitive outdoor lighting products. In order to meet people's physiological and psychological needs confronted with changing time and space.



MODULE COLLECTIONS OF ROADWAY LIGHTING APPLICATIONS

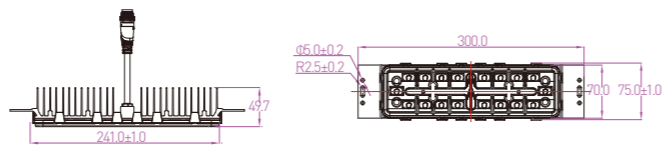
M1A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



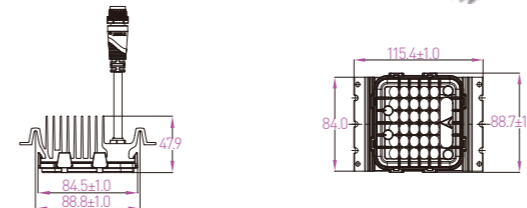
M1F-CA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



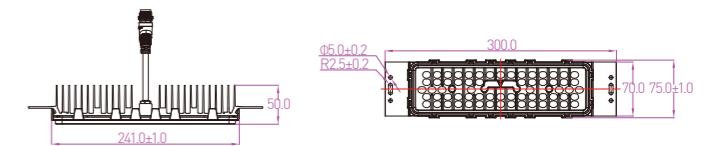
M6A-VC

LED package 3030
Max. power 30W
Typical system luminous efficacy 117lm/W



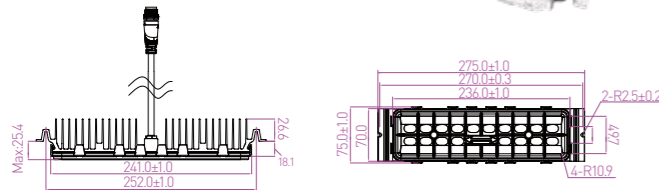
M8A-CC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



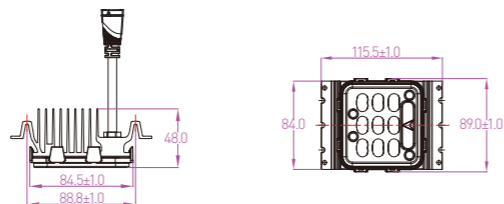
M2A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



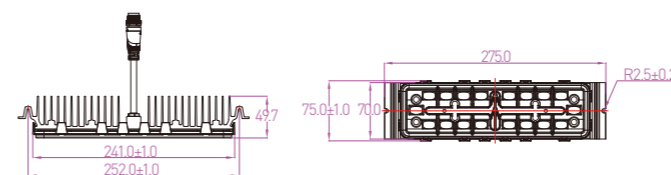
M6A-VA

LED package 3535
Max. power 30W
Typical system luminous efficacy 100lm/W



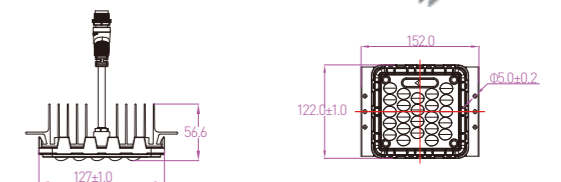
M8B-VC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



M12A-XB

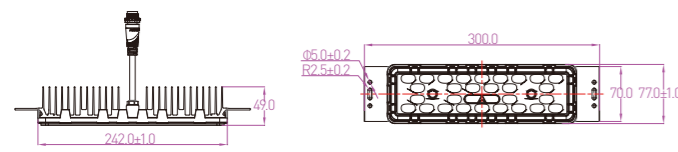
Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 140lm/W



MODULE COLLECTIONS OF ROADWAY LIGHTING APPLICATIONS

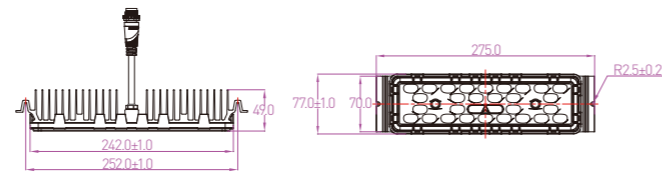
M16A-CB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 145lm/W



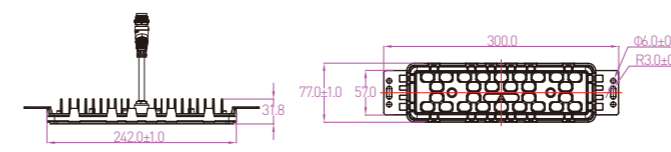
M16B-VB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 145lm/W



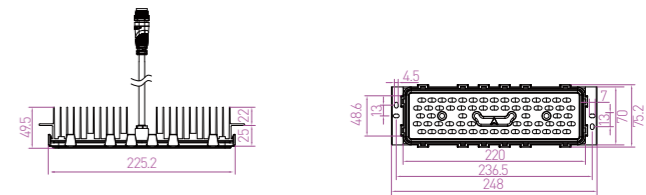
M20A-CB

Customized LEDs from a world-leading supplier
Max. power 40W
Typical system luminous efficacy 160lm/W



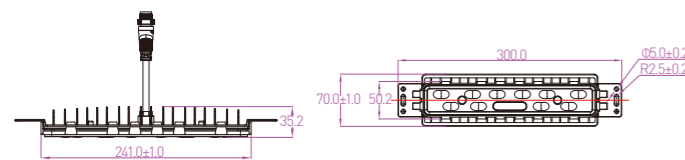
M35A-XC

LED package 3535
Max. power 60W
Typical system luminous efficacy 110lm/W



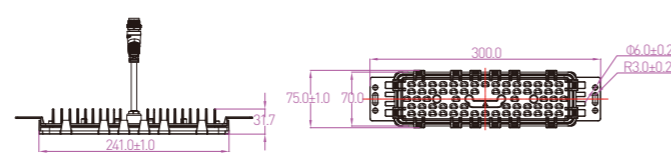
M18A-CB

Customized LEDs from a world-leading supplier
Max. power 40W
Typical system luminous efficacy 125lm/W



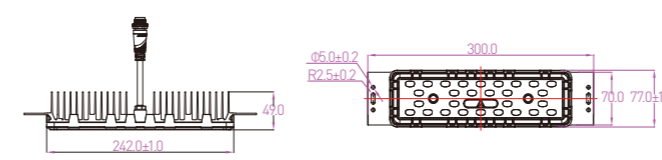
M19A-CC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



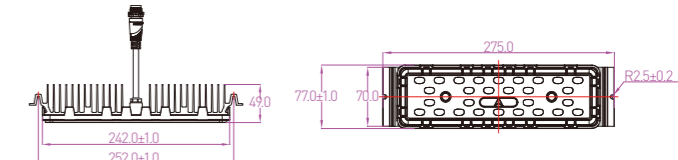
M28A-CA

LED package 3535
Max. power 60W
Typical system luminous efficacy 125lm/W



M28A-VA

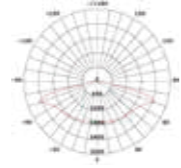
LED package 3535
Max. power 60W
Typical system luminous efficacy 125lm/W



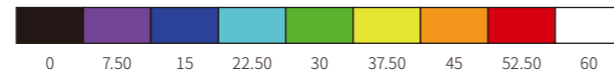
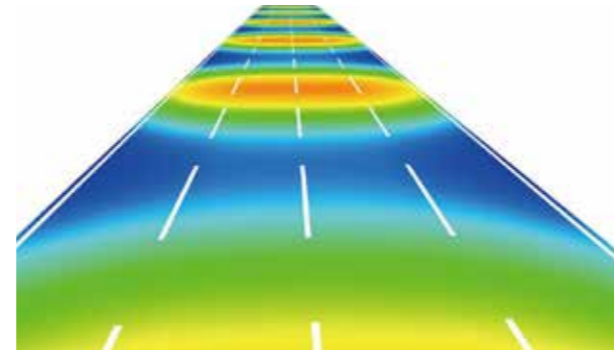
* The typical system luminous efficacy of M18A-CB is measured at its maximum power with 92% power efficiency.
* The typical system luminous efficacy of the modules other than M18A-CB are measured at their maximum powers with 92% power efficiency.

ROADWAY LIGHTING SETTINGS

Roadway Scenario 1



#3702 IESNA Type II Medium (iso-brightness) lighting distribution

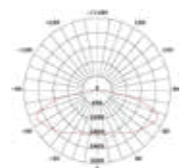


Roadway conditions Two-way four lanes, Width: 14m, Pole arrangement: two-sided and symmetrical, Pole height: 12m, pole distance 40m, elevation angle 15°, Arm length 1.5m, distance between pole and road 0.6m.

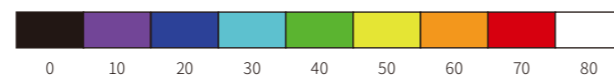
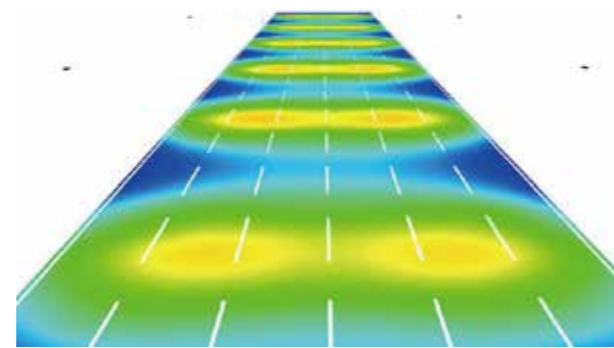
Product information M1A-VA module, lens #3702, power 150W, luminous efficacy 110lm/W.

Lighting effect Eav 30lx, UE 0.623, Lav 1.87cd/m², Uo 0.65, UL 0.84, TI 9%, SR0.61.

Roadway Scenario 2



#2321 IESNA Type II Short (iso-brightness) lighting distribution

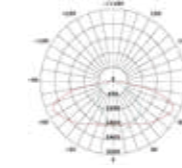


Roadway conditions Two-way six lanes, Width 21m, Pole arrangement: two-sided and symmetrical, Pole height 12m, pole distance 40m, elevation angle 15°, Arm length 1.5m, Arm length 1.5m, distance between pole and road 0.6m.

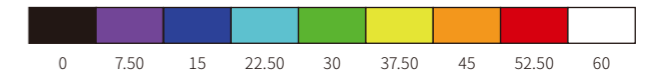
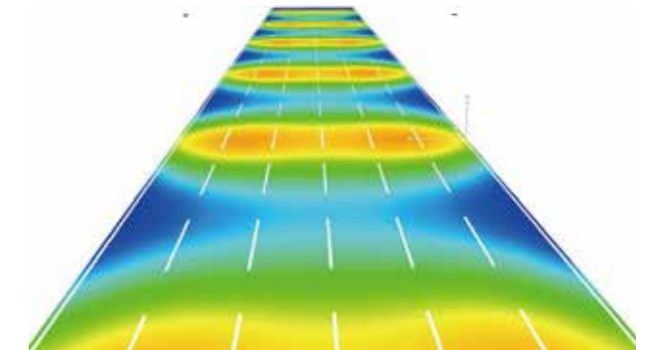
Product information M8B-VC module, lens #2321, power 200W, luminous efficacy 120lm/W.

Lighting effect Eav 36lx, UE 0.620, Lav 2.24cd/m², Uo 0.66, UL 0.84, TI 8%, SR0.57.

Roadway Scenario 3



#2105 IESNA Type II Short (iso-brightness) lighting distribution

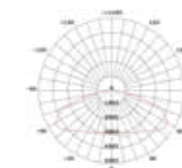


Roadway conditions Two-way six lanes, Width 21m, Pole arrangement: two-sided and symmetrical, Pole height 12m, pole distance 40m, Arm length 1.5m, distance between pole and road 0.6m

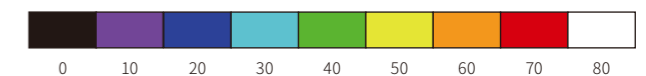
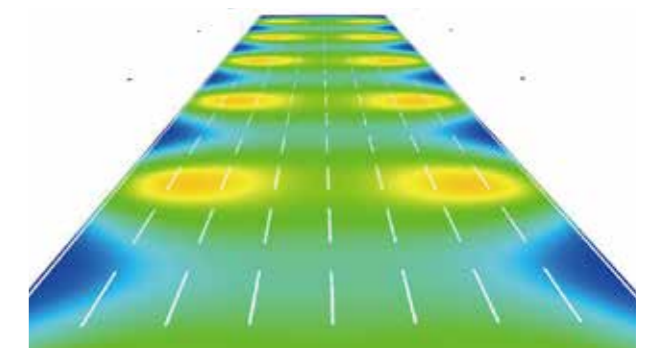
Product information M16B-VB module, lens #2105, power 120W, luminous efficacy 150lm/W, elevation angle 15°.

Lighting effect Eav 30lx, UE 0.605, Lav 1.91cd/m², Uo 0.67, UL 0.89, TI 9%, SR0.57.

Roadway Scenario 4



#3106 IESNA Type II Short (iso-brightness) lighting distribution



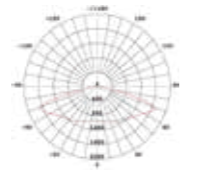
Roadway conditions Two-way eight lanes, Width 28m, Pole arrangement: two-sided and symmetrical, Pole height 12m, pole distance 40m, elevation angle 15°, Arm length 1.5m, distance between pole and road 0.2m.

Product information M16B-VB module, lens #3106, power 200W, luminous efficacy 150lm/W.

Lighting effect Eav 39lx, UE 0.633, Lav 2.35cd/m², Uo 0.59, UL 0.80, TI 10%, SR0.6.

ROADWAY LIGHTING SETTINGS

Roadway Scenario 5

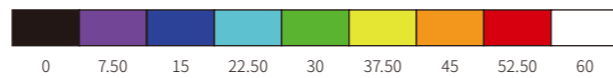
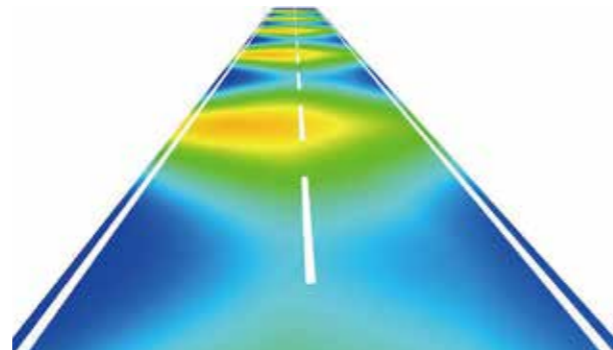


#2701 IESNA Type III Medium (iso-brightness) lighting distribution

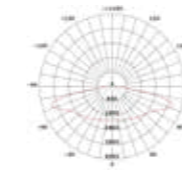
Roadway conditions One-way two lanes, Width 7m, Pole arrangement: one-side, Pole height 10m, pole distance 30m, elevation angle 15°, Arm length 2.5 meter, distance between pole and road 0.9 meter.

Product information M1A-VA module, lens #2701, power 150W, luminous efficacy 110lm/W.

Lighting effect Eav 28lx, UE 0.617, Lav 1.92cd/m², Uo 0.64, UL 0.77, TI 8%, SR0.61.



Roadway Scenario 7

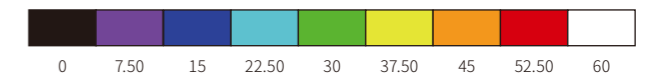
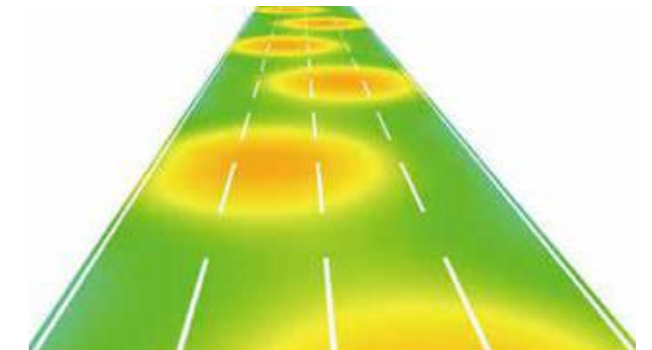


#2109 IESNA Type III Medium (iso-brightness) lighting distribution

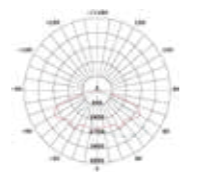
Roadway conditions Two-way four lanes, Width 14m, Pole arrangement: two-side and stagger, Pole height 12m, pole distance 50m, elevation angle 15°, Arm length 1.5m, distance between pole and road 0.6m.

Product information M16B-VB module, lens #2109, power 150W, luminous efficacy 150lm/W.

Lighting effect Eav 32lx, UE 0.738, Lav 2.52cd/m², Uo 0.62, UL 0.82, TI 9%, SR0.66.



Roadway Scenario 6

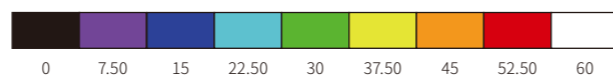
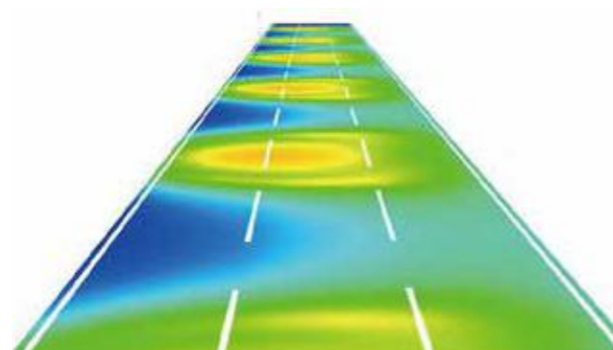


#1324 IESNA Type II Short (iso-brightness) lighting distribution

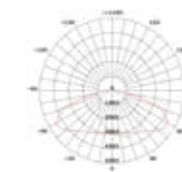
Roadway conditions One-way three lanes, Width 11m, Pole arrangement: one-side, Pole height 10m, pole distance 30m, elevation angle 15°, Arm length 1.5 meter, distance between pole and road 0.6m.

Product information M8B-VC module, lens #1324, power 180W, luminous efficacy 120lm/W.

Lighting effect Eav 28lx, UE 0.644, Lav 1.61cd/m², Uo 0.61, UL 0.86, TI 8%, SR0.67.



Roadway Scenario 8

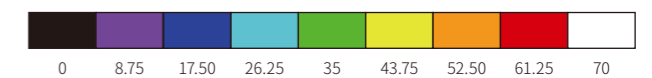
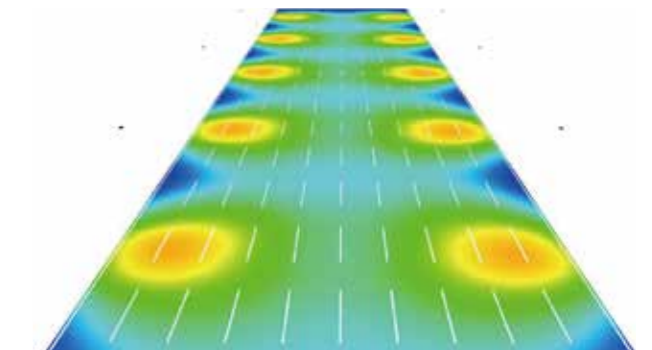


#3106 IESNA Type II Short (iso-brightness) lighting distribution

Roadway conditions Two-way ten lanes, Width 14m, Pole arrangement: two-sided and symmetrical, Pole height 12m, pole distance 40m, elevation angle 15°, Arm length 1.5m, distance between pole and road 0.2m.

Product information M16B-VB module, lens #3106, power 200W, luminous efficacy 150lm/W.

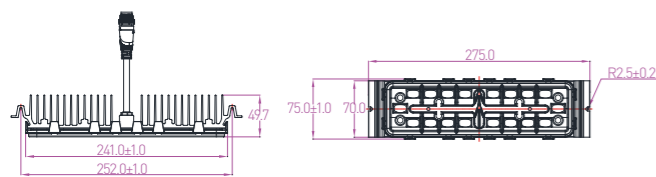
Lighting effect Eav 32lx, UE 0.610, Lav 2.04cd/m², Uo 0.58, UL 0.79, TI 0%, SR0.61.



MODULE COLLECTIONS OF TUNNEL LIGHT APPLICATIONS

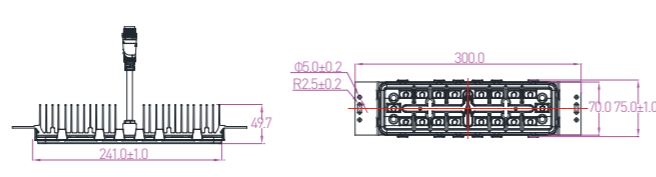
M1A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



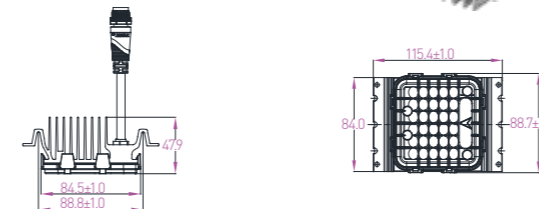
M1F-CA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



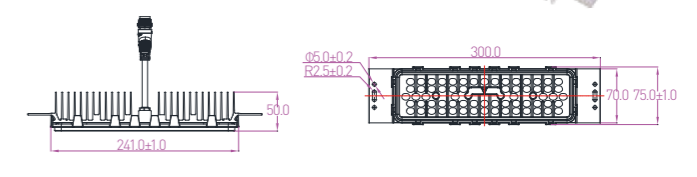
M6A-VC

LED package 3030
Max. power 30W
Typical system luminous efficacy 117lm/W



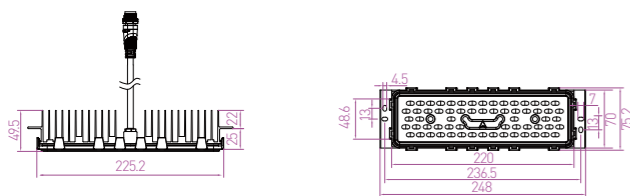
M8A-CC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



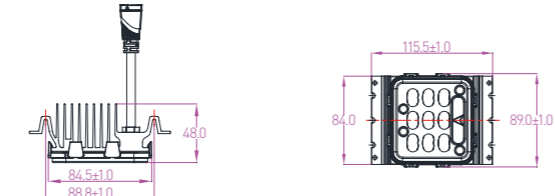
M35A-XC

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



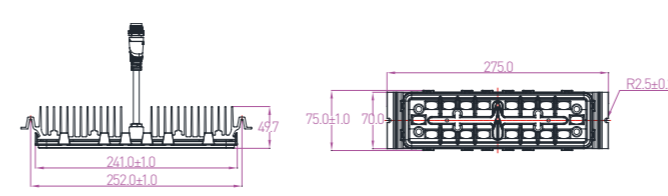
M6A-VA

LED package 3535
Max. power 30W
Typical system luminous efficacy 100lm/W



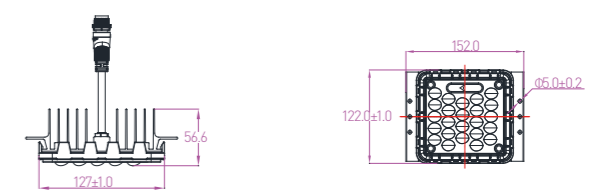
M8B-VC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



M12A-XB

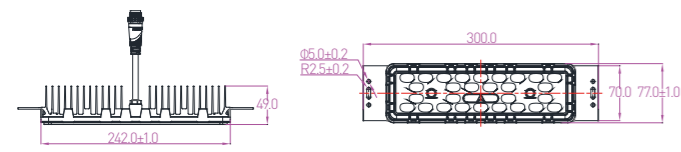
Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 140lm/W



MODULE COLLECTIONS OF TUNNEL LIGHT APPLICATIONS

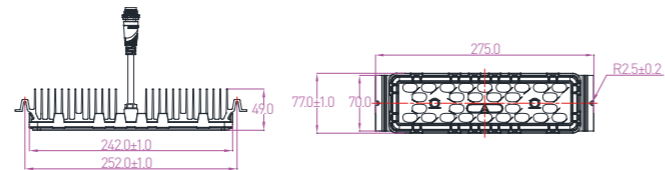
M16A-CB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 145lm/W



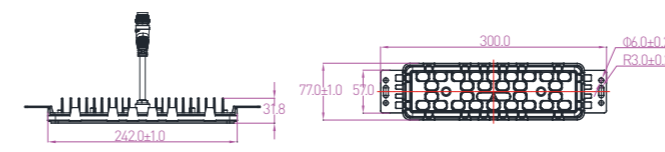
M16B-VB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 145lm/W



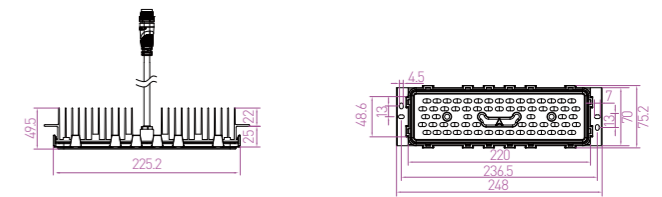
M20A-CB

Customized LEDs from a world-leading supplier
Max. power 40W
Typical system luminous efficacy 160lm/W



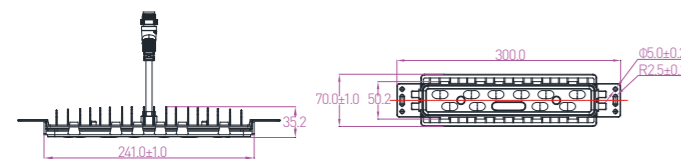
M35A-XC

LED package 3535
Max. power 60W
Typical system luminous efficacy 110lm/W



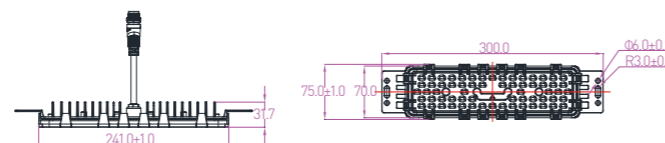
M18A-CB

Customized LEDs from a world-leading supplier
Max. power 40W
Typical system luminous efficacy 125lm/W



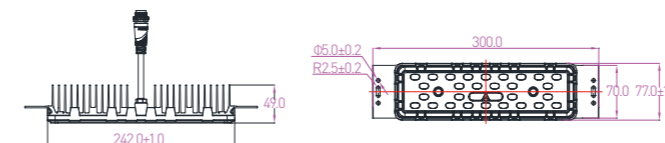
M19A-CC

LED package 3030
Max. power 40W
Typical system luminous efficacy 117lm/W



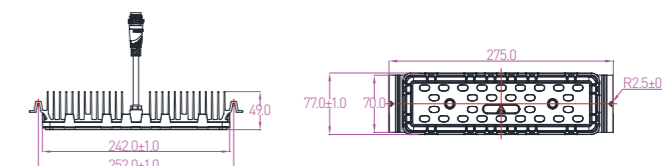
M28A-CA

LED package 3535
Max. power 60W
Typical system luminous efficacy 125lm/W



M28A-VA

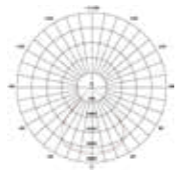
LED package 3535
Max. power 60W
Typical system luminous efficacy 125lm/W



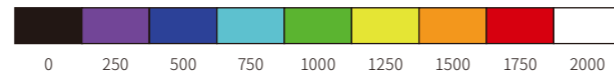
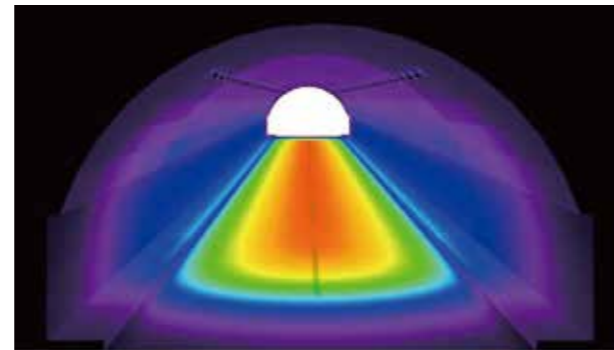
* The typical system luminous efficacy of M18A-CB is measured at the module's maximum power with 92% power efficiency.
* The typical system luminous efficacy of the modules other than M18A-CB is measured at the modules' maximum power with 92% power efficiency.

TUNNEL LIGHTING SETTINGS

Tunnel Scenario 1



#2190 90° beam angle
(50%) lighting distribution

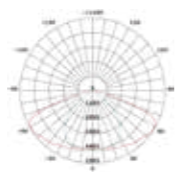


Tunnel conditions The tunnel's entrance section, one-way two lanes, road width 8m, two-side and symmetrical lamp arrangement, installation height 5.2m, installation spacing 2m.

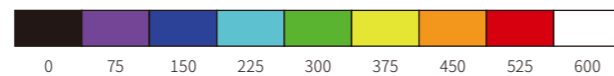
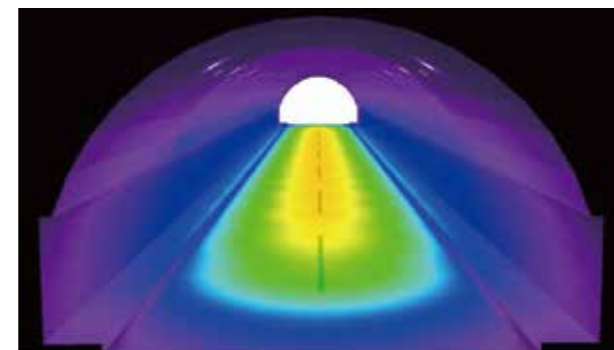
Product information M16B-VB module, lighting distribution #2190, power 100W, luminous efficacy 150lm/W.

Lighting effect Eav 1270lx, UE 0.940, Lav 67cd/m², Uo 0.94, UL 1.0.

Tunnel Scenario 2



#2105 IESNA Type II Short
(iso-brightness) lighting distribution

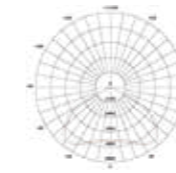


Tunnel conditions The tunnel's transition section, one-way two lanes, road width 8m, two-side and symmetrical lamp arrangement, installation height 5.2m, installation spacing 6m.

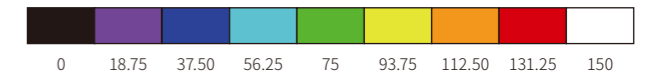
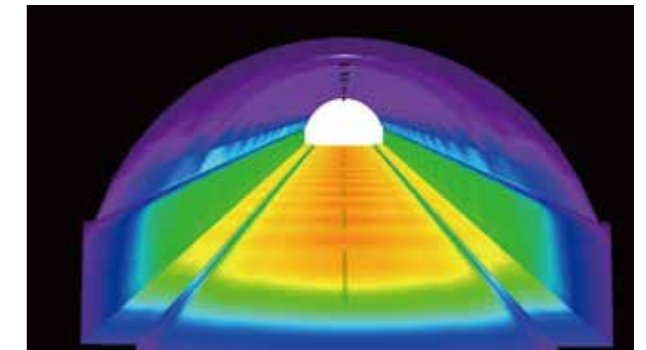
Product information M16B-VB module, lighting distribution #2105, power 80W, luminous efficacy 150lm/W.

Lighting effect Eav 319lx, UE 0.916, Lav 20cd/m², Uo 0.92, UL 0.99.

Tunnel Scenario 3



#1010 110° beam angle
(50%) lighting distribution

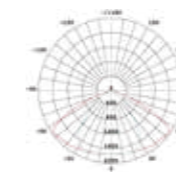


Tunnel conditions The tunnel's basic section, one-way two lanes, road width 8m, ceiling lamp arrangement, installation height 5.2m, installation spacing 2m.

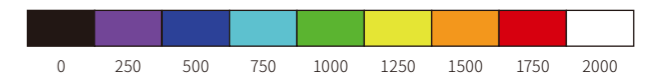
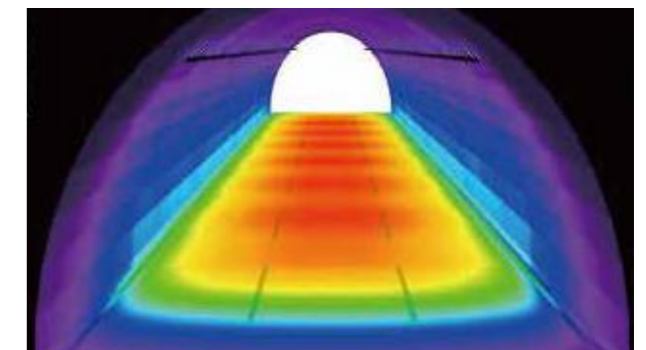
Product information M1A-VA module, lighting distribution #1010, power 80W, luminous efficacy 110lm/W.

Lighting effect Eav 99lx, UE 0.938, Lav 4.87cd/m², Uo 0.90, UL 0.96.

Tunnel Scenario 4



#3010 tunnel
lighting distribution



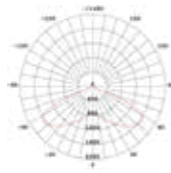
Tunnel conditions The tunnel's entrance section, one-way three lanes, road width 11m, two-side and symmetrical lamp arrangement, height of installation 5.5m, installation spacing 2m.

Product information M1A-VA module, lighting distribution #3010, power 180W, luminous efficacy 110lm/W.

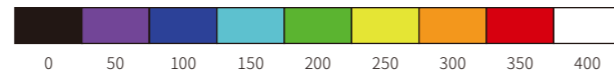
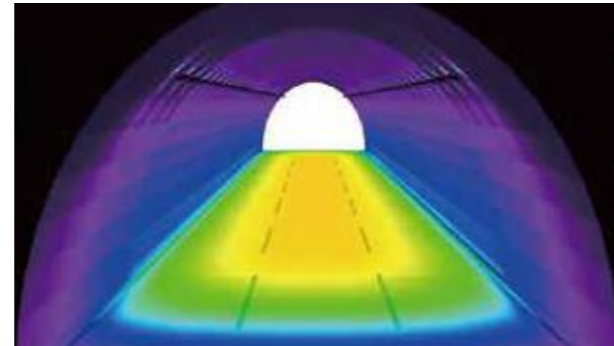
Lighting effect Eav 1447lx, UE 0.962, Lav 71cd/m², Uo 0.93, UL 0.99.

TUNNEL LIGHTING SETTINGS

Tunnel Scenario 5



#1616 tunnel lighting distribution

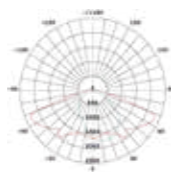


Tunnel conditions The tunnel's transition section, one-way three lanes, road width 11m, two-side and symmetrical lamp arrangement, installation height 5.5m, installation spacing 3m.

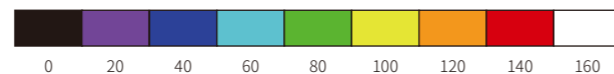
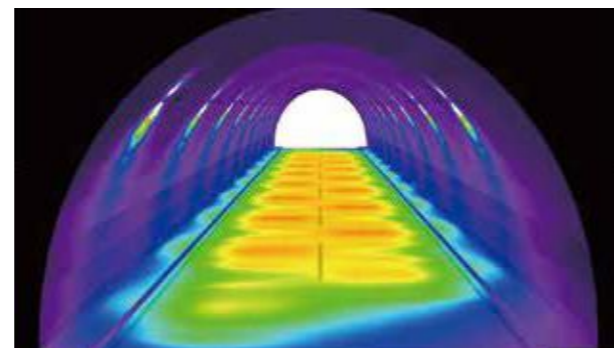
Product information M6A-VA module, lighting distribution #1616, power 60W, luminous efficacy 100lm/W.

Lighting effect E_{av} 244lx, UE 0.947, L_{av} 15cd/m², U_o 0.93, UL 0.97.

Tunnel Scenario 6



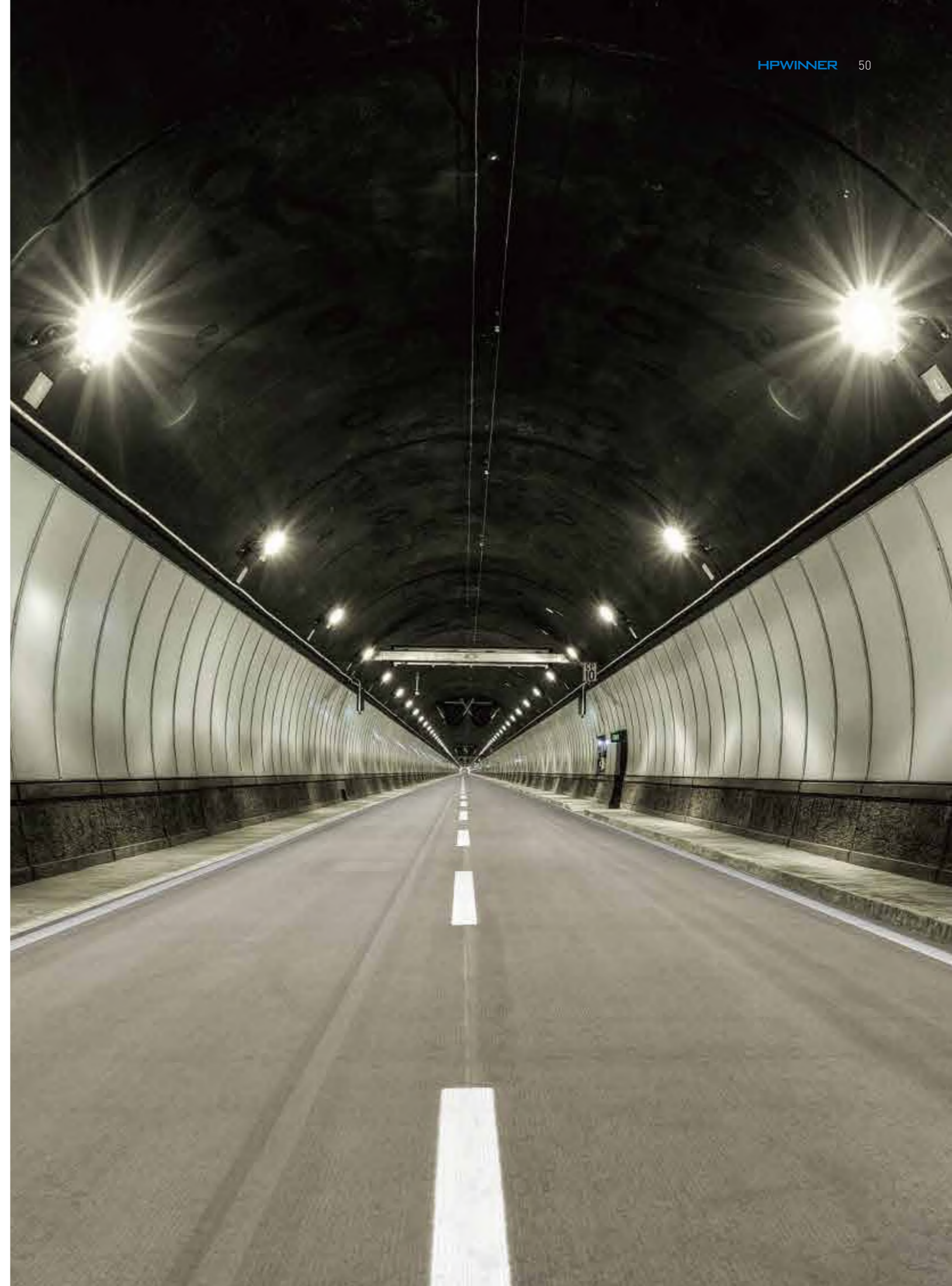
#2322 IESNA Type II Short Vertical (iso-brightness) lighting distribution



Tunnel conditions The tunnel's basic section, one-way two lanes, road width 8m, two-side and stagger lamp arrangement, installation height 5.2m, installation spacing 10m.

Product information M8B-VC module, lighting distribution #2322, power 60W, luminous efficacy 120lm/W.

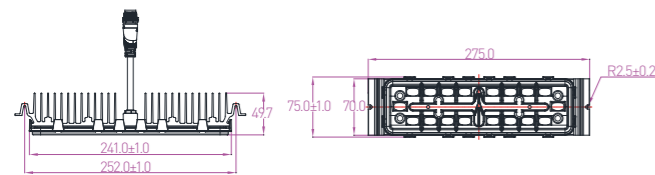
Lighting effect E_{av} 102lx, UE 0.891, L_{av} 6.53cd/m², U_o 0.90, UL 0.97.



PRODUCT COLLECTIONS OF SPORTS COMPLEX LIGHTING APPLICATIONS

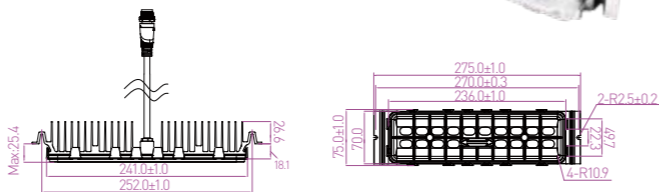
M1A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



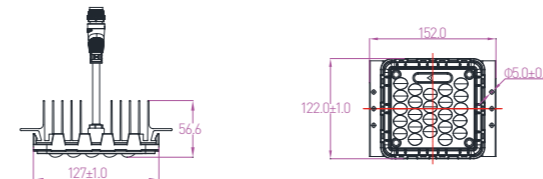
M2A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



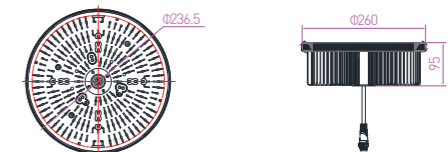
M12A-XB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 140lm/W



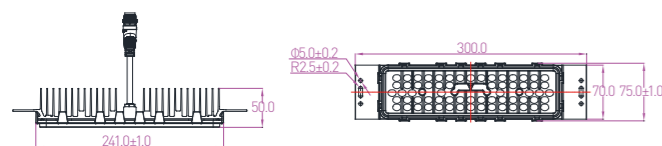
M15D-XB

Customized LEDs from a world-leading supplier
Max. power 200W
Typical system luminous efficacy 145lm/W



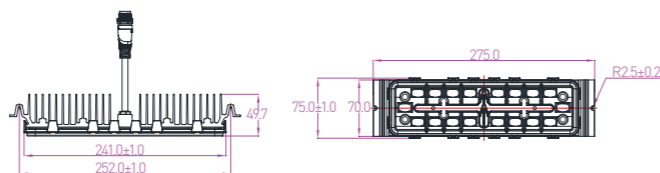
M8A-CC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



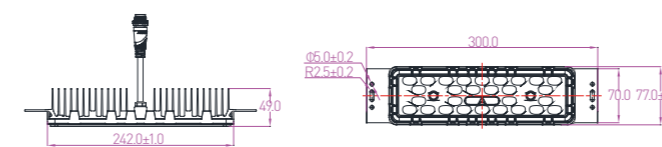
M8B-VC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



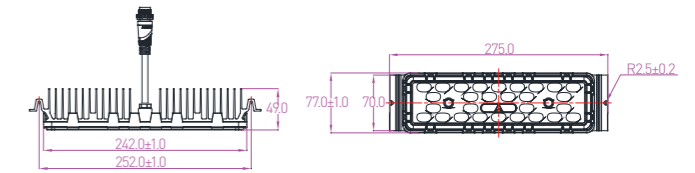
M16A-CB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 145lm/W



M16B-VB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 145lm/W

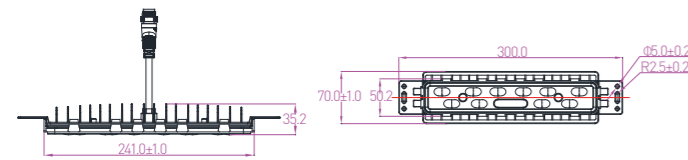


PRODUCT COLLECTIONS OF SPORTS COMPLEX LIGHTING APPLICATIONS



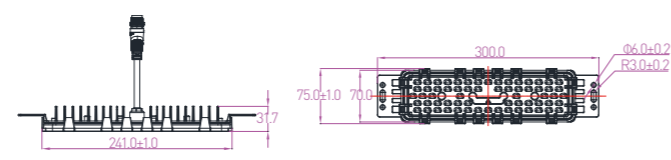
M18A-CB

Customized LEDs from a world-leading supplier
Max. power 40W
Typical system luminous efficacy 125lm/W



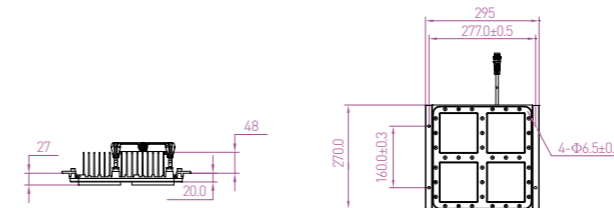
M19A-CC

LED package 3030
Max. power 40W
Typical system luminous efficacy 117lm/W



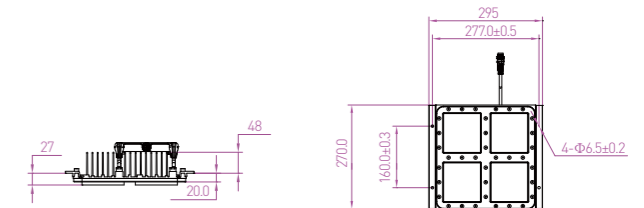
M25A-XA

LED package 3535
Max. power 250W
Typical system luminous efficacy 102lm/W



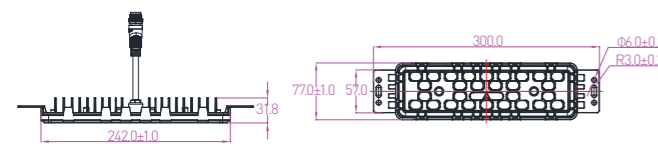
M25A-XB

Customized LEDs from a world-leading supplier.
Max. power 250W
Typical system luminous efficacy 130lm/W



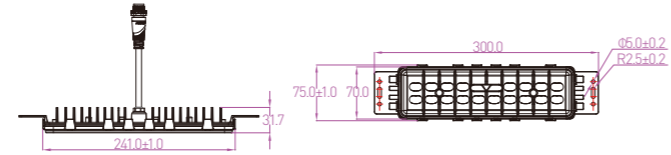
M20A-CB

Customized LEDs from a world-leading supplier
Max. power 40W
Typical system luminous efficacy 160lm/W



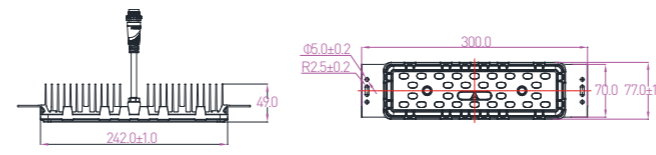
M21A-CA

LED package 3535
Max. power 40W
Typical system luminous efficacy 110lm/W



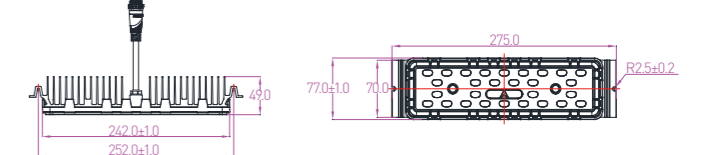
M28A-CA

LED package 3535
Max. power 60W
Typical system luminous efficacy 125lm/W



M28A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 125lm/W

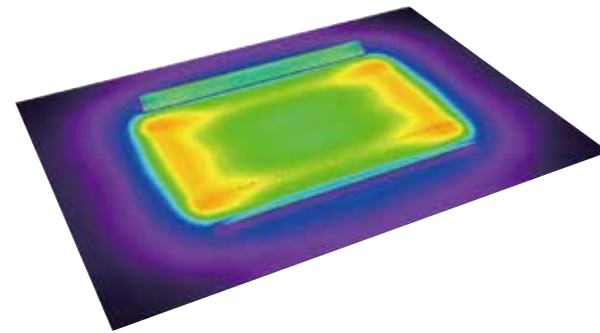
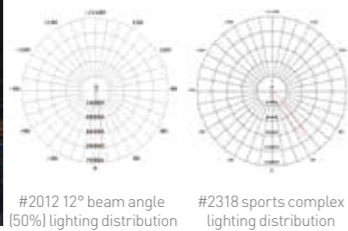


*The typical system luminous efficacy of M18A-CB is measured at the module's maximum power with 92% power efficiency.

*The typical system luminous efficacy of the modules other than M18A-CB is measured at the modules' maximum power with 92% power efficiency.

SCENARIOS OF SPORTS COMPLEX LIGHTING APPLICATIONS

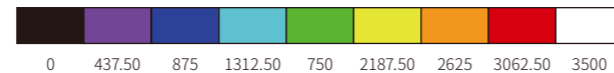
Scenario of football field



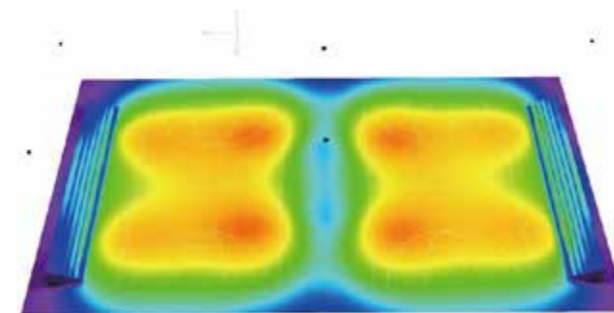
Conditions of football field Length 105m, width 68m, mixed arrangement, installation height: 20m.

Product solutions M12A-XA module, lighting distribution #2012/2318, power 1000W, luminous efficacy 110lm/W.

Lighting effect E_{av}: 2029lx, U_h 0.84, GR ≤ 50.



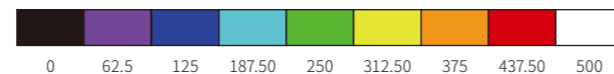
Scenario of Basketball Court



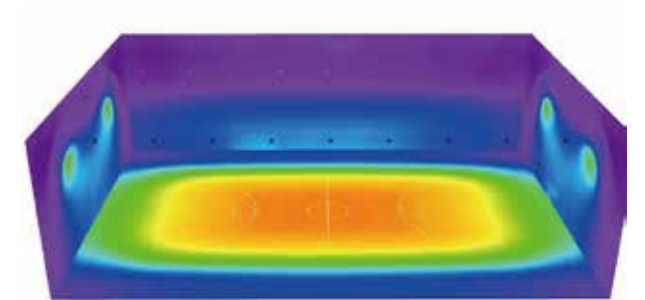
Conditions of Basketball Court Length 28m, width 15m, symmetrical arrangement on the sideline of the court, installation height: 12m

Product solutions M8B-VC module, lighting distribution #2360, power 300W, luminous efficacy 105lm/W.

Lighting effect E_{av} 332lx, U_h 0.75, GR ≤ 30.



Scenario of Basketball Court



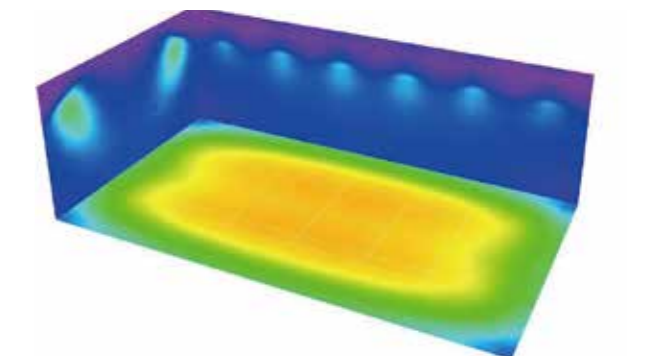
Conditions of Basketball Court Length 28m, width 15m, symmetrical lamp arrangement on the sideline of the court, installation height: 10m

Product solutions M16B-VB module, lighting distribution #2212, power 200W, luminous efficacy 150lm/W.

Lighting effect E_{av} 581lx, U_h 0.86, GR ≤ 30.



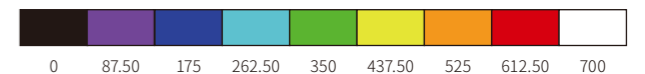
Scenario of indoor Tennis Stadium



Conditions of tennis Stadium Length 36m, width 18m, symmetrical lamp arrangement on the sidelines of the court, installation height: 12m

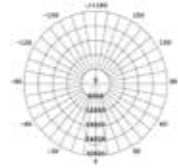
Product solutions M16B-VB module, lighting distribution #3160, power 250W, luminous efficacy 150lm/W.

Lighting effect E_{av} 513lx, U_h 0.81, GR ≤ 30.

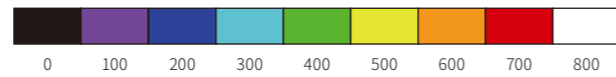
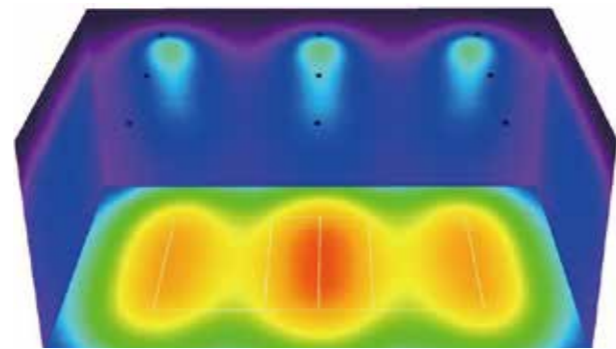


SCENARIOS OF SPORTS COMPLEX LIGHTING APPLICATIONS

Scenario of Volleyball Court



#3140 40° beam angle (50%) lighting distribution

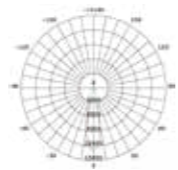


Conditions of Volleyball Court Length 180m, width 90m, installation height: 9m.

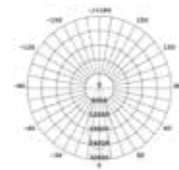
Product information M16B module, lighting distribution #3140, power 250W, luminous efficacy 150lm/W.

Lighting effect E_{av} 562lx, U_h 0.83, $GR \leq 30$.

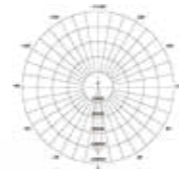
Scenario of Golf Course



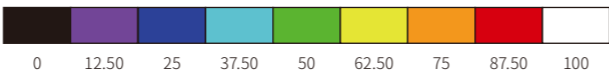
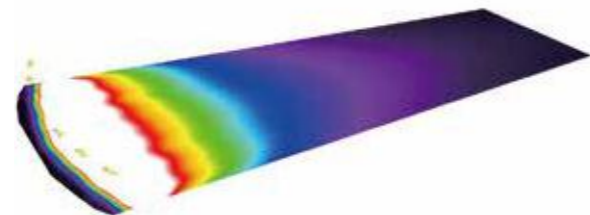
#3125 25° beam angle (50%) lighting distribution



#3140 40° beam angle (50%) lighting distribution



#1908 12° beam angle (50%) lighting distribution



Conditions of Golf Course Length 180m, Width 90m, Installation height 9m.

Product information M1A-VA module, lighting distribution #1908, power 200W, luminous efficacy 110lm/W; M16B-VB module, lighting distribution #3125/3140, power 200W, luminous efficacy 150lm/W.

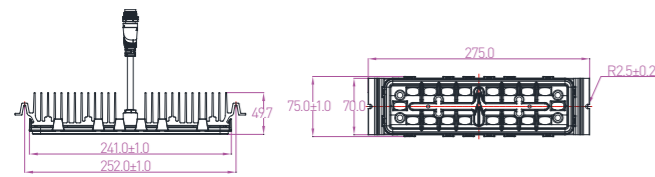
Lighting effect 5m in front of the driving range, E_v 154lx, 180m in front of the driving range, E_v 70lx.



PRODUCT COLLECTIONS OF INDUSTRIAL PLANT LIGHTING APPLICATIONS

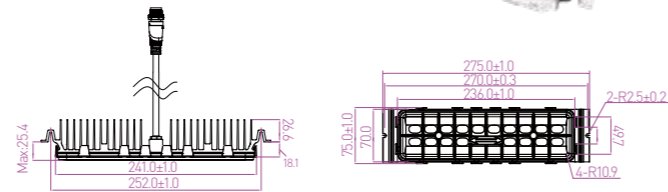
M1A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



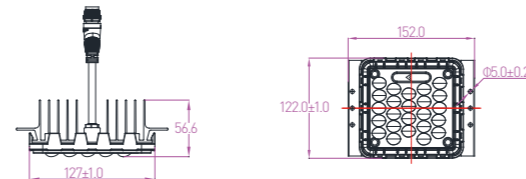
M2A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



M12A-XB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 140lm/W



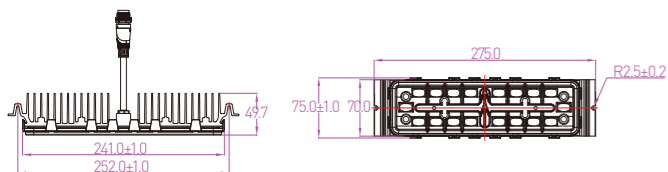
M15D-XB

Customized LEDs from a world-leading supplier
Max. power 200W
Typical system luminous efficacy 145lm/W



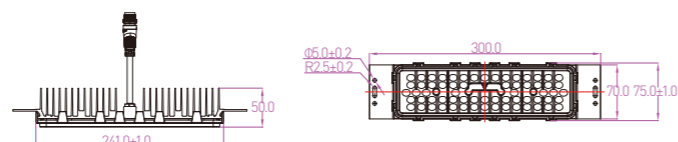
M8B-VC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



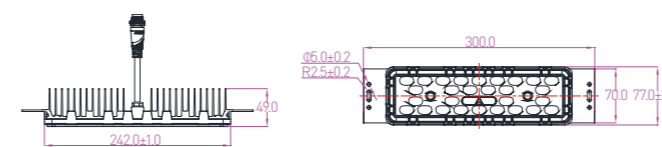
M8A-CC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



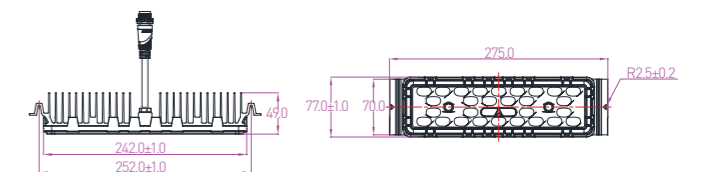
M16A-CB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 145lm/W



M16B-VB

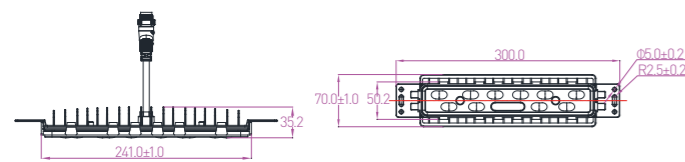
Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 145lm/W



PRODUCT COLLECTIONS OF INDUSTRIAL PLANT LIGHTING APPLICATIONS

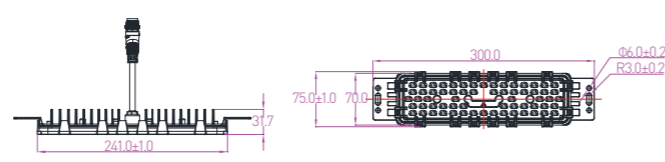
M18A-CB

Customized LEDs from a world-leading supplier
Max. power 40W
Typical system luminous efficacy 125lm/W



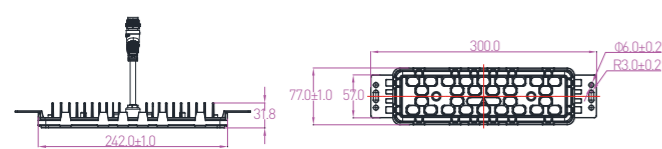
M19A-CC

LED package 3030
Max. power 40W
Typical system luminous efficacy 117lm/W



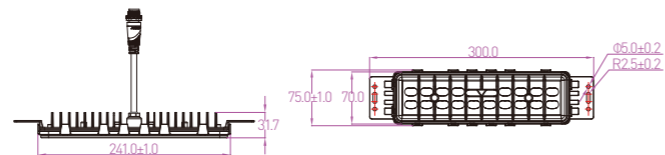
M20A-CB

Customized LEDs from a world-leading supplier
Max. power 40W
Typical system luminous efficacy 160lm/W



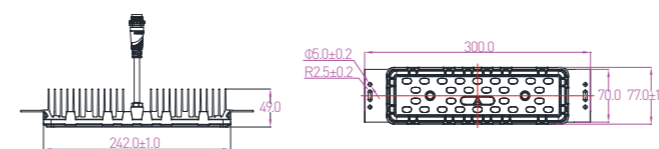
M21A-CA

LED package 3535
Max. power 40W
Typical system luminous efficacy 110lm/W



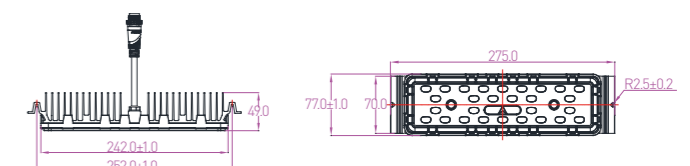
M28A-CA

LED package 3535
Max. power 60W
Typical system luminous efficacy 125lm/W



M28A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 125lm/W

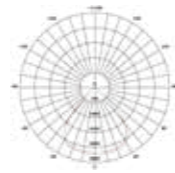


* The typical system luminous efficacy of M18A-CB is measured at the module's maximum power with 92% power efficiency.

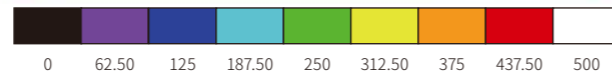
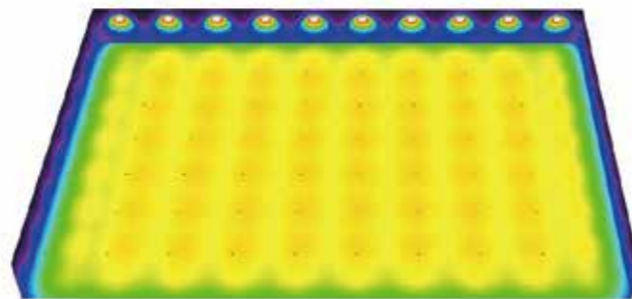
* The typical system luminous efficacy of the modules other than M18A-CB is measured at the modules' maximum power with 92% power efficiency.

SCENARIOS OF INDUSTRIAL PLANT LIGHTING APPLICATIONS

Industrial Plant Scenario 1



#2190 90° beam angle (50%) lighting distribution

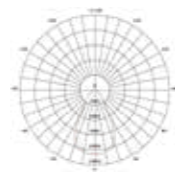


Conditions of Industrial Plant Length: 180m, width: 60m, installation height: 9m, installing spacing: 8m.

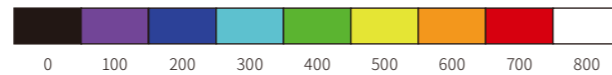
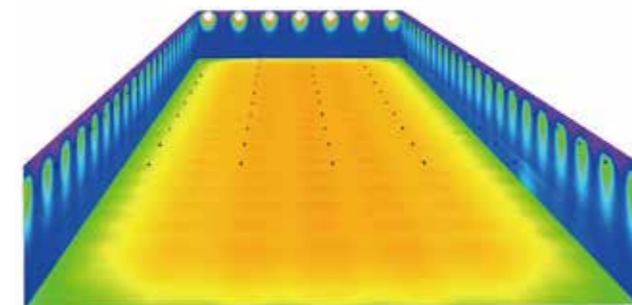
Product information M16B-VB module, lighting distribution #2190, power 180W, luminous efficacy 145lm/W.

Lighting effect Eav 323lx, Uo 0.901.

Industrial Plant Scenario 2



#3160 60° beam angle (50%) lighting distribution

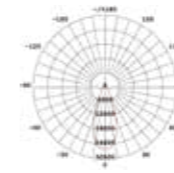


Conditions of Industrial Plant Length: 100m, width: 30m, installation height: 7m, installing spacing: 4m.

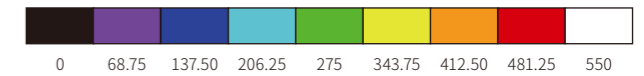
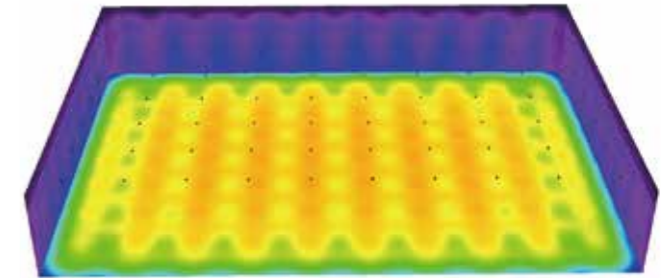
Product information M16B-VB module, lighting distribution #3160, power 80W, luminous efficacy 150lm/W.

Lighting effect Eav 575lx, Uo 0.925.

Industrial Plant Scenario 3



#3540 40° beam angle (50%) lighting distribution

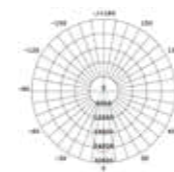


Conditions of Industrial Plant Length: 90m, width: 60m, installation height: 15m, installing spacing: 8m.

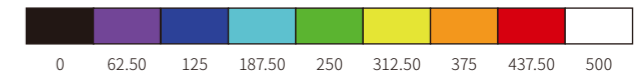
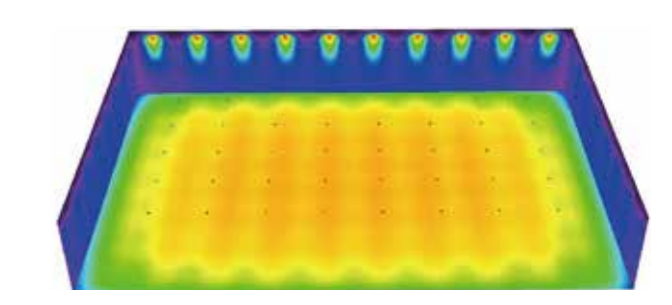
Product information M2A-VA module, lighting distribution #3540, power 300W, luminous efficacy 100lm/W.

Lighting effect Eav 368lx, Uo 0.843.

Industrial Plant Scenario 4



#3140 40° beam angle (50%) lighting distribution



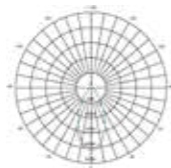
Industrial Plant Conditions Length: 90m, width: 60m, installation height: 12m, installing spacing: 8m.

Product information M16B-VB module, lighting distribution #3140, power 200W, luminous efficacy 150lm/W.

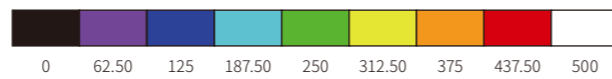
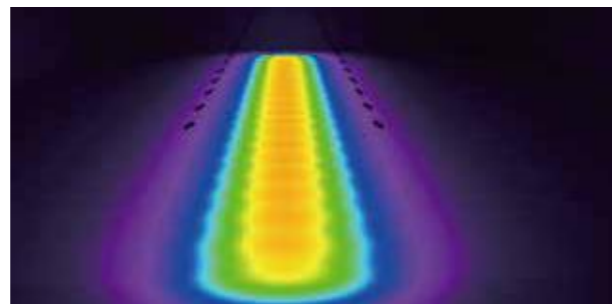
Lighting effect Eav 342lx, Uo 0.867.

MODULE COLLECTIONS OF INDUSTRIAL LIGHTING APPLICATIONS

Industrial Plant Scenario 5



#1560 60° beam angle (50%) lighting distribution

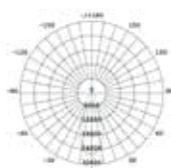


Industrial Plant Conditions Length: 100m, width: 50m, installation height: 5m, installation spacing: 3.5m.

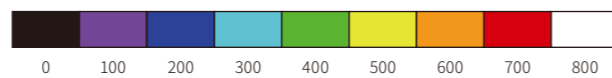
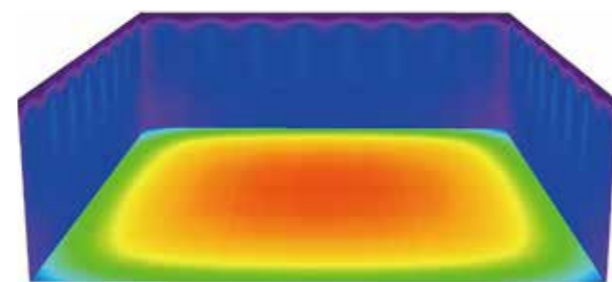
Product solutions Luminaire Information: M1A-VA module, lighting distribution #1560, power 50W, luminous efficacy 100lm/W

Lighting effect EAV 368lx, U₀ 0.843

Industrial Plant Scenario 6



#3140 40° beam angle (50%) lighting distribution



Industrial Plant Conditions Length: 80m, width: 80m, installation height: 26m, installation spacing: 8m.

Luminaire Information M16B-VB module, lighting distribution #3140, power 480W, luminous efficacy 145lm/W

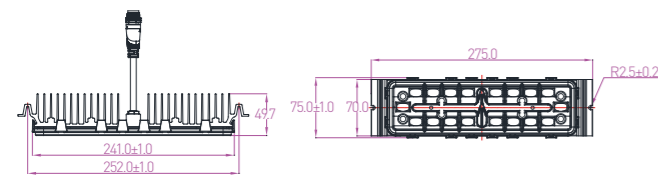
Lighting effect EAV 348lx, U₀ 0.753



PRODUCT COLLECTIONS OF AIRPORT & PORT & SQUARE LIGHTING

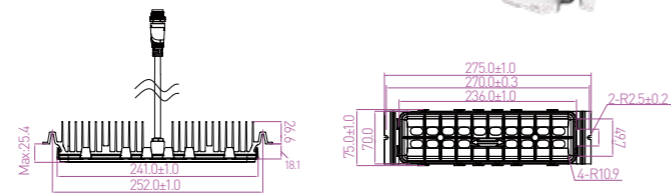
M1A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



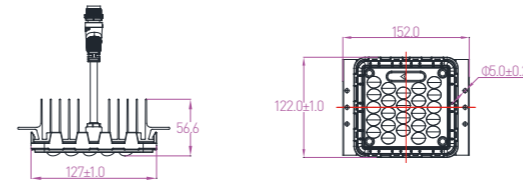
M2A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



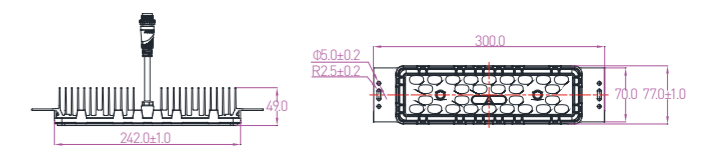
M12A-XB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 140lm/W



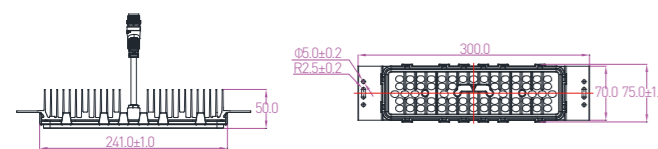
M16A-CB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 145lm/W



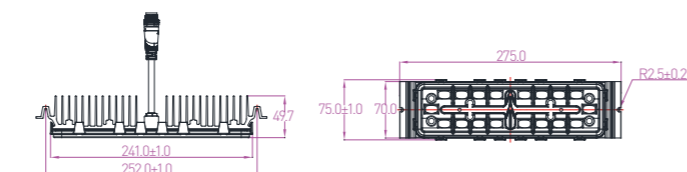
M8A-CC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



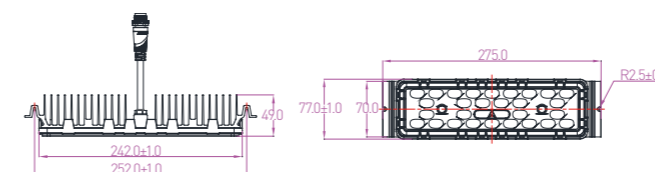
M8B-VC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



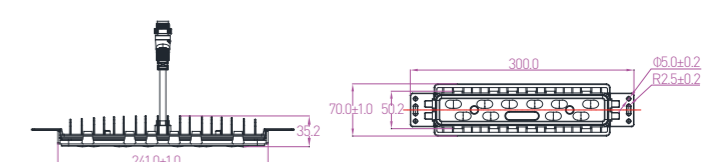
M16B-VB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 145lm/W



M18A-CB

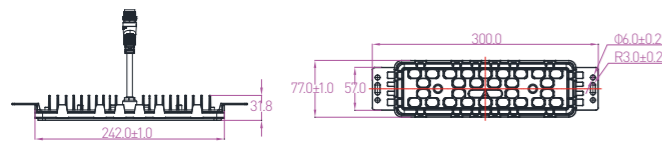
Customized LEDs from a world-leading supplier
Max. power 40W
Typical system luminous efficacy 125lm/W



PRODUCT COLLECTIONS OF AIRPORT & PORT & SQUARE LIGHTING

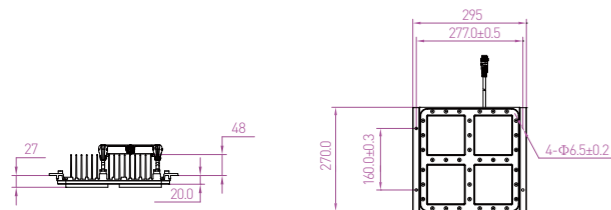
M20A-CB

Customized LEDs from a world-leading supplier
Max. power 40W
Typical system luminous efficacy 160lm/W



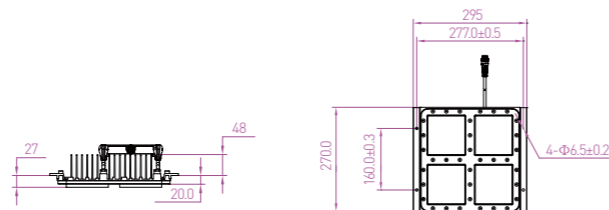
M25A-XA

LED package 3535
Max. power 250W
Typical system luminous efficacy 102lm/W



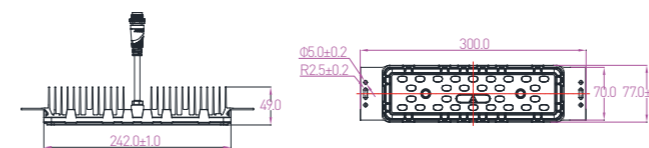
M25A-XB

Customized LEDs from a world-leading supplier.
Max. power 250W
Typical system luminous efficacy 130lm/W



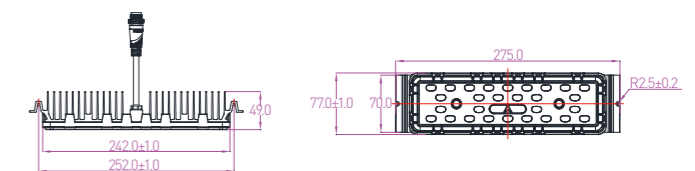
M28A-CA

LED package 3535
Max. power 60W
Typical system luminous efficacy 125lm/W



M28A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 125lm/W



* The typical system luminous efficacy of M18A-CB is measured at the module's maximum power with 92% power efficiency.
* The typical system luminous efficacy of the modules other than M18A-CB is measured at the modules' maximum power with 92% power efficiency.

SCENARIOS OF AIRPORT & PORT & SQUARE LIGHTING

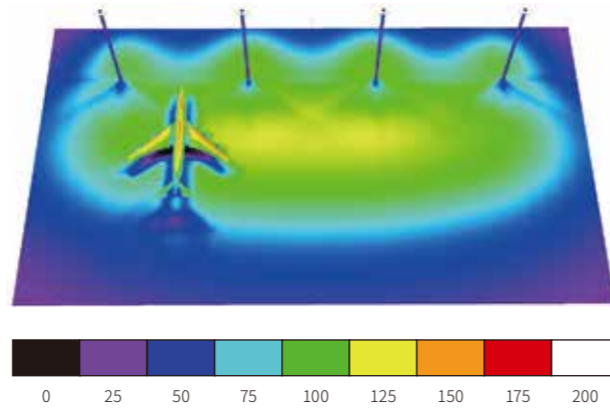
Airport



Airport Conditions Length 167m, width 95m, installation height 35m.

Product information M16B-VB module, lighting distribution #3160, power 400W, luminous efficacy 150lm/W.

Lighting effect E_{av} 80lx, U_e 0.703.



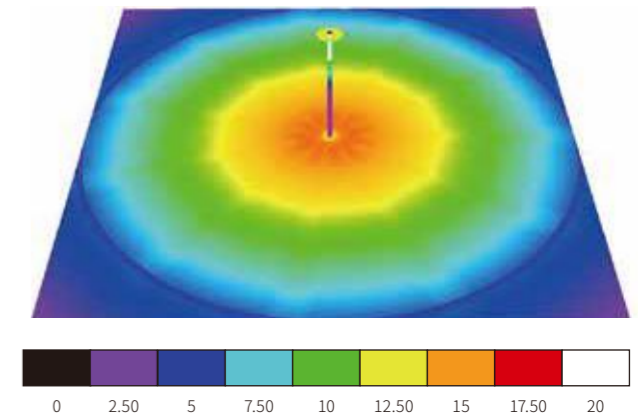
Square scenario 1



Square conditions Length 60m, width 60m, installation height 30m.

Product information M1A-VA module, lighting distribution #3040, power 200W, luminous efficacy 110lm/W.

Lighting effect E_{av} 10lx, U_e 0.661.



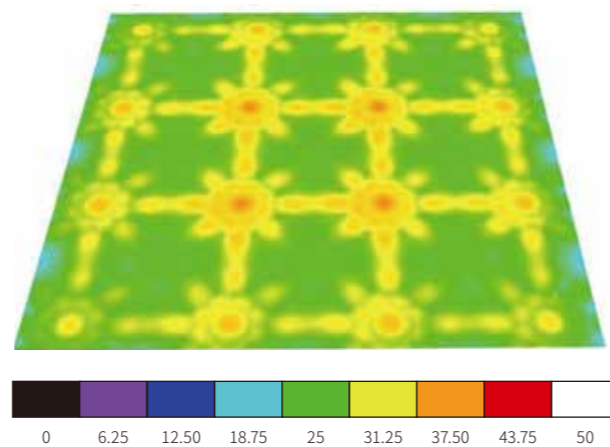
Port



Port conditions Length 360m, width 340m, installation height 30m.

Product information M8B-VC module, lighting distribution #5340, power 360W, luminous efficacy 120lm/W.

Lighting effect E_{av} 30lx, U_e 0.728.



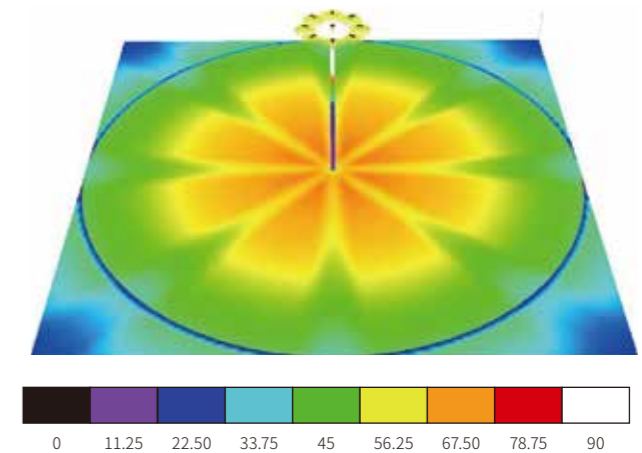
Square scenario 2



Square conditions length 60m, width 60m, installation height 20m

Product information M1A-VA module, lighting distribution #3040, power 400W, luminous efficacy 110lm/W.

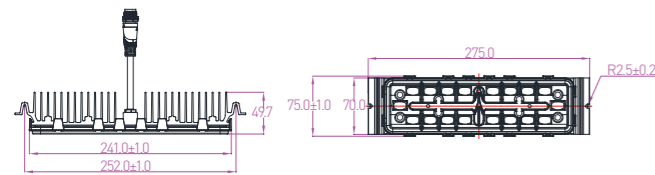
Lighting effect E_{av} 53lx, U_e 0.705.



PRODUCT COLLECTIONS OF OTHER PROJECTION LIGHTING

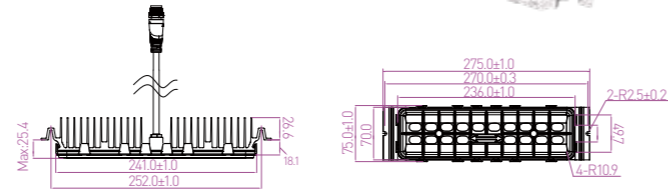
M1A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



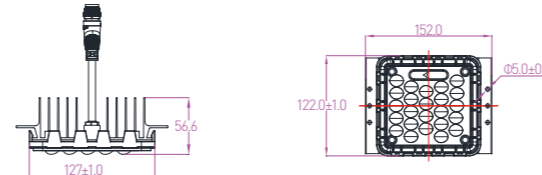
M2A-VA

LED package 3535
Max. power 60W
Typical system luminous efficacy 100lm/W



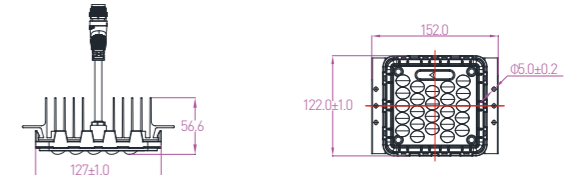
M12A-XA

LED package 3535
Max. power 60W
Typical system luminous efficacy 103lm/W



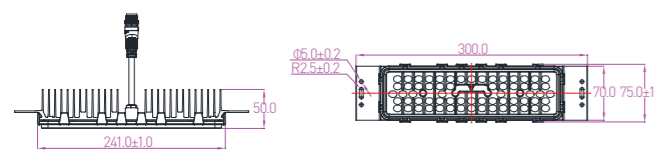
M12A-XB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 140lm/W



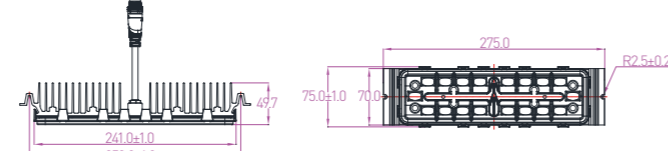
M8A-CC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



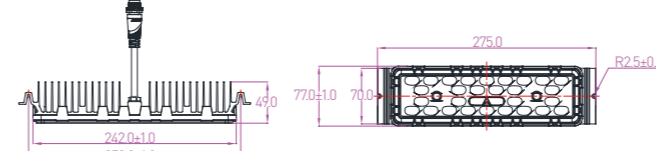
M8B-VC

LED package 3030
Max. power 60W
Typical system luminous efficacy 117lm/W



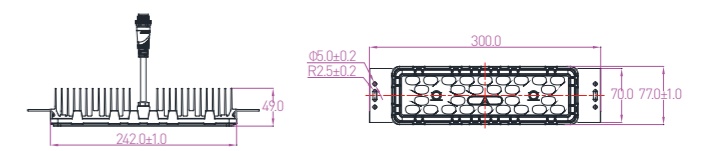
M16B-VB

Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 145lm/W



M16A-CB

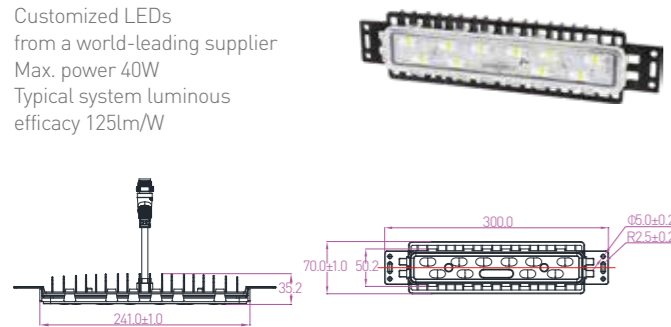
Customized LEDs from a world-leading supplier
Max. power 60W
Typical system luminous efficacy 145lm/W



PRODUCT COLLECTIONS OF OTHER PROJECTION LIGHTING

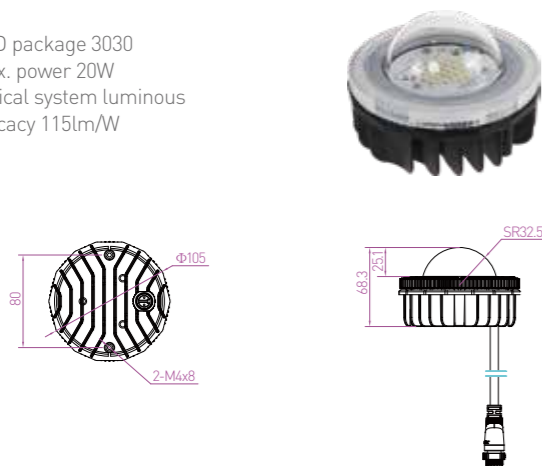
M18A-CB

Customized LEDs from a world-leading supplier
 Max. power 40W
 Typical system luminous efficacy 125lm/W



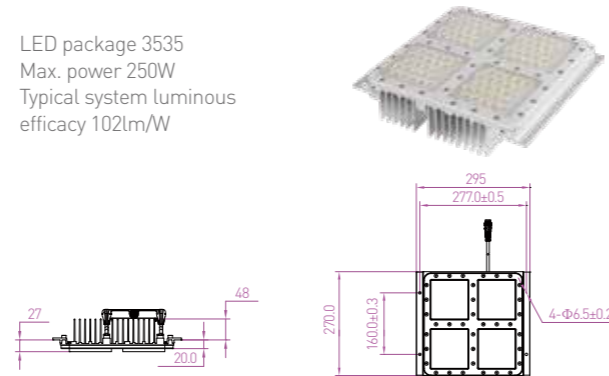
M23A-XC

LED package 3030
 Max. power 20W
 Typical system luminous efficacy 115lm/W



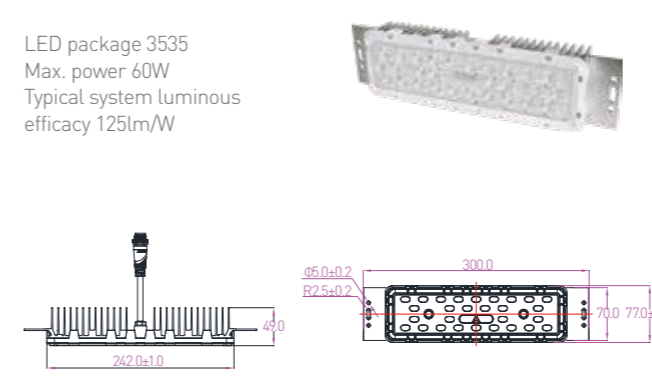
M25A-XB

LED package 3535
 Max. power 250W
 Typical system luminous efficacy 102lm/W



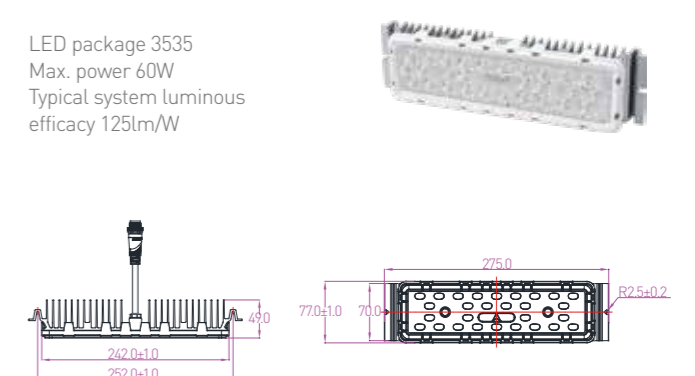
M28A-CA

LED package 3535
 Max. power 60W
 Typical system luminous efficacy 125lm/W



M28A-VA

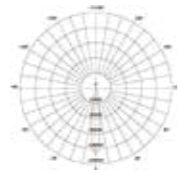
LED package 3535
 Max. power 60W
 Typical system luminous efficacy 125lm/W



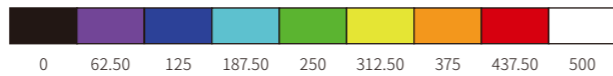
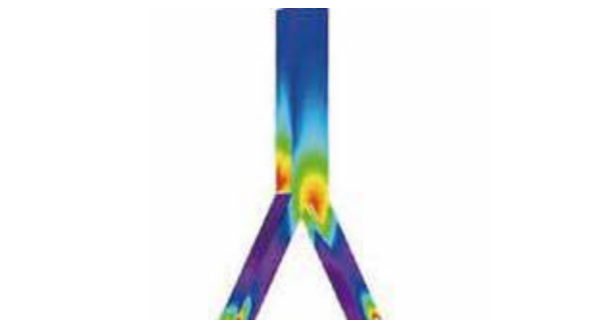
* The typical system luminous efficacy of M18A-CB is measured at the module's maximum power with 92% power efficiency.
 * The typical system luminous efficacy of the modules other than M18A-CB is measured at the modules' maximum power with 92% power efficiency.

OTHER SCENARIOS OF PROJECTION LIGHTING

Bridge scenario



#1908 12° beam angle (50%) lighting distribution

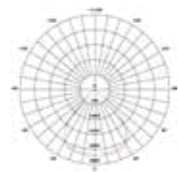


Industrial plant conditions Main tower height 148m.

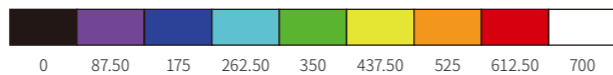
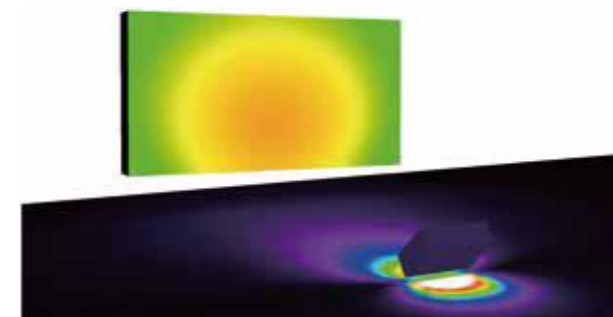
Product information M1A-VA module, lens #1908, power 400W, luminous efficacy 150lm/W.

Lighting effect E_{av} 80lx, U_e 0.703.

Billboard scenario



#2190 90° beam angle (50%) lighting distribution

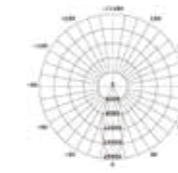


Square conditions Length 1.8m, width 1.0m, billboard installation height 0.6m.

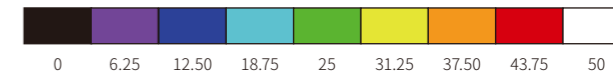
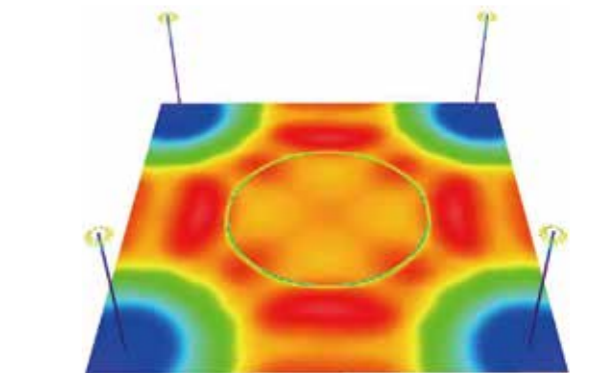
Product solutions M16B-VB module, light distribution #2190, power 40W, luminous efficacy 150lm/W.

Lighting effect E_{av} 387lx, U_e 0.741.

Crossroad case



#5340 40° beam angle (50%) lighting distribution

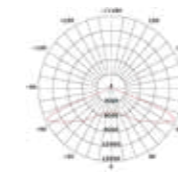


Cross roadway conditions Length 50m, width 50m, installation height 33m.

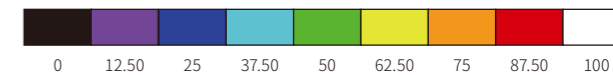
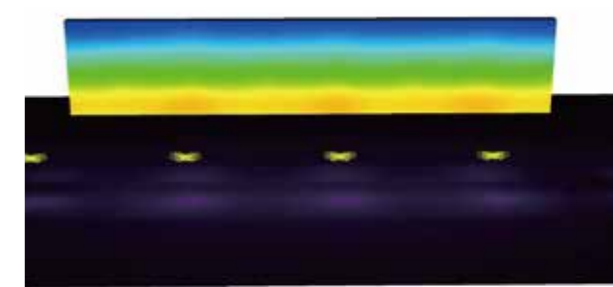
Product information M8B-VC module, lens #5340, power 250W, luminous efficacy 120lm/W.

Lighting effect E_{av} 38lx, U_e 0.933.

Exterior wall scenario



#1810 IESNA Type I Short (batwing) lighting distribution



Exterior wall conditions Exterior wall height 16m, installation height 3.5m, installation spacing 15m.

Product information M1A-VA module, lighting distribution #1810, power 80W, luminous efficacy 110lm/W.

Lighting effect E_{av} 48lx, U_e 0.525.

CASE STUDIES



JAÉN, SPAIN THE FIRST WHOLE-CITY REPLACEMENT PROJECT IN EUROPE

Jaén, Spain

It was the first full-city LED replacement project in the Continental Europe. In this project, over 20,000 outdoor lamps were replaced, and the comprehensive energy saving rate exceeded 70%. More than ten types of lighting distribution plans were applied to achieve uniform lighting effect and reduce light pollution.



BRAZIL WORLD CUP STREET LIGHT PROJECT & UNIVERSITY OF SÃO PAULO PROJECT

Sao Paulo City, Brazil

It was a street lamp replacement project of the main road from São Paulo International Airport to downtown. This project lit up the 23-mile Avenue to the World Cup stadium.

More than 13,000 traditional street lamps were replaced. With uniform illumination, this project made the journey from the airport to the stadium for the World Cup opening ceremony a perfect experience.



G20 HANGZHOU SUMMIT



Hangzhou city, Zhejiang province, China

LED street lamp replacement project of the roads around the venue for Hangzhou G20 Summit.

We adopted various lighting distribution plans and lamps with different power according to different road conditions. Uniform and highly-efficient illumination guaranteed traffic safety, which was our unique contribution to this big event.



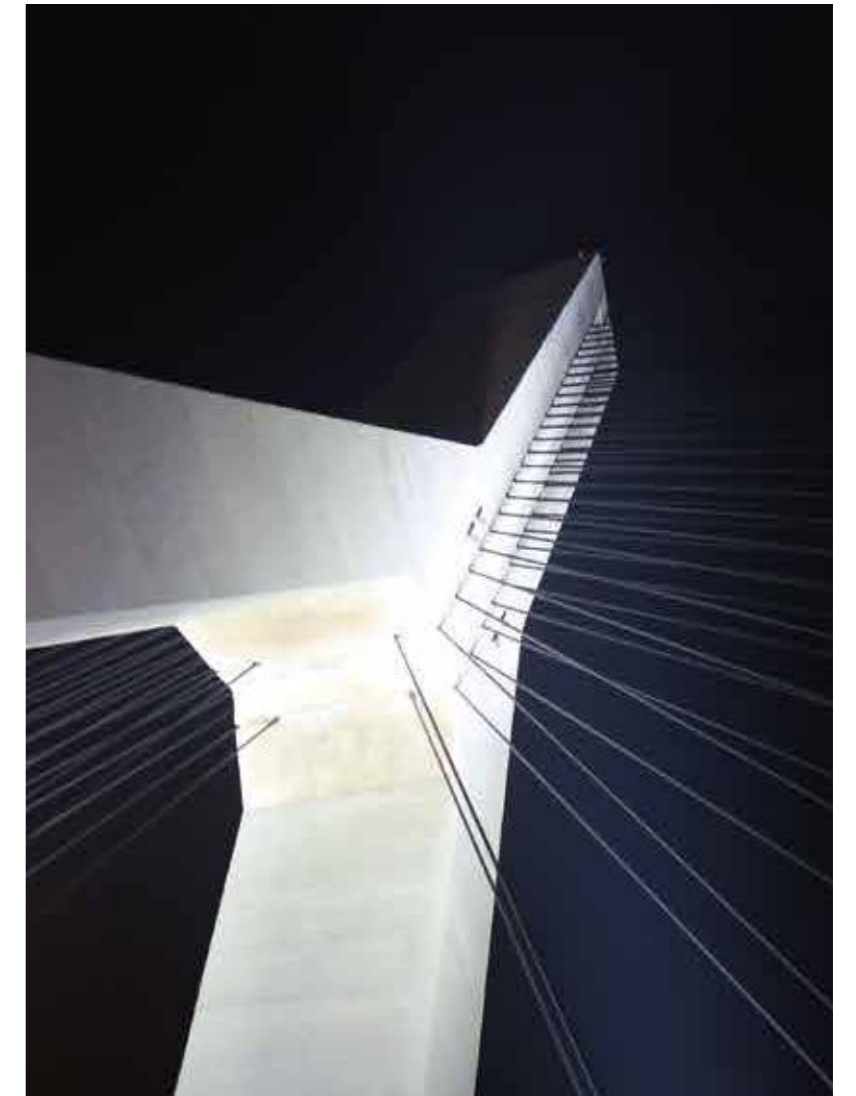
EAST CHINA SEA BRIDGE PROJECT

Before Replacement

The bridge tower is over 100m high over the bridge. The original 1000W metal halide lamps with narrow optical beam could barely light up the tower top.

Retrofit Solution

In order to improve the visual effect of the tower top, we adopted new LED floodlights with 12° beam angle lighting distribution and 280W power to replace the old lamp. The uniform illumination guaranteed drivers' safety, which made this sea bridge sparkle with new vitality.



GUANGZHOU INTERNATIONAL CONVENTION AND EXHIBITION CENTER

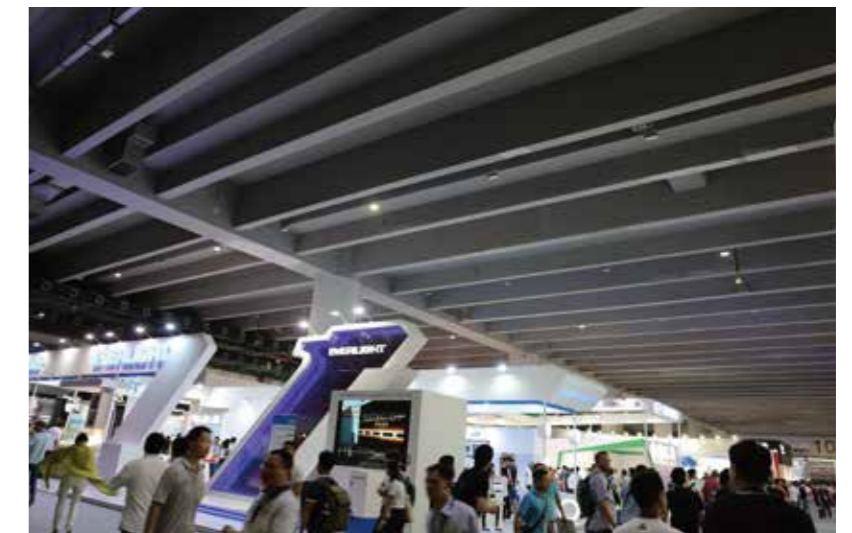


Before Replacement

Originally, the Guangzhou International Convention and Exhibition Center adopted 250W metal halide lamps, which caused huge energy consumption.

Retrofit Solution

We replaced all the metal halide lamps with LED high bay lights. The power of these lights was only 80W, and their fractional energy saving rate exceeded 70%. We achieved the goal of sustainability and energy conservation. After redesigning the lighting distribution, both the illuminance on the ground and the light uniformity gained a significant improvement, and the lighting performance became much better.



HOKKAIDO GOLF DRIVING RANGE

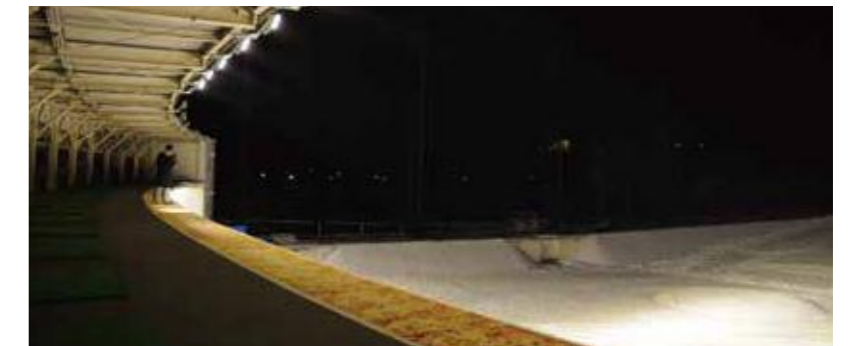


Before Replacement

The largest golf driving range in Hokkaido, Japan, originally used traditional 1000W floodlights. But the lighting effect was not good, and the stray light caused light pollution to its surroundings. The driving range's operation at night was greatly limited.

Retrofit Solution

We controlled the power of each LED light within 100~400W and minimized the number of lights. Finally, the fractional energy saving rate surpassed 70%. Accurate lighting distribution collected all the light inside the course, therefore the problem of stray light was completely solved.



RETROFIT PROJECT OF TUNNEL COMPLEX IN SICHUAN PROVINCE

Before Replacement

The tunnels in Sichuan province originally used 150W-400W high pressure sodium lamps. The lighting effect was poor, and vision problems like glare posed a threat to driving safety.

Retrofit Solution

We replaced all the 35,000 tunnel lights with new 40W-200W LED tunnel lights. The fractional energy saving rate exceeded 60%. With accurate lighting distribution design, the average illuminance on the tunnel ground had been significantly improved, and the problem of glare was completely solved. Driving safety was guaranteed and visual comfort improved.



REPLACEMENT PROJECT OF HANGZHOU XIAOSHAN INTERNATIONAL AIRPORT



Before Replacement

Hangzhou Xiaoshan International Airport originally used the 1000W high pressure sodium lamps on the parking aprons. The lighting effect was ordinary, yet the energy consumption was huge.

Retrofit Solution

HPWINNER had the honor to be among the airport's first batch of partners. We replaced more than 20 high-mast lamps with 400W LED flood lights. Thanks to the accurate lighting distribution design, we achieved energy efficiency and good lighting effect at the same time. We also guaranteed safe flights at night in low visibility conditions. The project enjoyed a good reputation ever since.

