



MASTERING LED COOLING

MTx
MechaTronix

An introduction

MechaTronix was formed in 2007, comprised of five already successful manufacturing companies, with each of them in excess of a decade of continuous operation. MechaTronix provides a wide variety of mechanical and electromechanical parts as well as assemblies for the international Original Equipment Manufacturers market.

Starting off with the production of metal and plastic enclosures for electronic applications and the assembly of half-products and elaborate cables, MechaTronix utilised several production processes, amongst which die casting, forging, extrusion and plastic injection.

The application of secondary processes such as CNC grinding and cutting and finishing such as anodising, painting and silk screen printing enable us to offer a very high degree of customisation and personalisation to our customers. It was through the expertise in these processes that MechaTronix found its stride as a serious contender in the market of heat sinks and cooling engines. What started as a one-off venture into the extrusion of aluminium heat sinks resulted in a very comprehensive package of cooling solutions for the booming international LED market.

In 2016 the knowledge made an extra jump with the acquisition of Cooling House, based in Taipei Wugu. This high end design and development center specializes in the deep matters of advanced thermal management, which goes much further than LED cooling – heat exchangers for data centers, renewable energy and high power conversions are their field of play.

With this extension also the LED cooling activities showed new possibilities with technologies introduced like heat pipes and loop thermosyphons.

As a result MechaTronix started in 2017 with their second core mission – the design, development and manufacturing of LED grow lights for use in a wide score of horticulture applications.

Seen the rising demand of PPF values growers want to apply to their crops, similar like what has been seen in the evolution of SON-T HPS grow lamps, the thermal management of LED grow lights is absolutely key for the lifetime of high power LED applications.

From this perspective we started developing complete LED grow light concepts which outstand on lifetime, PPF values out of a single luminaire, light distribution and canopy penetration.

With the first horti LED top lights brought to the market in early 2018, MechaTronix instituted a dedicated team working around LED grow light solutions for the future.

OUR PROCESS STARTS WITH LISTENING



Mastering LED Cooling

With the evolution of LED lighting over the last years, the demand for professional thermal solutions has grown exponentially. And now that we no longer remain in the realm of low power LED's, thermal management becomes a critical factor within LED fixtures. To that end, MechaTronix has developed several series of pin-fin and star heat sinks, manufactured through die casting, forging or extrusion. This has resulted in a comprehensive range of more than 400 off-the-shelf available LED coolers, for passive or active heat dissipation.

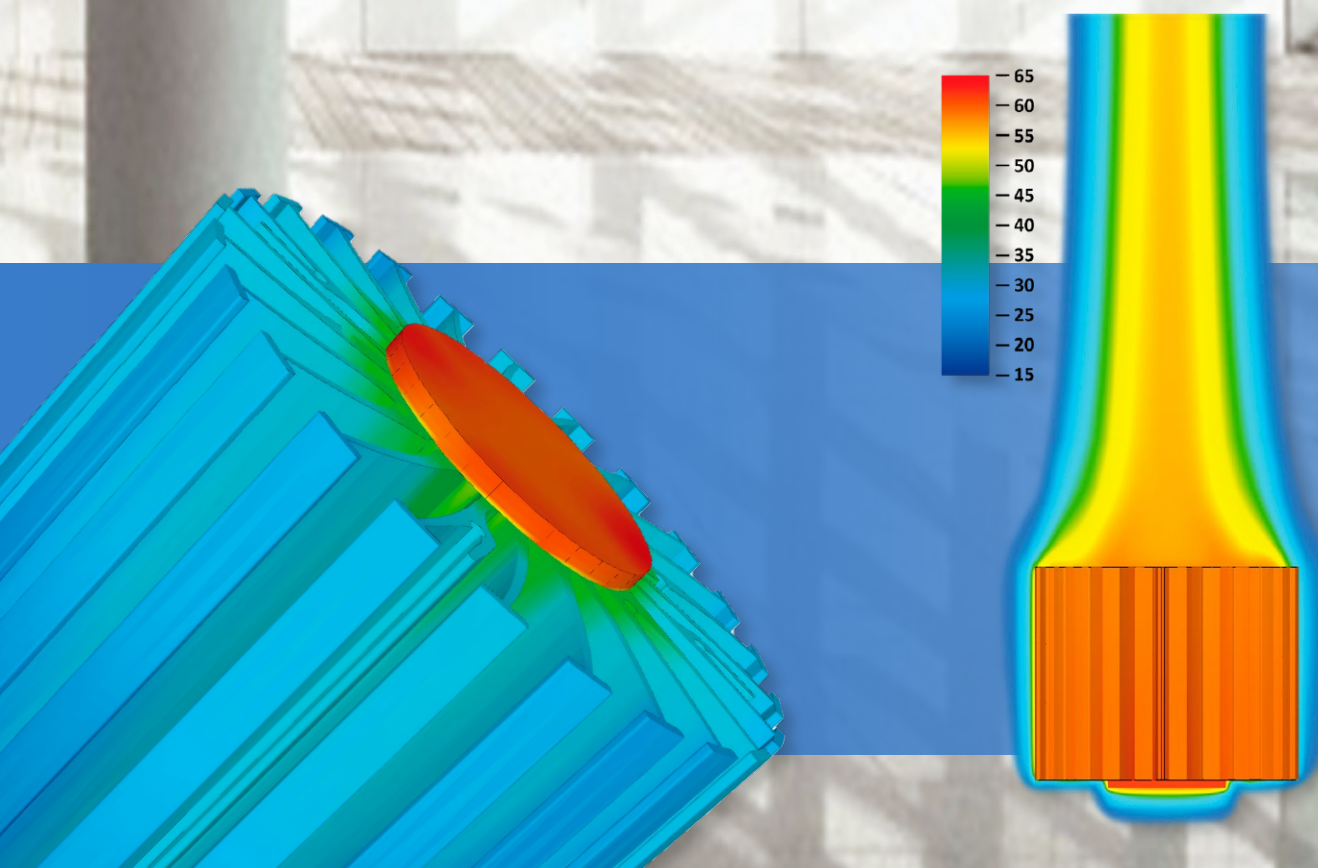
After initial reservations concerning active LED coolers, specialists have found that there really is no better option, when closing in on the 8000 lumen mark. Admittedly, the fan's lifespan becomes somewhat of a focal point in the application of an active LED cooler, but given that the lifespan of the LED engine itself dramatically decreases at high temperatures, the lifespan of the fan looks rather favourable all of a sudden.

MechaTronix' ground breaking ModuLED coolers and its actively cooled sibling IceLED have garnered a lot of attention and positive reviews in the LED market. ModuLED and IceLED are just precursors of a complete range of dedicated and highly effective LED coolers for professional deployment in spotlights, downlights, high bays and a further score of architectural and utility LED applications.

Both ModuLED and IceLED, as well as their upcoming descendants are Zhaga-ready and have a matrix of mounting holes that allows for very easy attachment of a great number of market-leading LED engines. Simply apply a thermal interface of your choice, put the LED engine in place and fasten with self-tapping screws and you are good to go! No drilling, customisation or special mounting brackets are needed.

Thanks to an extremely thorough thermal verification of all heat sink lines, MechaTronix provides total thermal disclosure for each model, coupled with several brands and categories of LED COB's and engines. All thermal data is available in the product specifications, that come with every MechaTronix heat sink. In this way, engineers save time and effort during the design stage of their LED fixture and will significantly shorten their time to market.

OUR PROCESS STARTS WITH LISTENING



Zhaga & ECO Partnerships

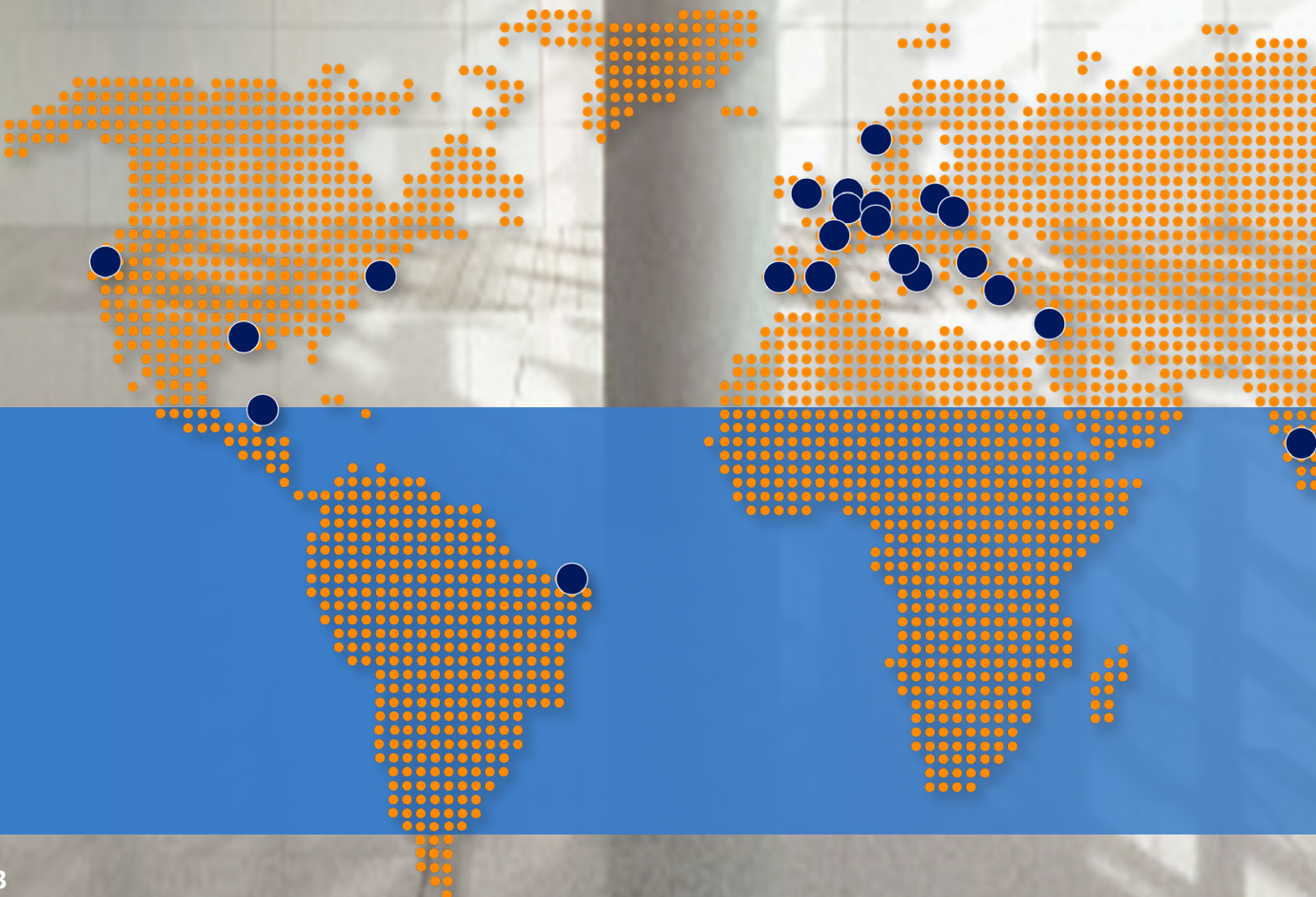
In conjunction with several world leading LED manufacturers and other stakeholders in the field, MechaTronix whole heartedly supports the emerging Zhaga industry standard. To that end, many off-the-shelf MechaTronix heat sinks-passive as well as active- are compatible with these Zhaga specifications, making them instantly ready for assembly with Zhaga designed LED engines or secondary optics, such as lenses or reflectors.

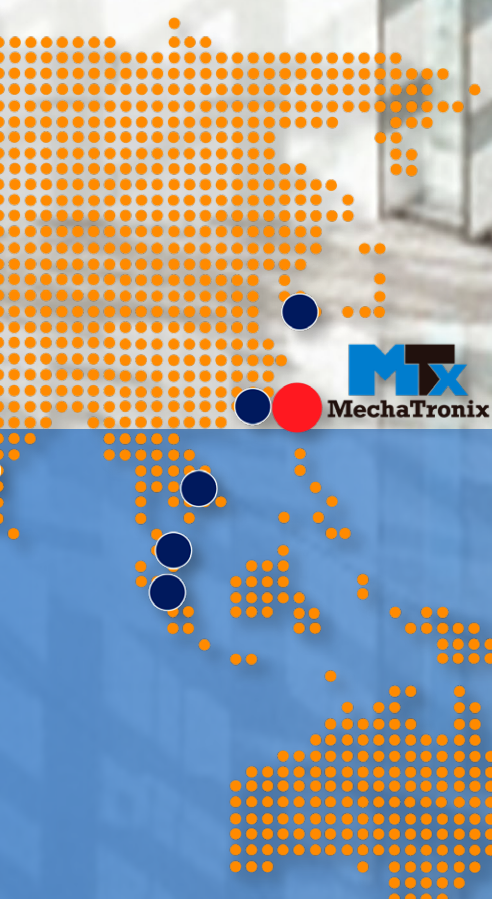
Despite Zhaga's efforts, the international market still offers a great diversity in unique mechanical formats for LED engines. MechaTronix appreciates the need for LED coolers to be modular plug and play components, matching all varieties of LED engines and secondary optics.

Not surprisingly, MechaTronix has been able to forge strong alliances with- and establish specific heat sink ranges for many leading LED manufacturers. Amongst these are the likes of Bridgelux, Citizen, Cree, Edison, GE Lighting, LG Innotek, Lumileds, Luminus, Osram, Osram Opto Semiconductors, Philips Lighting, Prolight Opto, Seoul Semiconductor, Sharp, Tridonic, Vossloh Schwabe and Xicato. Countless hours of compatibly testing enable us to present you with complete and validated thermal data of all feasible combinations of heat sinks and LED engines.

As a result of these efforts, MechaTronix has found a score of LED manufacturers and other specialist parties in the business to form ECO partnerships with. The mutual sharing of data and R&D and the adherence to Zhaga specifications comes with great benefits to all involved, not forgetting the end users. MechaTronix now is being endorsed as the preferred brand of heat sinks within these ECO Partnerships, guaranteeing a perfect mechanical fit, reliable thermal performance and an overall aesthetic design.

OUR PROCESS STARTS WITH LISTENING





Horti LED Grow Lights – The Next Dimension

A new era for MechaTronix started in early 2017, with the design and manufacturing of advanced LED grow light systems.

Our dedicated team of specialists has dived in the science of horticultural lighting and translated this science to new unprecedented technologies which created The Next Dimension in LED grow lights.

High power LED top light systems, ideal for SON-T replacement in greenhouses, where developed based on advanced heat pipe cooling technology.

As a result of all these new technology implementations, the CoolFin[®], CoolPack[®] and CoolStack[®] are now among the most appreciated LED grow lights in the market.

A complete new approach in LED light for vertical farming and propagation has seen the light with the CoolGrow[®] VF and CoolGrow[®] Linear, resulting in absolute market leading PPFd values per watt.

A complete wireless control system nicknamed the CoolControls[®], dedicated for use in horticulture lighting, has found its way to the market.

And that's not where it stops...

MechaTronix will strive over the next years to bring more advanced technologies into the world of horticulture lighting, surpassing the goal of providing the ideal light for plant growth and creating the Next Dimension.



OUR PROCESS STARTS WITH LISTENING



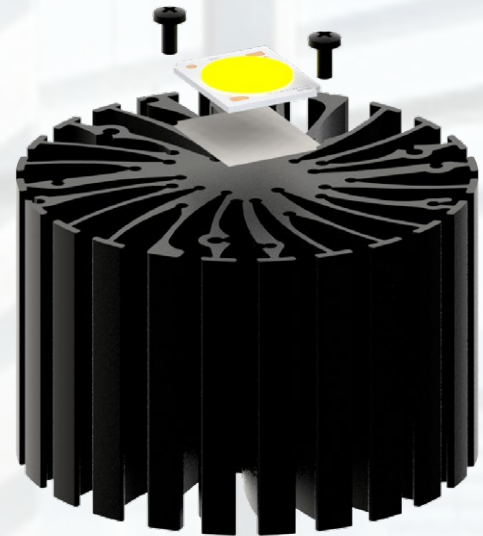
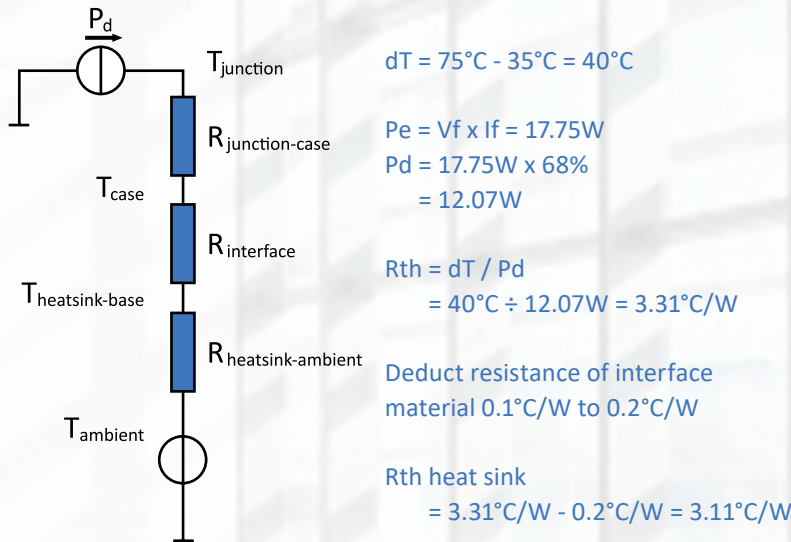
THERMAL CALCULATION

1. Calculation of the required LED Cooler Thermal Resistance Rth

In this document we show how to calculate the required thermal resistance of the LED cooler

As an example we take a LED COB model, which has a nominal forward current I_f of 450mA and a maximal forward current of 900mA
 We will drive the module at a forward current of 500mA with a forward voltage V_f of 35.5V
 The maximal case temperature T_c is 105°C but in our design we aim at a life time case temperature of 75°C
 The ambient temperature for our application is 35°C

A LED luminaire can be seen as an electrical scheme with the thermal resistances of the LED internally, the interface material and the LED cooler in series



The electrical power $P_e = V_f \times I_f$ or $35.5\text{V} \times 0.5\text{A} = 17.75\text{W}$
 The dissipated power $P_d = P_e \times \text{efficiency}$ where the efficiency of the COB is around 32% or $17.75\text{W} \times 0.68 = 12.07\text{W}$
 This is the amount of energy which need to be cooled down

dT is the temperature difference between the case temperature T_c we want to acquire and the ambient temperature T_a
 $dT = T_c - T_a$ or $75^{\circ}\text{C} - 35^{\circ}\text{C} = 40^{\circ}\text{C}$

The required maximal thermal resistance R_{th} of the LED cooler + the thermal interface material $R_{th} = dT / P_d = 40^{\circ}\text{C} / 12.07\text{W} = 3.31^{\circ}\text{C/W}$
 The thermal interface you use has a major impact on the performance
 We recommend to use either arctic silver, a good thermal grease or a thin 0.1 to 0.15mm phase change or graphite thermal pad
 In this case the thermal resistance from the interface material will be between 0.1 and 0.2°C/W
 This interface resistance you subtract from the calculated interface resistance to determine the cooling performance your heat sink needs to be
 So $R_{th} \text{ heatsink} = 3.31^{\circ}\text{C/W} - 0.2^{\circ}\text{C/W} = 3.11^{\circ}\text{C/W}$ maximal

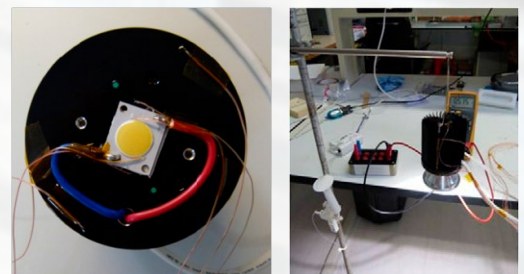
Any led cooler which does better than a thermal resistance (lower value) of 3.11°C/W in free air conditions would make that our LED case temperature T_c will remain below the required 75°C
 Keep in mind that an enclosure around the LED cooler, tilting and other variations will affect the performance of the LED cooler – contact us in case assistance is needed

2. Lab measurement of the required LED cooler

MechaTronix has performed over 1000 hours of lab measurements on the combination of world leading LED manufactures LED COB's and modules, with various LED coolers and alternative driving currents

These lab tests are done under free air convection environment, vertical positioning with the LED on the bottom
 For the tests we use a phase change thermal interface Laird TPCM 585

To conduct thermal measurement we use good digital meter (2 channels or more) and thin wire thermocouples which can easily measure the T_c point under operation
 Besides a thermocouple on the T_c point, also attach a thermocouple on the base of the LED cooler near the LED module
 When we see a temperature difference of more than 5°C between the two points, we will verify if it's caused by interface material or wetting surface (the contact between the LED module and the LED cooler)



MECHATRONIX LED COOLER OVERVIEW

MTX LED cooler model name	Style	Dimension (mm)		Rth* ¹ (°C/W)	Cooling performance (lm)	Electrical Power Pe (w) ^{*2}	Dissipated Power Pd (w) ^{*3}
		∅ Diameter	Height				
LPF3550-ZHC	Forging AL1070	∅35	50	7.41	700 - 1,300	10	6.8
LPF4768-ZHP		∅47	68	3.9	1,300 - 2,500	19	13
LPF6050-ZHC		∅60	50	4.0	1,200 - 2,300	18	12
LPF6768-ZHP		∅67	68	2.1	2,300 - 4,600	35	24
LPF8050-ZHC		∅80	50	2.34	2,000 - 4,000	31	21
LPF8668-ZHC		∅86	68	1.46	3,300 - 6,500	50	34
LPF11180-ZHE		∅111	80	1.07	4,800 - 9,600	74	50
CoolStar® 3445	Extrusion AL6063-T5	∅34.5	45	8.13	600 - 1,200	9	6
CoolStar® 4740		∅47	40	5	1,000 - 2,000	15	10
CoolStar® 4760			60	4.17	1,200 - 2,400	18	12
CoolStar® 6730		∅67	30	3.13	1,600 - 3,100	24	16
CoolStar® 6760			60	2.27	2,100 - 4,200	32	22
CoolStar® 8630		∅86	30	2.08	2,300 - 4,600	35	24
CoolStar® 8660			60	1.56	3,100 - 6,100	47	32
ModuLED Pico 4750	Extrusion AL6063-T5	∅47	50	5.3	900 - 1,800	14	9.6
ModuLED Pico 4780			80	4.2	1,200 - 2,300	18	11.9
ModuLED Nano 7050		∅70	50	2.2	2,200 - 4,300	33	22.7
ModuLED Nano 7080			80	1.8	2,700 - 5,300	41	28
ModuLED Micro 8630		∅86	30	1.8	2,700 - 5,300	41	28
ModuLED Micro 8650			50	1.5	3,200 - 6,400	49	33
ModuLED Micro 8680			80	1.2	4,000 - 8,000	62	42
ModuLED 9950 / Xtra 9950		∅99	50	1.34	3,600 - 7,200	55	37.3
ModuLED 9980 / Xtra 9980			80	1.02	4,700 - 9,400	72	48.9
ModuLED Mega 13420	Extrusion AL6063-T5	∅134	20	1.32	3,700 - 7,300	56	38
ModuLED Mega 13450			50	0.88	5,500 - 11,000	84	57
ModuLED Mega 134100-HBG			100	0.67	7,200 - 14,300	110	75
ModuLED Giga 15220		∅152	20	1.13	4,300 - 8,500	65	44
ModuLED Giga 15250			50	0.7	6,800 - 13,500	104	71
ModuLED Giga 152100-HBG			100	0.52	9,000 - 18,000	140	95
ModuLED Giga 152150-HBG			150	0.46	10,500 - 21,000	162	110

MECHATRONIX LED COOLER OVERVIEW

MTX LED cooler model name	Style	Dimension (mm)		Rth* ¹ (°C/W)	Cooling performance (lm)	Electrical Power Pe (w)* ²	Dissipated Power Pd (w)* ³
		∅ Diameter	Height				
CoolBay® Giga-A / Giga-B	Extrusion AL6063-T5 (Heat sink body) + Closed-loop copper heat pipe (Heat sink core)	∅152	200	0.34	14,500 - 29,000	221	150
CoolBay® Tera-A / Tera-B		∅192	250	0.22	22,000 - 44,000	335	228
CoolBlock® SQ-01 2x2MX	Die-casting ADC12	W96 - L96 - H61.5		1.45	3,300 - 6,500	50	34
CoolBeam® SQ3-01 (3x) CoolBlock® SQ-01 2x2MX	SPCC	W107 - L316 - H150.5		1.45	9,500 - 19,000	144	98
CoolBeam® SQ4-01 (4x) CoolBlock® SQ-01 2x2MX		W107 - L418 - H150.5		1.45	12,500 - 25,000	191	130
CoolBeam® SQ Dual (8x) CoolBlock® SQ-01 2x2MX		W240 - L418 - H125		1.45	25,000 - 50,000	382	260
CoolBeam® SQ Triple (12x) CoolBlock® SQ-01 2x2MX		W370 - L418 - H125		1.45	37,500 - 75,000	574	390
CoolBlock® HB-28	Die-casting ADC12	W106 - L106 - H62		1.16	3,800 - 7,600	63	42.8
CoolBlock® LX-01-2x6 / -02-2x6		W80 - L192 - H45		1.09	4,400 - 8,700	67	45.6
CoolBlock® ARENA-48		W180 - L180 - H80		0.47	10,000 - 20,000	156	106
CoolBlock® HC-01-3x11		W98 - L340 - H61.5		0.47	10,000 - 20,000	156	106
CoolFin® Giga	Stackfin + Heat pipe	W468 - L446 - H226		0.1	50,000 - 100,000	735	500
CoolFin® Giga Tilt		W468 - L446 - H394		0.1	50,000 - 100,000	735	500
CoolCube® Giga	Stackfin + Heat pipe	W200 - L575 - H417		0.1	50,000 - 100,000	735	500
IceLED 450	Extrusion AL6063-T5 (Heat sink body) + Plastic injection (Fan)	∅99	45	0.58	8,200 - 16,400	126	85.5
IceLED 550 / Xtra 550			55	0.46	10,500 - 21,000	160	109
IceLED Ultra / Xtra Ultra			75	0.25	19,000 - 38,000	294	200
IceLED Ultra VS			75	0.26	14,500 - 29,000	221	150

*¹ The thermal resistance Rth is determined with a calibrated heat source of 30mm x 30mm central placed on the heat sink, Tamb 40° and an open environment. Reference data @ heat sink to ambient temperature rise Ths-amb 50°C
The thermal resistance of a LED cooler is not a fix value and will vary with the applied dissipated power Pd

*² ηL, LED Light efficiency is based on 32%

*³ Dissipated power Pd. Reference data @ heat sink to ambient temperature rise Ths-amb 50°C
The maximal dissipated power needs to be verified in function of required case temperature Tc or junction temperature Tj and related to the estimated ambient temperature where the light fixture will be placed
Please be aware the dissipated power Pd is not the same as the electrical power Pe of a LED module

LPF - PIN FIN LED COOLERS

LPF3550-ZHC



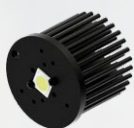
LED Pin Fin cooler
For Zhaga Book 11 LED modules & 13.5x13.5mm LED COB direct mounting holes
ø35mm - H50mm - Rth 7.41°C/W
Cooling performance 700 - 1,300 lm
Black or clear anodised

LPF4768-ZHP



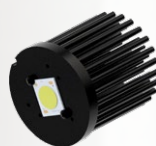
LED Pin Fin cooler
For Zhaga Book 3, Book 11 LED modules & 16x19mm, 20x24mm LED COB direct mounting holes
ø47mm - H68mm - Rth 3.9°C/W
Cooling performance 1,300 - 2,500 lm
Black or clear anodised

LPF6050-ZHC



LED Pin Fin cooler
For Zhaga Book 3, Book 11 LED modules & 13.5x13.5mm LED COB direct mounting holes
ø60mm - H50mm - Rth 4.0°C/W
Cooling performance 1,200 - 2,300 lm
Black anodised

LPF6768-ZHP



LED Pin Fin cooler
For Zhaga Book 3, Book 11 LED modules & 16x19mm, 20x24mm LED COB direct mounting holes
ø67mm - H68mm - Rth 2.1°C/W
Cooling performance 2,300 - 4,600 lm
Black or clear anodised

LPF8050-ZHC



LED Pin Fin cooler
For Zhaga Book 3 LED modules & 19x19mm LED COB direct mounting holes
ø80mm - H50mm - Rth 2.34°C/W
Cooling performance 2,000 - 4,000 lm
Black anodised

LPF8668-ZHC



LED Pin Fin cooler
For Zhaga Book 3 LED modules & 19x19mm LED COB direct mounting holes
ø86mm - H68mm - Rth 1.46°C/W
Cooling performance 3,300 - 6,500 lm
Black or clear anodised

LPF11180-ZHE



LED Pin Fin cooler
For Zhaga Book 3 LED modules mounting holes
ø111mm - H80mm - Rth 1.07°C/W
Cooling performance 4,800 - 9,600 lm
Black or clear anodised

COOLSTAR® - DESIGNER LED STAR COOLERS

CoolStar® Black / White 3445



Designer LED Star cooler
Zhaga Book 11 LED modules & 2 mounting holes for direct assembly of all LED COB brands
ø34.5mm - H45mm - Rth 8.13°C/W
Cooling performance 600 - 1,200 lm
Black anodized or white electro-coating finishing

CoolStar® Black / White 4740



Designer LED Star cooler
Zhaga Book 3, Book 11 LED modules & 5 mounting holes for direct assembly of all LED COB brands
ø47mm - H40mm - Rth 5°C/W
Cooling performance 1,000 - 2,000 lm
Black anodized or white electro-coating finishing

CoolStar® Black / White 4760



Designer LED Star cooler
Zhaga Book 3, Book 11 LED modules & 5 mounting holes for direct assembly of all LED COB brands
ø47mm - H60mm - Rth 4.17°C/W
Cooling performance 1,200 - 2,400 lm
Black anodized or white electro-coating finishing

CoolStar® Black / White 6730



Designer LED Star cooler
Zhaga Book 3 LED modules & 7 mounting holes for direct assembly of all LED COB brands
ø67mm - H30mm - Rth 3.13°C/W
Cooling performance 1,600 - 3,100 lm
Black anodized or white electro-coating finishing

CoolStar® Black / White 6760



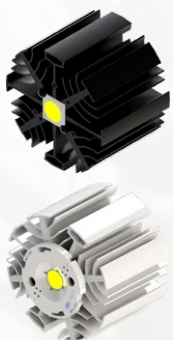
Designer LED Star cooler
Zhaga Book 3 LED modules & 7 mounting holes for direct assembly of all LED COB brands
ø67mm - H60mm - Rth 2.27°C/W
Cooling performance 2,100 - 4,200 lm
Black anodized or white electro-coating finishing

CoolStar® Black / White 8630



Designer LED Star cooler
Zhaga Book 3 LED modules & 7 mounting holes for direct assembly of all LED COB brands
ø86mm - H30mm - Rth 2.08°C/W
Cooling performance 2,300 - 4,600 lm
Black anodized or white electro-coating finishing

CoolStar® Black / White 8660



Designer LED Star cooler
Zhaga Book 3 LED modules & 7 mounting holes for direct assembly of all LED COB brands
ø86mm - H60mm - Rth 1.56°C/W
Cooling performance 3,100 - 6,100 lm
Black anodized or white electro-coating finishing

MODULED - MODULAR LED COOLERS



ModuLED Pico 4750

Modular Passive LED Star cooler
Zhaga Book 3, Book 11 LED modules
& 20 mounting holes for direct
assembly of all LED COB brands
ø47mm - H50mm - Rth 5.3°C/W
Cooling performance 900 - 1,800 lm
Black or clear anodised



ModuLED Pico 4780

Modular Passive LED Star cooler
Zhaga Book 3, Book 11 LED modules
& 20 mounting holes for direct
assembly of all LED COB brands
ø47mm - H80mm - Rth 4.2°C/W
Cooling performance 1,200 - 2,300 lm
Black or clear anodised



ModuLED Nano 7050

Modular Passive LED Star cooler
Zhaga Book 3, Book 11 LED modules
& 20 mounting holes for direct
assembly of all LED COB brands
ø70mm - H50mm - Rth 2.2°C/W
Cooling performance 2,200 - 4,300 lm
Black or clear anodised



ModuLED Nano 7080

Modular Passive LED Star cooler
Zhaga Book 3, Book 11 LED modules
& 20 mounting holes for direct
assembly of all LED COB brands
ø70mm - H80mm - Rth 1.8°C/W
Cooling performance 2,700 - 5,300 lm
Black or clear anodised



ModuLED Micro 8630

Modular Passive LED Star cooler
Zhaga Book 3, Book 11 LED modules
& 30 mounting holes for direct
assembly of all LED COB brands
ø86mm - H30mm - Rth 1.8°C/W
Cooling performance 2,700 - 5,300 lm
Black or clear anodised



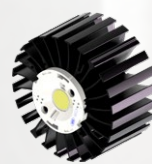
ModuLED Micro 8650

Modular Passive LED Star cooler
Zhaga Book 3, Book 11 LED modules
& 30 mounting holes for direct
assembly of all LED COB brands
ø86mm - H50mm - Rth 1.5°C/W
Cooling performance 3,200 - 6,400 lm
Black or clear anodised



ModuLED Micro 8680

Modular Passive LED Star cooler
Zhaga Book 3, Book 11 LED modules
& 30 mounting holes for direct
assembly of all LED COB brands
ø86mm - H80mm - Rth 1.2°C/W
Cooling performance 4,000 - 8,000 lm
Black or clear anodised



ModuLED 9950

Modular Passive LED Star cooler
Zhaga Book 3 LED modules & 25
mounting holes for direct assembly of
all LED COB brands
ø99mm - H50mm - Rth 1.34°C/W
Cooling performance 3,600 - 7,200 lm
Black or clear anodised

MODULED - MODULAR LED COOLERS



ModuLED 9980

Modular Passive LED Star cooler
Zhaga Book 3 LED modules & 25 mounting holes for direct assembly of all LED COB brands
ø99mm - H80mm - Rth 1.02°C/W
Cooling performance 4,700 - 9,400 lm
Black or clear anodised



ModuLED Xtra 9950

Modular Passive LED Star cooler
Zhaga Book 2, Book 3, Book 5, Book 6, Book 11 LED modules & 22 mounting holes for direct assembly of all LED COB brands
ø99mm - H50mm - Rth 1.34°C/W
Cooling performance 3,600 - 7,200 lm
Black or clear anodised



ModuLED Xtra 9980

Modular Passive LED Star cooler
Zhaga Book 2, Book 3, Book 5, Book 6, Book 11 LED modules & 22 mounting holes for direct assembly of all LED COB brands
ø99mm - H80mm - Rth 1.02°C/W
Cooling performance 4,700 - 9,400 lm
Black or clear anodised



ModuLED Mega 13420

Modular Passive LED Star cooler
Zhaga Book 3 LED modules & 36 mounting holes for direct assembly of all LED COB brands
ø134mm - H20mm - Rth 1.32°C/W
Cooling performance 3,700 - 7,300 lm
Black anodised



ModuLED Mega 13450

Modular Passive LED Star cooler
Zhaga Book 3 LED modules & 36 mounting holes for direct assembly of all LED COB brands
ø134mm - H50mm - Rth 0.88°C/W
Cooling performance 5,500 - 11,000 lm
Black anodised



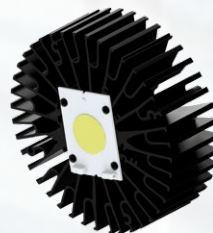
ModuLED Mega 134100

Modular Passive LED Star cooler
Zhaga Book 3 LED modules & 36 mounting holes for direct assembly of all LED COB brands
ø134mm - H100mm - Rth 0.67°C/W
Cooling performance 7,200 - 14,300 lm
Black anodised



ModuLED Giga 15220

Modular Passive LED Star cooler
Zhaga Book 3 LED modules & 27 mounting holes for direct assembly of all LED COB brands
ø152mm - H20mm - Rth 1.13°C/W
Cooling performance 4,300 - 8,500 lm
Black anodised



ModuLED Giga 15250

Modular Passive LED Star cooler
Zhaga Book 3 LED modules & 27 mounting holes for direct assembly of all LED COB brands
ø152mm - H50mm - Rth 0.7°C/W
Cooling performance 6,800 - 13,500 lm
Black anodised

ICELED ACTIVE LED COOLING



IceLED 450

Modular Active LED Star cooler
Zhaga Book 3 LED modules & 25 mounting holes for direct assembly of all LED COB brands
ø99mm - H45mm - Rth 0.58°C/W
Fan Voltage 12Vdc - 50mA
Fan Speed 1500RPM
Cooling performance 8,200 - 16,400 lm



IceLED 550

Modular Active LED Star cooler
Zhaga Book 3 LED modules & 25 mounting holes for direct assembly of all LED COB brands
ø99mm - H55mm - Rth 0.46°C/W
Fan Voltage 12Vdc - 50mA
Fan Speed 1500RPM
Cooling performance 10,500 - 21,000 lm



IceLED Xtra 550

Modular Active LED Star cooler
Zhaga Book 2, Book 3, Book 5, Book 6, Book 11 LED modules & 22 mounting holes for direct assembly of all LED COB brands
ø99mm - H55mm - Rth 0.46°C/W
Fan Voltage 12Vdc - 50mA
Fan Speed 1500RPM
Cooling performance 10,500 - 21,000 lm



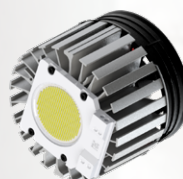
IceLED Ultra

Modular Active LED Star cooler
Zhaga Book 3 LED modules & 25 mounting holes for direct assembly of all LED COB brands
ø99mm - H75mm - Rth 0.25°C/W
Fan Voltage 12Vdc - 230mA
Fan Speed 3000RPM
Cooling performance 19,000 - 38,000 lm



IceLED Xtra Ultra

Modular Active LED Star cooler
Zhaga Book 2, Book 3, Book 5, Book 6, Book 11 LED modules & 22 mounting holes for direct assembly of all LED COB brands
ø99mm - H75mm - Rth 0.25°C/W
Fan Voltage 12Vdc - 230mA
Fan Speed 3000RPM
Cooling performance 19,000 - 38,000 lm



IceLED Ultra VS

Modular Active LED Star cooler
Zhaga Book 2, Book 3, Book 5, Book 6, Book 11 LED modules & 22 mounting holes for direct assembly of all LED COB brands
ø99mm - H75mm - Rth 0.26°C/W
Fan Voltage 12Vdc - 160mA
Fan Speed 2600RPM
Cooling performance 14,500 - 29,000 lm

HBG & COOLBAY® - HIGH BAY LED COOLING

Total assembly example of ModuLED Giga 152100-HBG



Total assembly example of CoolBay® Tera-A



HBG & COOLBAY® - HIGH BAY LED COOLING

ModuLED Mega 13450-HBG



High Bay LED cooler with direct mounting holes for Mean Well HBG series driver
Zhaga Book 3 LED modules & 36 mounting holes for direct assembly of all LED COB brands
ø134mm - H50mm - Rth 0.88°C/W
Cooling performance 5,500 - 11,000 lm
Black anodised

ModuLED Mega 134100-HBG



High Bay LED cooler with direct mounting holes for Mean Well HBG series driver
Zhaga Book 3 LED modules & 36 mounting holes for direct assembly of all LED COB brands
ø134mm - H100mm - Rth 0.67°C/W
Cooling performance 7,200 - 14,300 lm
Black anodised

ModuLED Giga 152100-HBG



High Bay LED cooler with direct mounting holes for Mean Well HBG series driver
Zhaga Book 3 LED modules & 27 mounting holes for direct assembly of all LED COB brands
ø152mm - H100mm - Rth 0.52°C/W
Cooling performance 9,000 - 18,000 lm
Black anodised

ModuLED Giga 152150-HBG



High Bay LED cooler with direct mounting holes for Mean Well HBG series driver
Zhaga Book 3 LED modules & 27 mounting holes for direct assembly of all LED COB brands
ø152mm - H150mm - Rth 0.46°C/W
Cooling performance 10,500 - 21,000 lm
Black anodised

CoolBay® Giga-A



Advanced High Bay LED cooler with CoolTube® quadruple closed-loop heat pipe structure
Direct connection for Citizen CLU056, Edison HM 120W/150W, Seoul ZC100 high power COB LEDs, and for Mean Well HBG-160 LED driver & various accessories
ø152mm - H200mm - Rth 0.34°C/W
Cooling performance 14,500 - 29,000 lm
Black nano coating

CoolBay® Giga-B



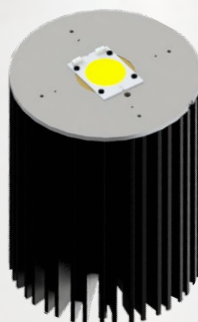
Advanced High Bay LED cooler with CoolTube® quadruple closed-loop heat pipe structure
Direct connection for Bridgelux Vero 29, Cree CXA/CXB35xx, Tridonic FLE high power COB LEDs, and for Mean Well HBG-160 LED driver & various accessories
ø152mm - H200mm - Rth 0.34°C/W
Cooling performance 14,500 - 29,000 lm
Black nano coating

CoolBay® Tera-A



Advanced High Bay LED cooler with CoolTube® quadruple closed-loop heat pipe structure
Direct connection for Citizen CLU056, Edison HM 120W/150W, Seoul ZC100 high power COB LEDs, and for Mean Well HBG-240 LED driver & various accessories
ø192mm - H250mm - Rth 0.22°C/W
Cooling performance 22,000 - 44,000 lm
Black nano coating

CoolBay® Tera-B



Advanced High Bay LED cooler with CoolTube® quadruple closed-loop heat pipe structure
Direct connection for Bridgelux Vero 29, Cree CXA/CXB35xx, Tridonic FLE high power COB LEDs, and for Mean Well HBG-240 LED driver & various accessories
ø192mm - H250mm - Rth 0.22°C/W
Cooling performance 22,000 - 44,000 lm
Black nano coating

HIGH BAY LED ACCESSORIES



ModuLED Optics Adaptor v2 for Reflector & Lens connection

- ModuLED Mega optics adaptor v2
- ModuLED Giga optics adaptor v2

Specific designed adaptor plate for assembly of CoolView® 10 series lenses and CoolBay® Reflectors on ModuLED Mega / Giga series high bay LED Coolers

4 screws M5x10mm included
 ø158mm - Weight 60g - AL1050



CoolView® 10 AG - High End Anti-glare glass lens set

- CoolView® 10-60AG
- CoolView® 10-90AG
- CoolView® 10-120AG

High end patented anti-glare glass lens set with beam angle 60°, 90° or 120°. Compatible with ModuLED Mega / Giga -HBG & CoolBay® series high bay LED Coolers, uniform light dispersion with high transparency 94% efficient.

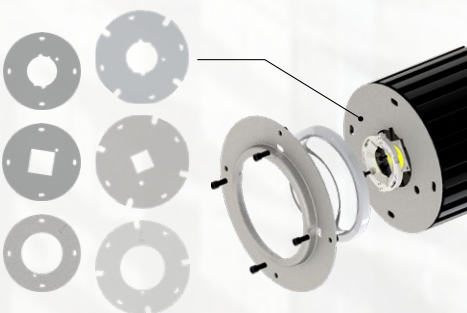
Lens set content : - Borosilicate glass lens
 - Silica sealing ring
 - AL6063 Metal frame lens holder



CoolBay® Reflector - High reflectivity rate reflector set

- CoolBay® Reflector 45 ø420 x H255 - Weight 615g - AL1070
- CoolBay® Reflector 45 PC ø425 x H287.5 - Weight 850g - Polycarbonate
- CoolBay® Reflector 90 ø520 x H185 - Weight 665g - AL1070
- CoolBay® Reflector 120 ø490 x 140 - Weight 585g - AL1070

A limited range of high-end off-the-shelf available high bay reflectors in high transfective coated aluminium or polycarbonate with beam angle 45°, 90° or 120°. Compatible with ModuLED Mega / Giga -HBG & CoolBay® series high bay LED Coolers, uniform light dispersion with high reflectivity rate.



DPP - Dust Protection Plate

- DPP-Mega-2828-01 / -02
- DPP-Mega-3838-01 / -02
- DPP-Mega-ZHAGA3-01 / -02
- DPP-Mega-BW431 / -BW458
- DPP-Giga-2828
- DPP-Giga-3838
- DPP-Giga-ZHAGA3
- DPP-Giga-BW431 / -BW458

Designed for the combination of the MechaTronix ModuLED Mega / Giga series high bay LED Coolers equipped with lens or any reflector with cover to avoid dust accumulation through open structure of the cooling fins.

Compatible with various LED sizes - COB 28x28mm, 38x38mm, Zhaga Book 3 standards LED modules and COBs with Bender+Wirth LED holders.
 Cable hole position foreseen for Mean Well HBG-60, HBG100, HBG-160 LED driver.

HIGH BAY LED ACCESSORIES



CoolBox

Universal high bay LED driver box with direct mounting holes for ModuLED-HBG and CoolBay® series LED Cooler.

Almost all drivers available in the market up to 160 Watt can be mounted inside without the need of drilling or mechanical adaptations.

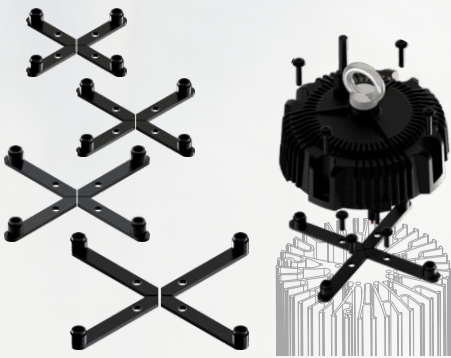
W180mm - L300mm - H130mm
Weight 1076g



Driver Box Connector ring

The connector ring creates an ideal bridge between any driver box in the market and our high bay coolers to allow free air convection

Dedicated mounting holes with MechaTronix ModuLED-HBG and CoolBay® series LED coolers
ø55mm - H20mm - Weight 37g
AL6063

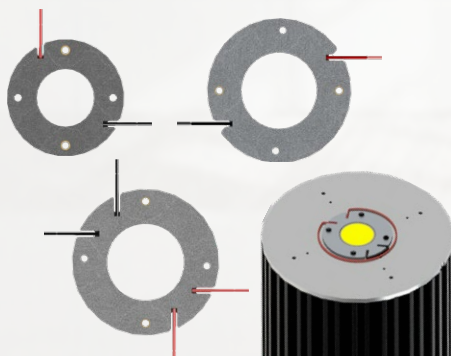


HBG Connector set for MW HBG drivers

- HBG-60 Connector set
- HBG-100 Connector set
- HBG-160 Connector set
- HBG-240 Connector set

Connector set for Mean Well HBG series LED drivers with interchangeability towards all the ModuLED-HBG and CoolBay® series LED coolers. Creates an 11mm gap between the cooler and the driver to allow free air convection.

Screws M5x20mm x 4pcs (Head 8.7mm) and M5x12mm x 4pcs included
AL1060



CoolConnect® COB holder

- CoolConnect® holder COB 28x28
- CoolConnect® holder COB 38x38
- CoolConnect® holder COB 38x38 dual

LED holder constructed out of mica for 28x28mm COB, 38x38mm COB for single or dual-drive. Compatible with ModuLED Mega / Giga and CoolBay® Giga / Tera series high bay LED coolers.

Pre-wired 400mm



HBG driver ring

HBG driver ring for Mean Well HBG series LED driver; Stainless 304.

01 for MW HBG-100, HBG-160:
High quality M10, Max load weight 0.15T (ton)

02 for MW HBG-240:
High quality M12, Max load weight 0.22T (ton)



SUS304 Screws

SUS304 Stainless steel Black Socket Button Head Screw.

Multiple order quantity: 500/box

- M3x4 • M4x10
- M3x6 • M5x6
- M3x8
- M3x16

HIGH BAY LED ACCESSORIES



LCM - Dimming synchronization cable for MW drivers

- LCM-030-SYNC
- LCM-100-SYNC
- LCM-300-SYNC
- LCM-500-SYNC
- LCM-030-SYNC25
- LCM-100-SYNC25
- LCM-300-SYNC25
- LCM-500-SYNC25

Dimming synchronization cable for Mean Well LCM-40, LCM-60 or LCM-25 LED driver. Blue-white twin cable with UL2468 recognition.

Standard length 30cm / 100cm / 300cm / 500cm
Custom made lengths on request



MTX-SR Cable Strain Reliefs for Standard LED Coolers

- MTX-SR-25-05
- MTX-SR-25-15
- MTX-SR-35-05
- MTX-SR-35-15
- MTX-SR-25-CP
- MTX-SR-35-CP

Cable Strain Reliefs in various clamp heights - gap 0.5mm or 1.5mm.

Fits on all Zhaga standard MTX LED Coolers:

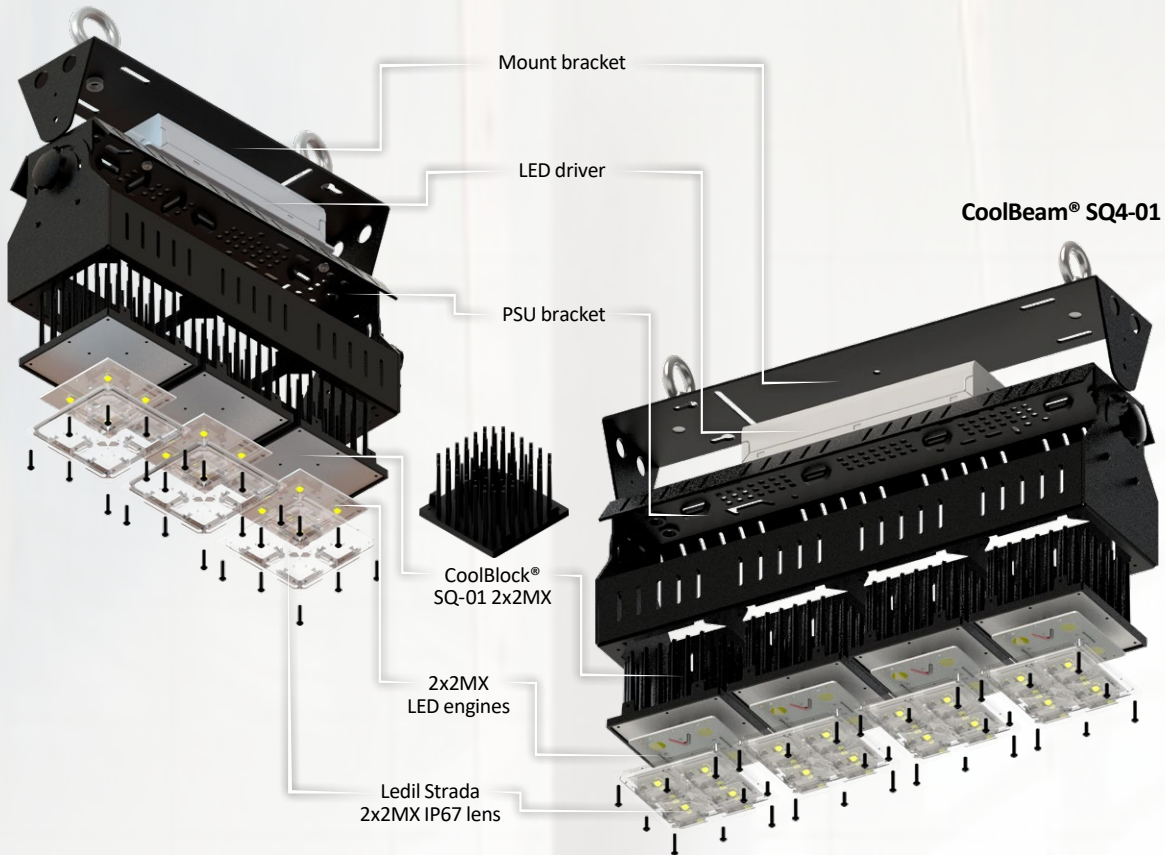
- Mounting pitch 35mm Zhaga Book 3
- Mounting pitch 25mm Zhaga Book 11

Made from PP UL-V0 plastics

COOLBLOCK® & COOLBEAM® 2x2MX FAMILY

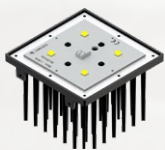
Total assembly example of CoolBeam® & CoolBlock®

CoolBeam® SQ3-01



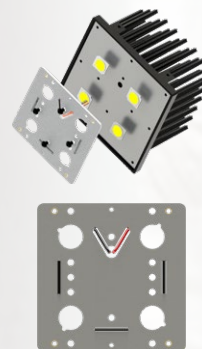
CoolBeam® SQ4-01

CoolBlock® SQ-01 2x2MX



Square Pin Fin LED Cooler for 2x2MX platform. Accommodating LED boards with 4 high power LEDs like the Lumileds XR-M, Cezos 2x2MX (Osram P10), Citizen CLU028, Luminus CHM-9/CXM-9, Cree CXA15 / CXB15, Adura Sinkpad 2x2MX and Ledil Strada 2x2MX lenses for IP67 waterproof with just a few screws
 W96mm - L96mm - H61.5mm
 Thermal resistance R_{th} 1.45°C/W
 Cooling performance 3,300 - 6,500 lm
 Black electro-coating

CoolConnect® holder 2x2MX



LED holder constructed out of mica enabling 4pcs COB LED modules to be placed in the 2x2MX platform.

- **CoolConnect® holder 2x2MX-01**
Fits with (4x) LED COB 15.85x15.85mm
- **CoolConnect® holder 2x2MX-02**
Fits with (4x) LED COB 13.5x13.5mm
Pre-wired 200mm

CoolBeam® SQ3 / SQ4



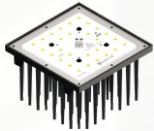
Patented fixture kit accommodating 3 or 4 CoolBlock® 2x2MX LED engines. For industrial flood lights or high bay designs up to 16,000 lumen. Various wall mount and suspended mounting options
 Smart PSU bracket for drivers of Mean Well, Inventronics, Osram,...
 SQ3: W107mm - L316mm - H150.5mm
 SQ4: W107mm - L418mm - H150.5mm
 Black electro-coating

CoolBeam® SQ Dual / Triple



Mounting bracket for 2 or 3 CoolBeam® SQ4-01 luminaires. Creates an industrial flood light, high mast or high bay luminaire up to 60,000 lumen. Free tilting of the individual CoolBeam® arrays for flexible beam patterns
 Dual: W240mm - L418mm - H125mm
 Triple: W370mm - L418mm - H125mm
 Weight 1387g - Black electro-coating

COOLBLOCK® 28 / 2X6 / 48 / 3X11 PCB COOLING



CoolBlock® HB-28

Square Pin Fin LED Cooler accommodating LED boards with 28 high power LEDs like the Acura Stradella SinkPAD PCB 2019-A, 2020-A, 2021-A, 12176-A and Cezos Osram K219; Direct fit with Ledil Stradella IP-28 family lenses for IP67 waterproof designs in various beam patterns.
W106mm - L106mm - H62mm
Thermal resistance R_{th} 1.16°C/W
Cooling performance 3,800 - 7,600 lm
Black electro-coating



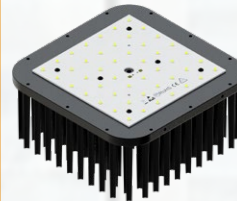
CoolBlock® LX-01 2x6

Rectangle Pin Fin LED Cooler for 2x6 platform. Accommodating LED boards with 12 high power LEDs like the Lumileds Luxeon XR-TX, Cezos Osram 2x6 LED PCB's and Ledil Strada / HB 2x6 lenses for IP67 waterproof with just a few screws
W80mm - L192mm - H45mm
Thermal resistance R_{th} 1.09°C/W
Cooling performance 4,400 - 8,700 lm
Black electro-coating



CoolBlock® LX-02 2x6

Rectangle Pin Fin LED Cooler for 2x6 platform. Accommodating LED boards with 12 high power LEDs like the Acura Sinkpad, Cezos Osram 2x6 LED PCB's and Ledil Strada / HB 2x6 lenses for IP67 waterproof with just a few screws
W80mm - L192mm - H45mm
Thermal resistance R_{th} 1.09°C/W
Cooling performance 4,400 - 8,700 lm
Black electro-coating



CoolBlock® ARENA-48

Square Pin Fin LED Cooler accommodating LED boards with 48 high power LEDs like the Cezos Osram K319, K321, K322, K323, K324; Direct fit with Khatod Arena family reflectors for IP65 waterproof designs in various beam patterns.
W180mm - L180mm - H80mm
Thermal resistance R_{th} 0.47°C/W
Cooling performance 10,000 - 20,000 lm
Black electro-coating



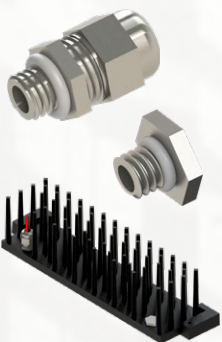
CoolBlock® HC-01 3x11

High Power rectangle pin fin cooler for industrial or horticultural lighting projects. Designed for Ledil Florence with 3x11 lens pockets and Ledil Dahlia with 120 individual lens pockets up to led size 3535; Standard Led boards available from Cezos and Acura for both platforms.
W98mm - L340mm - H61.5mm
Thermal resistance R_{th} 0.47°C/W
Cooling performance 10,000 - 20,000 lm
Black electro-coating



CoolConnect® Inter-01

M4 double head threaded screw as connection bridge for multiple CoolBlock® LED coolers combination.
Compatible with CoolBlock® LX-01-2x6, CoolBlock® LX-02-2x6 and CoolBlock® HC-01-3x11.
Black electro plate steel

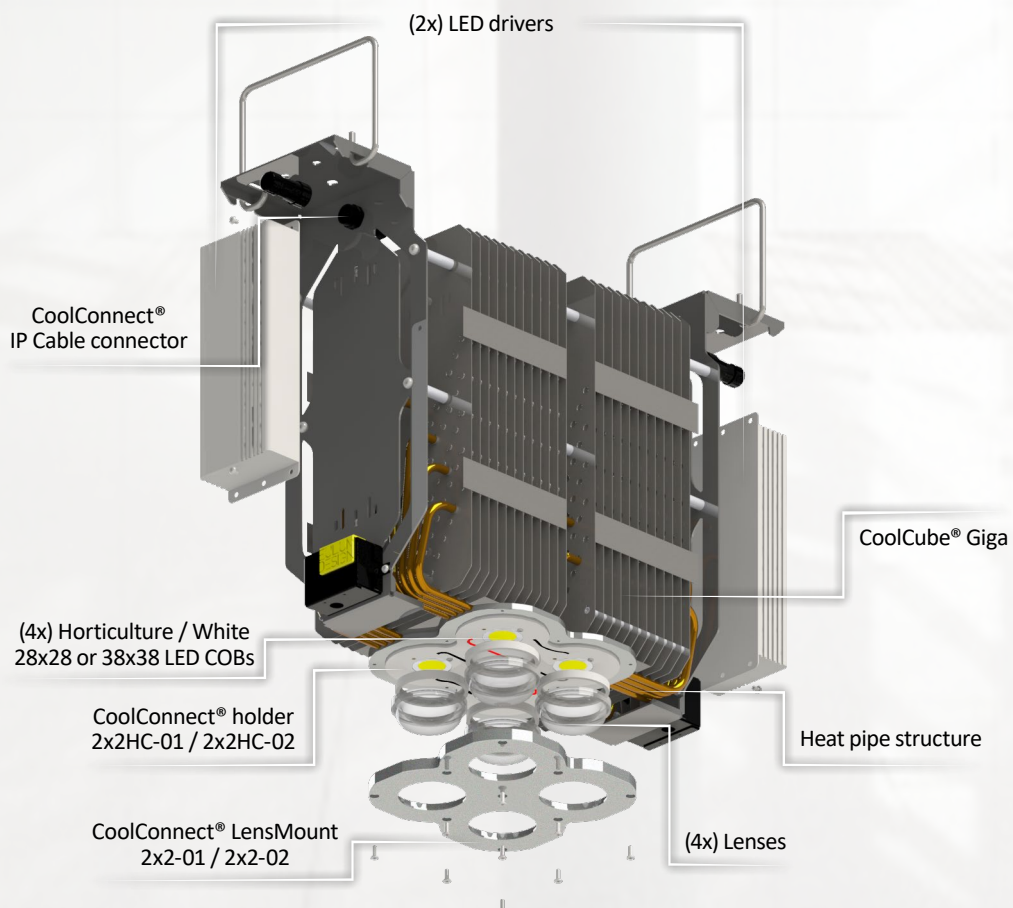
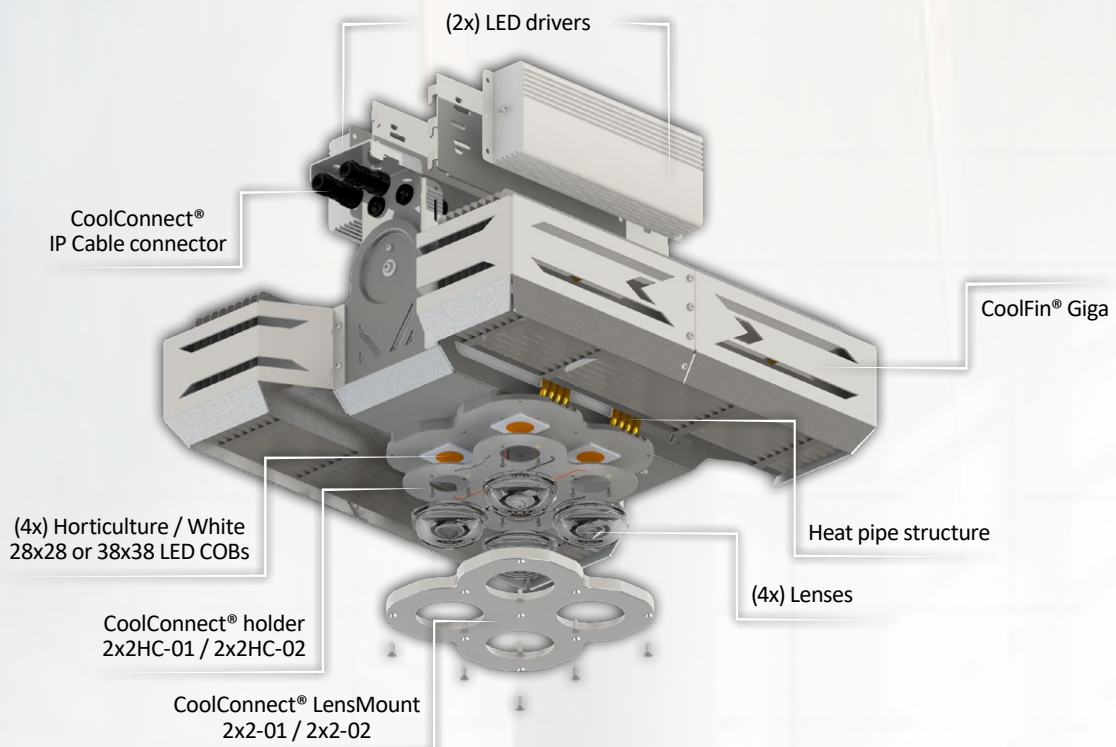


IP Cable gland & Stopper

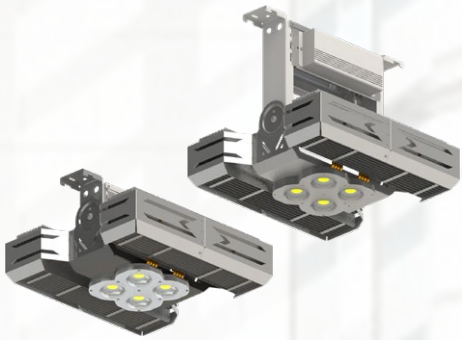
- **CoolConnect® Gland 2-Pole 01**
M6 Waterproof cable gland for 2 wires cable; Nickel plated brass With a 2 pole insert for 1.8mm wire.
- **CoolConnect® Stopper Gland**
M6 stopper for unused entries, Nickel plated brass.

COOLFIN® & COOLCUBE® ADVANCED LED COOLING

Total assembly example of CoolFin® & CoolCube®



COOLFIN® & COOLCUBE® ADVANCED LED COOLING



CoolFin® Giga / CoolFin® Giga Tilt

Advanced Ultra High power LED cooler with stackfin and heat pipe structure
Accommodating 28x28 LED COB like Citizen CLU04H, Lumileds Sunplus 1211 with CoolConnect® holder 2x2HC-01, and 38x38 LED COB like Citizen CLU05H, Lumileds Sunplus 1825 with CoolConnect® holder 2x2HC-02 and for multiple brands LED driver & accessories.

W468mm - L446mm - H226mm - (Tilt) H394mm
Thermal resistance Rth 0.1°C/W

Cooling performance for high bay or high mast application up to 100,000lm, for horticulture top lighting up to 1,500 µmol/s



CoolCube® Giga

Advanced Ultra High power LED cooler with stackfin and heat pipe structure; Ultra compact size with minimal shading surface

Accommodating 28x28 LED COB like Citizen CLU04H, Lumileds Sunplus 1211 with CoolConnect® holder 2x2HC-01 and 38x38 LED COB like Citizen CLU05H, Lumileds Sunplus 1825 with CoolConnect® holder 2x2HC-02 and for multiple brands LED driver & accessories

W200mm - L575mm - H417mm
Thermal resistance Rth 0.1°C/W

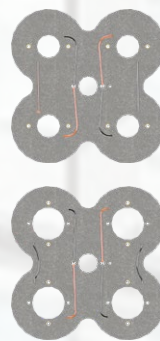
Cooling performance for high bay or high mast application up to 100,000lm, for horticulture top lighting up to 1,500 µmol/s



CoolConnect® LensMount

Lens holder plate with double internal gasket for a perfect IP67 design for CoolFin® and CoolCube® series LED cooler.

- **CoolConnect® LensMount 2x2-01**
Fits with (4x) Ledil Stella series lenses
W259mm - L239mm - Weight 767g
- **CoolConnect® LensMount 2x2-02**
Fits with (4x) CoolView® 7 series lenses
W200mm - L200mm - Weight 567g



CoolConnect® holder 2x2HC

LED holder constructed out of mica enabling 4pcs COB or LOB to be placed in the CoolFin® / CoolCube®; 2 LED engines placed in series with in 4 wires to control 2 individual strings.

- **CoolConnect® holder 2x2HC-01**
Fits with (4x) LED COB/LOB 28x28mm
- **CoolConnect® holder 2x2HC-02**
Fits with (4x) LED COB/LOB 38x38mm



CoolView® 7 AG (Anti-glare) / BW (Batwing) - High End glass lens set

- **CoolView® 7-60AG**
- **CoolView® 7-90AG**
- **CoolView® 7-90BW**
- **CoolView® 7-120BW**

High end patented glass lens set


AG - Anti-glare with beam angle 60°, 90°

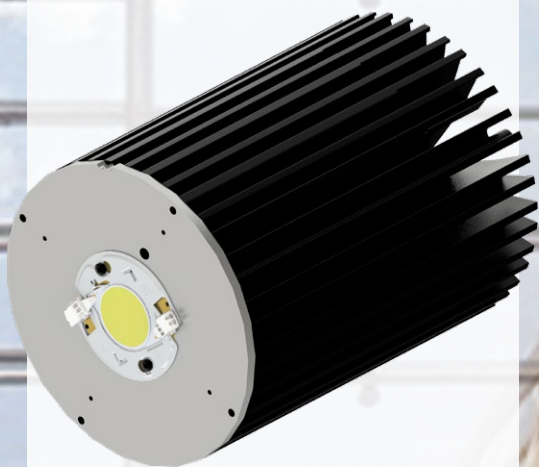
BW - Batwing lighting curve with beam angle 90°, 120°

Compatible with ModuLED CoolFin® & CoolCube® series advanced LED Coolers, uniform light dispersion with high transparency 94% efficient.

Lens set content : - Borosilicate glass lens
- Silica sealing ring

Your local distributor:

OUR PROCESS STARTS WITH LISTENING 



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