

Cooling Solutions

for the lighting industry

ebmpapst

The engineer's choice



About ebm-papst North America



Headquarters - Farmington, CT

- 250,000 square feet
- 275 employees
- Contract manufacturing
- Acoustic testing chamber
- Complete air testing lab on site
- ISO 9001 and ISO 14001 certifications
- Distribution centers in Farmington, CT and Toronto, Canada

ebm-papst is an innovator and market leader in fans, blowers, and motors with core competencies in motor technology, aerodynamics, and electronics. With over 15,000 products, we provide solutions to a wide range of markets including Air-conditioning and Ventilation, Appliance, Commercial Refrigeration, Heating, Industrial, Lighting, IT / Telecom , Medical, Transportation and more.



Support when and where you need it

Knowledgeable field sales professionals are close by for face-to-face meetings. Dedicated inside sales associates fulfill all of your ordering needs. To assist you with order management, our customer service department provides automated services such as shipment notifications, reorder notifications, and invoicing.

Design and manufacturing

Beginning with the initial product concept, our application engineers work in tandem with customers to select the best air moving solution to suit specific goals and requirements. Once the prototype has been established, it can then be tested in our state-of-the-art airflow testing chambers to optimize performance. Each chamber has been designed to meet AMCA 210 and ISO 5801 requirements. In addition to our airflow testing capabilities, ebm-papst can conduct comparative sound, temperature, and velocity tests. The electrical engineering team can design everything from simple fan controllers for monitoring fan speed to complex controllers and power supplies, filtering, and specific communication protocols.



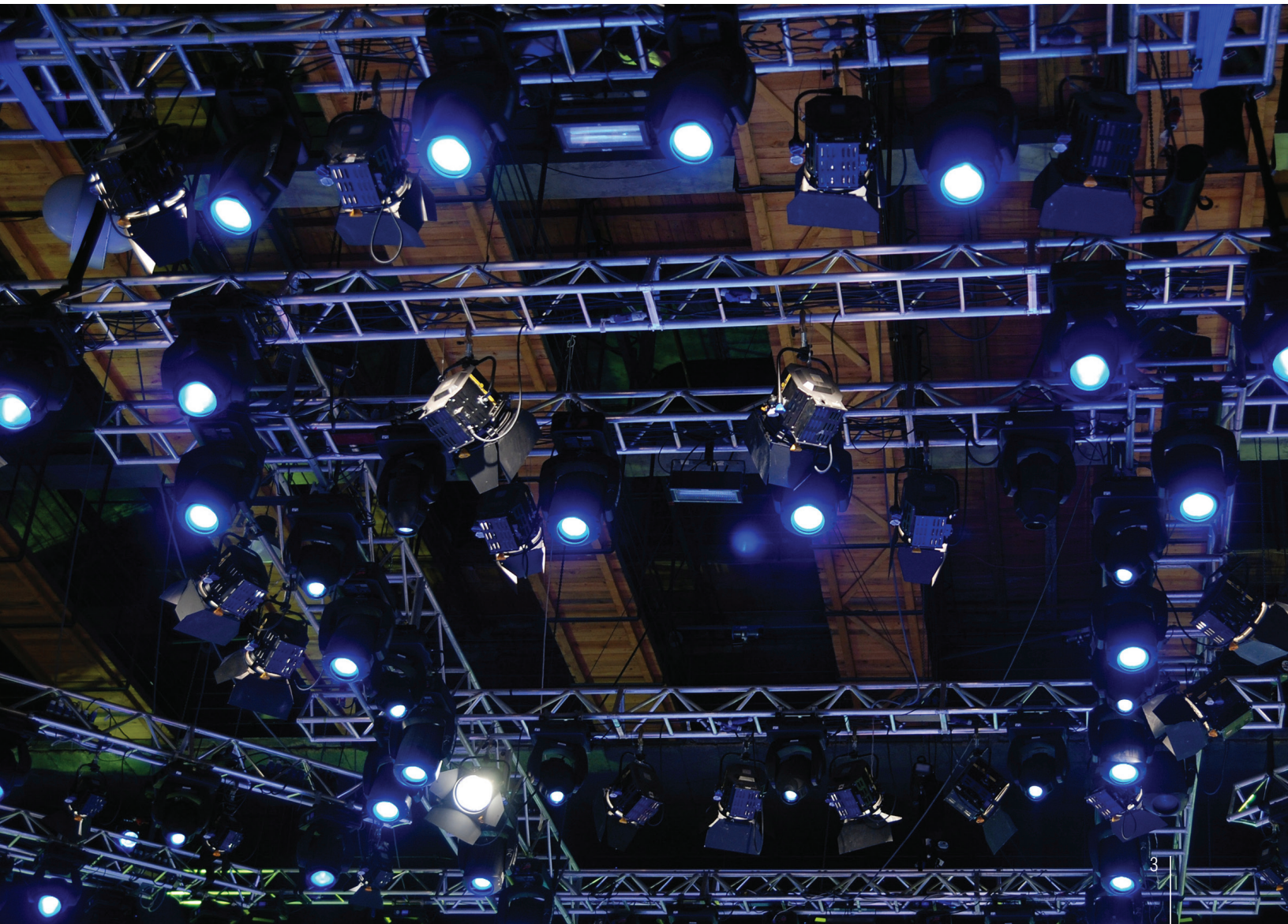
Logistics and inventory management programs

Our facilities feature over 90,000 square feet of climate-controlled warehousing, and utilize bar coding for real-time inventory management. Supply chain management programs such as Kanban demand/pull, safety stock, consignment, and local warehousing can be customized to your needs.

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Sustainability is the center of our GreenTech philosophy

Eco-friendliness and sustainability have always been at the core of our thoughts and actions. For decades, we have worked according to the simple but strict creed of our co-founder Gerhard Sturm: "Each new product we develop has to be better than the last one in terms of economy and ecology." GreenTech is the ultimate expression of our corporate philosophy.

The symbol of our commitment

Our company philosophy encompasses much more than designing new and more efficient fans and blowers; we put it into practice daily - in our offices and factories around the world! GreenTech symbolizes our continuous commitment, achievements, and passion to provide customers with the highest quality products using modern development and production methods, responsible business practices and initiatives that benefit the user as well as the environment.

GreenTech is eco-friendly production

Our GreenTech philosophy drives our product development, upholding the most stringent energy efficiency and environmental standards. Our production processes incorporate GreenTech practices including intelligent use of industrial waste heat and groundwater cooling, photovoltaics and our own cooling and ventilation technology. Our most modern plant consumes 91% less energy than required. From their origin to their recyclable packaging, our products contribute to the protection of the environment.

GreenTech is pro-active development

Even in the design phase, the materials and processes we use maximize the greatest possible eco-friendliness, energy balance and – wherever possible – recyclability. We work to continually improve the material components and performance of our products, as well as enhancing the air flow, decreasing noise characteristics and significantly reducing energy consumption.

Our customers profit from this every day

The heart of GreenTech is our EC technology. At the core of our energy-saving motors and fans, EC technology provides up to 90% efficiency, significantly extends service life and makes our products maintenance-free. These values pay off for the environment as well as offer cost-savings for the user! All ebm-papst products feature the greatest possible connection of economy and ecology.



Market overview




The LED market

With high visible light, low radiant energy, and no infrared or ultraviolet light, LEDs are the most efficient light source in the lighting market today. While as much as 80% more energy efficient than traditional incandescent lighting, LED components still create a considerable amount of heat. High temperatures can cut the lifespan of an LED light in half. Temperatures over the maximum rated junction can quickly weaken the lumen output and the color rendering index of LEDs.

By dissipating the heat emitted by the LED light source, the efficiency and length of life of the light source can increase exponentially. Thermal management is a key factor in lumen output. For high-lumen output applications, passive cooling is not enough. In order to reach the desired lumen values in a small form factor, active cooling is the perfect solution to

effectively disperse the heat produced by LED components. Active cooling solutions are a new contender in LED thermal management systems. Dissipating heat directly from the core of the modules allows for less thermal resistance, making the entire assembly more efficient. Active cooling technology offers thermal capabilities that are superior to passive heat sinks and can raise performance while significantly reducing the size of the lighting fixture. With industry-leading German-engineered compact fans and American-designed assemblies, ebm-papst can provide the perfect cooling solution for your LED application. One of the most significant advantages that ebm-papst fans have on the life of the LED light is the reliability of our products. With active cooling solutions far surpassing the 50,000+ hour promise the industry is accustomed to, an ebm-papst fan is now the LED light's most efficient cooling source.

Lifetime

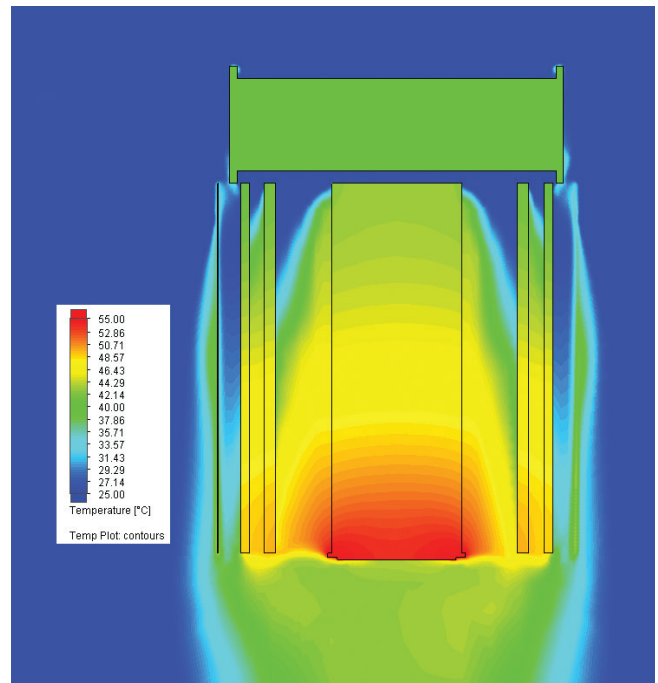
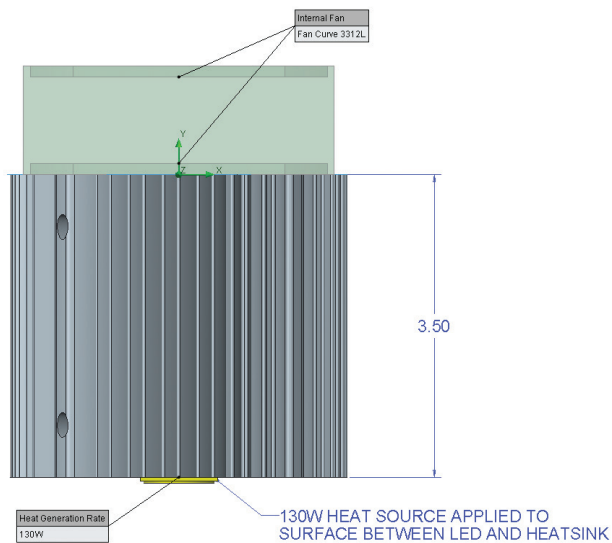
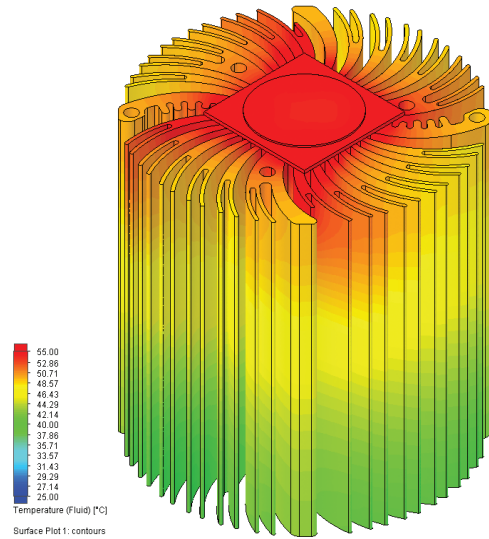
Type	Series	Dimensions mm	Temperature range °C	Lifetime hours	Lifetime years	
Axials		400, 400F, 412F	40 x 10 / 20	-20...+85°C ¹	120,000 / 90,000 / 115,000	13.7 / 10.3 / 13.1
		500F	50 x 15	-20...+85°C ¹	120,000	13.7
		600F, 620	60 x 15 / 25	-20...+85°C ¹	120,000 / 305,000	13.7 / 34.8
		8200J, 8400N, 8450	80 x 38 / 25	-20...+70°C ²	237,500 / 305,000 / 305,000	27.1 / 34.8 / 34.8
		3200J, 3400N	92 x 38 / 25	-20...+70°C ²	265,000 / 305,000	30.3 / 34.8
		4100N, 4300, 4400F, 4400FGLLA	119 x 38 / 32 / 25	-20...+75°C ³	305,000 / 322,500 / 285,000	34.8 / 36.8 / 32.5
Radials		RLF35	51 x 15	-20...+70°C ³	227,500	26
		RL48	76 x 27	-20...+70°C ²	265,000	30.3
		RL65	97 x 93.5 x 33	-20...+70°C ²	227,500	26

Note: ¹-4 to 185°F; ²-4 to 158°F; ³-4°F to 167°F. Lifetime L10 per IPC 9591 at 20°C ambient. Values are dependent on speed and application.

Computational fluid dynamics (CFD)

Computational Fluid Dynamics (CFD)

- Flow simulations using Mentor Graphics FloEFD software
- Design service offered to customers
- Ability to optimize active cooling solutions in conjunction with lamp design
- Predictive analysis of thermal performance and LED junction temperature
- Validation of results using ebm-papst thermal resources
- Accelerates design process for custom applications



Active cooling for LED modules & CoBs

Enabling technology for the LED Market

“Today’s high-performance LEDs, particularly the type known as “Chip-on-Board” (CoB), are the fastest-growing package style for lighting. CoBs are arrays of small die placed together under a single phosphor pour. There are many LED cooling technologies; yet, few have truly addressed the unique requirements of LED systems. ebm-papst, one of the most innovative manufacturers of precision fans and blowers, has introduced their Active Cooling solutions - small, specialized fan/heat sinks engineered expressly for high-power LED applications.

ebm-papst’s fan mechanism offers a particularly reliable service life in the hundreds of thousands of hours (> 300K with certain models). Designed to be nearly silent, each fan is enclosed in an acoustic isolation ring, bringing the net acoustic noise to less than 7 dB. A very impressive noise reduction when compared to background noise in a quiet office usually about 40 dB. When used with a CoB device, the cooling fan effectively lowers the heat temperature to 90°F/36°C. Typically, CoB devices should be kept at less than 120°C. Using the ebm-papst cooling devices provides far lower temperatures than required parameters. In addition to significant noise and heat reduction, ebm-papst offers an impressive 5 year warranty on fans - far exceeding the life-span of most CoBs. Regardless of manufacturer, we think the ebm-papst active cooling solution is an excellent approach – almost a “platform” - for all CoB lighting systems.”

- Cary Eskow

Global Director of the Solid State Lighting & Advanced LED Business Unit
Avnet Electronics Marketing

Benefits of using ebm-papst cooling solutions

- German-engineered compact fans and motors, USA-designed assembly
- Reference designs include Bridgelux, Cree, Philips, CoBs and Xicato Light Engines
- Lifetime: in excess of 87,500 hours at ambient temperatures up to 40°C
- Industry leading reliability: 5 year warranty available (application dependent)
- 100% end of line testing
- Low noise: Custom acoustic isolation ring
 - Solutions operate as low as 7 dB(A)
 - A quiet office has a background noise of about 40 dB(A)
- High efficiency motor design
- Thermal protection: thermal isolation ring



Nominal Data		Nominal voltage	Acoustic noise	Thermal power dissipation capability*	Fan speed	Total mass	Power input	Lifetime (at 20°C)	Lifetime (at 20°C)	Lifetime (at 40°C)	Lifetime (at 40°C)
CoB / LED OEM	Type	VDC	dB(A)	W	rpm	g	W	hours	years	hours	years
High Powered CoBs	PG1W-012-119-XX	12	16	150	1200	582	1.1	176,000	20.0	97,500	11
Bridgelux Vero 10/13/18	PG1W-012-060-13	12	7	60	1800	197	0.18	197,500	22.5	87,500	10
Bridgelux Fortimo SLM	PG1W-012-060-09	12	19	130	3000	672	0.42	137,500	15.7	80,000	9
Cree CXA 20/25	PG1W-012-060-07	12	7	50	1800	227	0.18	197,500	22.5	87,500	10
Cree CXA	PG1W-012-060-08	12	7	50	1800	627	0.18	197,500	22.5	87,500	10
Cree LMH2	PG1W-012-060-11	12	7	73	1800	191	0.18	197,500	22.5	87,500	10
Philips SLM	PG1W-012-060-06	12	7	50	1800	217	0.18	197,500	22.5	87,500	10
Xicato XSM	PG1W-12-60-M3BN**	12	7	38	1800	147	0.18	197,500	22.5	87,500	10
Xicato XLM	PG1W-12-60-L3BN**	12	7	53	1800	277	0.18	197,500	22.5	87,500	10

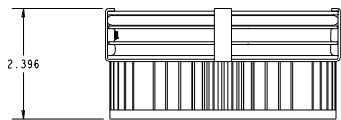
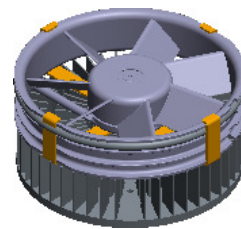
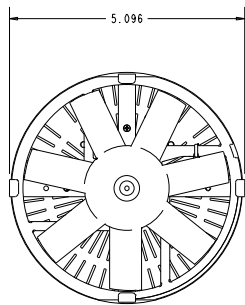
Note: Voltages are based on base fan models. Other voltages available upon request. Lifetime L₅₀ per IPC 9591.
**Various mounting options available. Refer to data on pages 17-18 of this brochure. *Application dependent.

High powered CoBs technical data

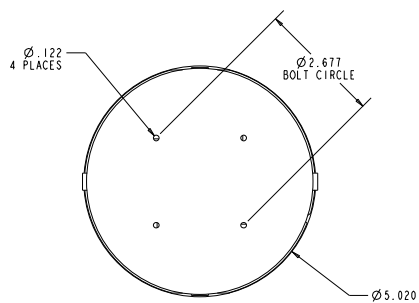
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CREE LMH2

Dimensions shown in inches



AIRFLOW

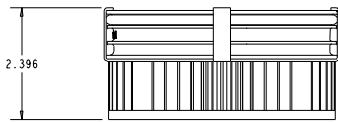
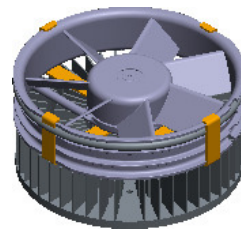
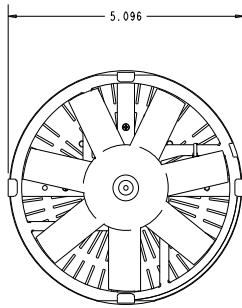


High powered CoBs technical data

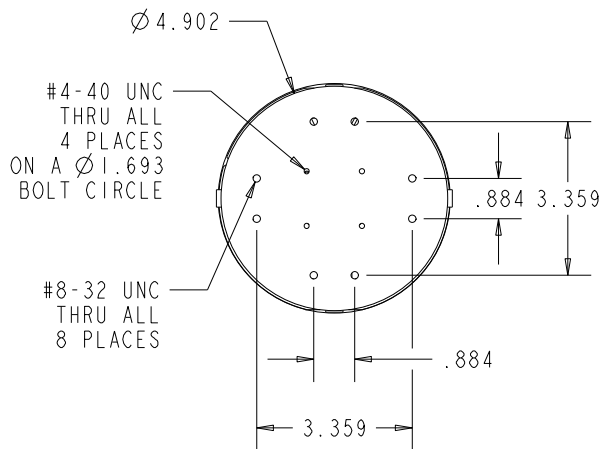
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Bridgelux Vero 29

Dimensions shown in inches



AIRFLOW

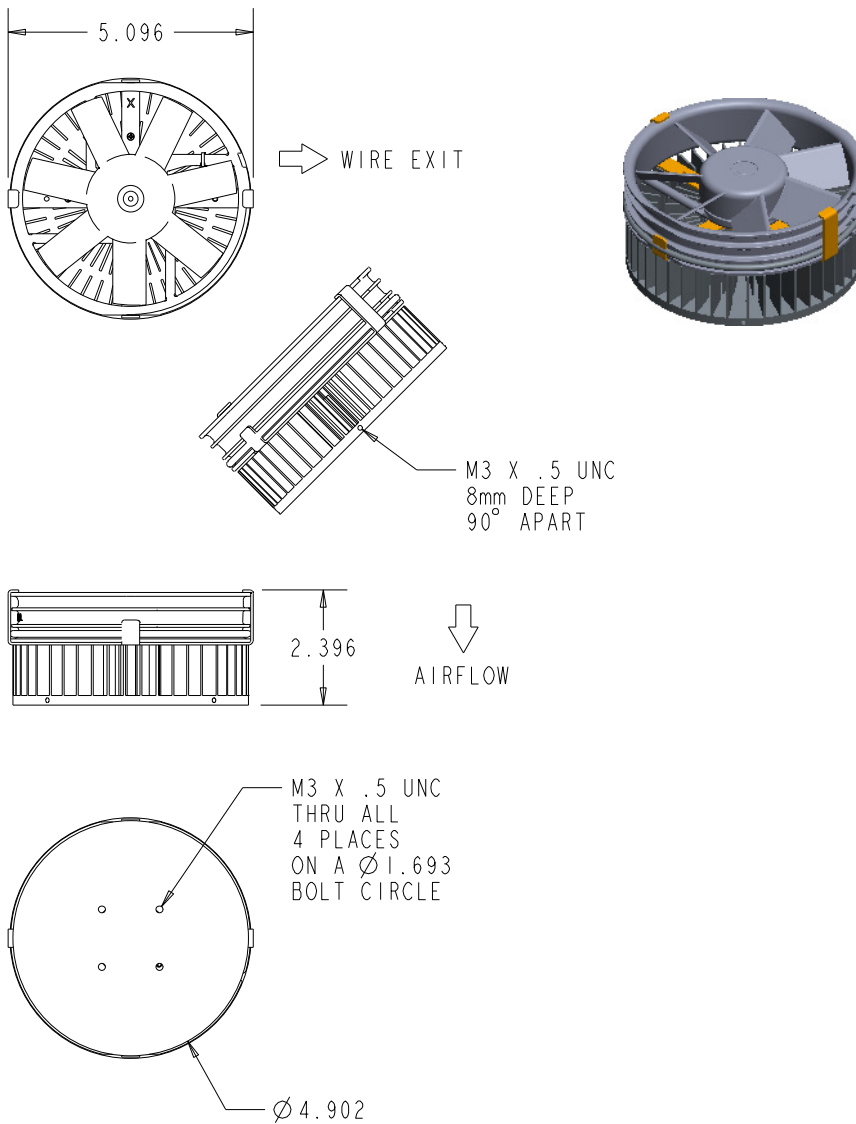


High powered CoBs technical data

PG1W-012-119-12

Bridgelux Vero 29

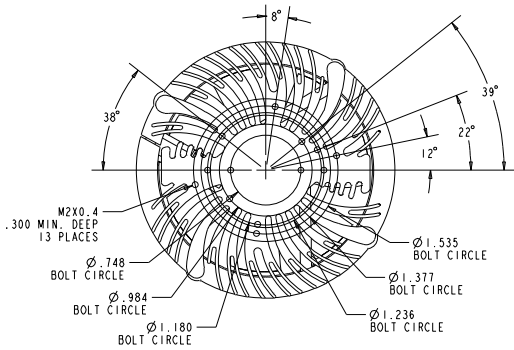
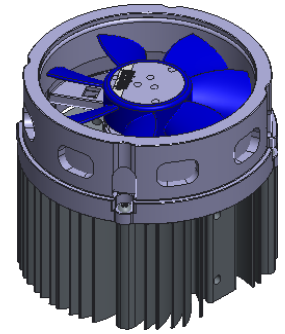
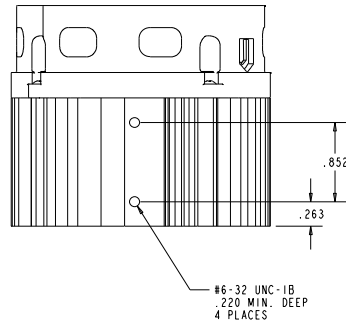
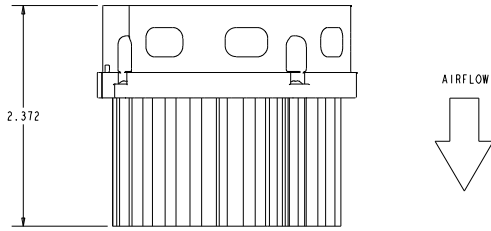
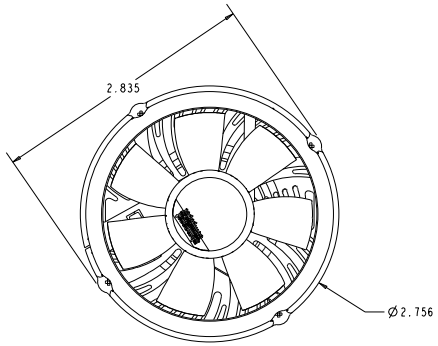
Dimensions shown in inches



Bridgelux Vero 10/13/18 technical data

PG1W-012-060-13

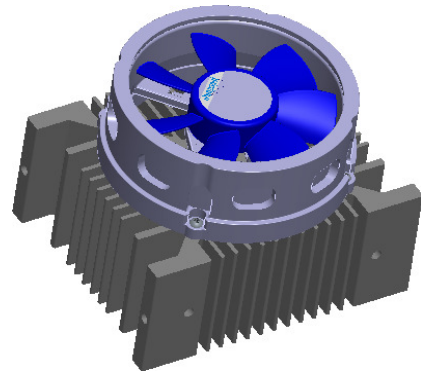
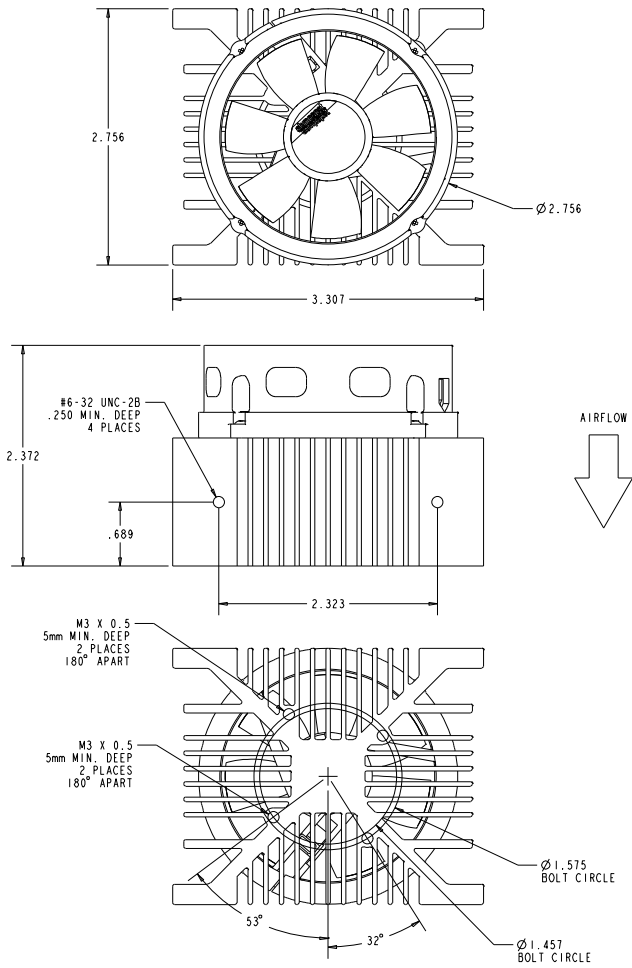
Dimensions shown in inches



Cree CXA technical data

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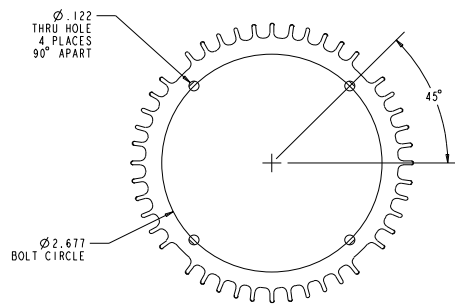
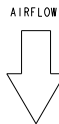
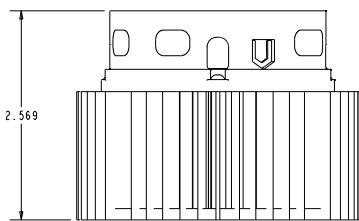
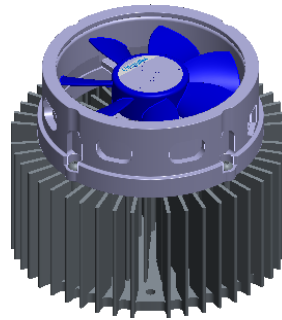
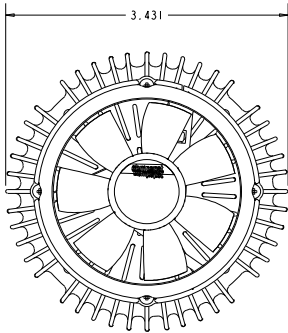
Dimensions shown in inches



Cree LMH2 technical data

PG1W-012-060-11

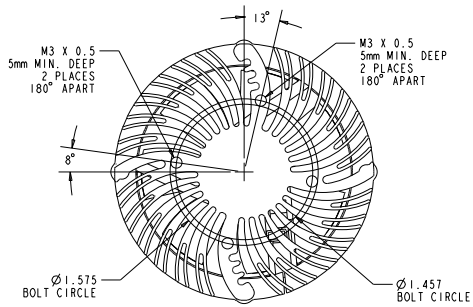
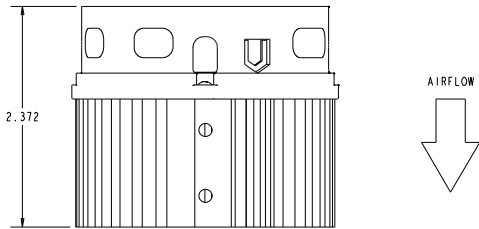
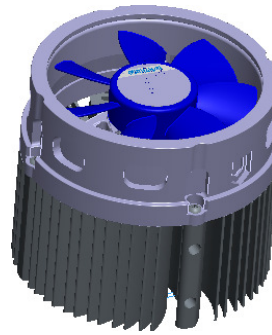
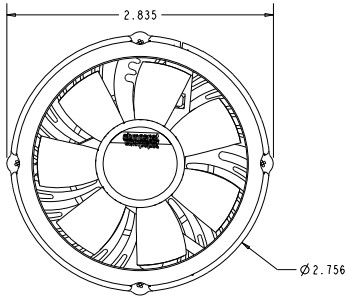
Dimensions shown in inches



Cree 20/25 CXA technical data

PG1W-012-060-07

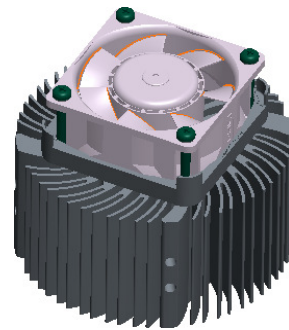
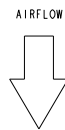
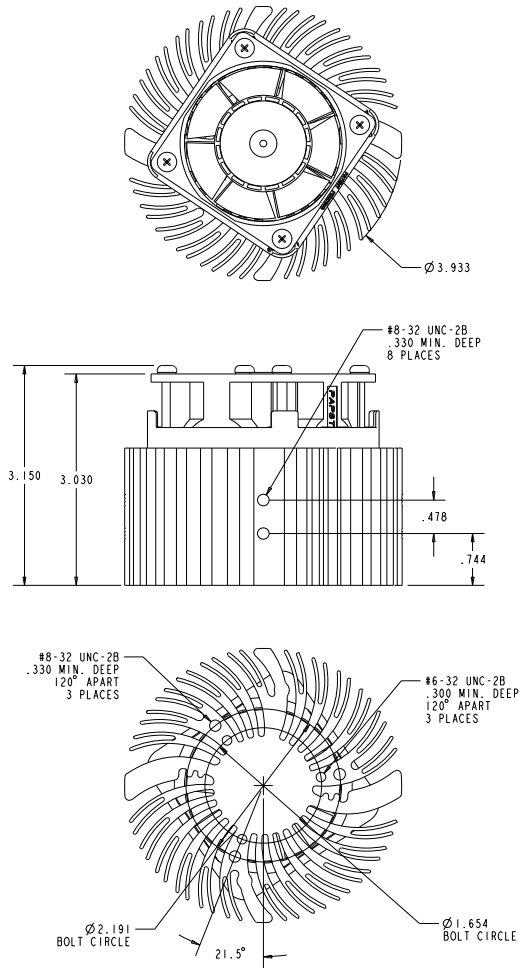
Dimensions shown in inches



Philips SLM technical data

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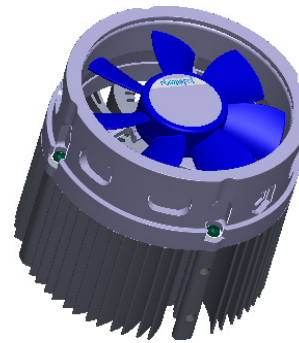
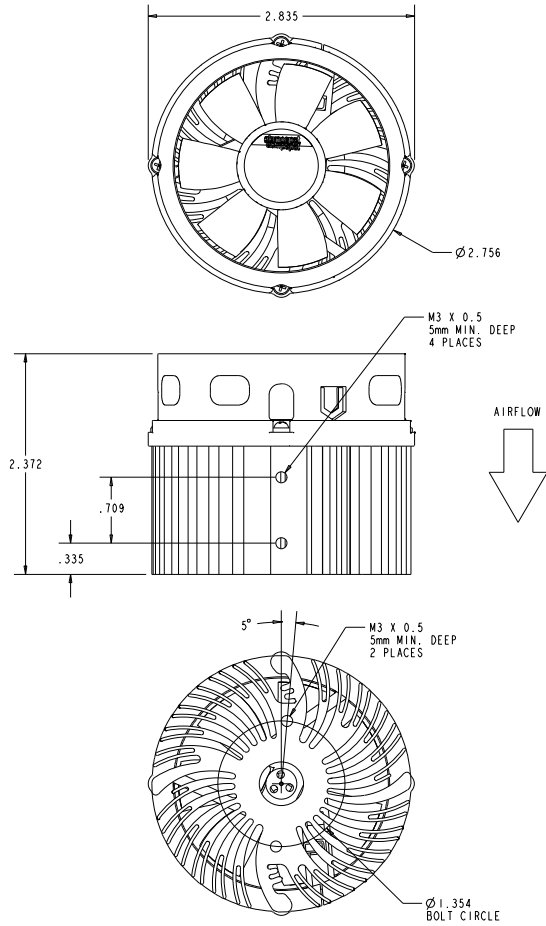
Dimensions shown in inches



Philips SLM technical data

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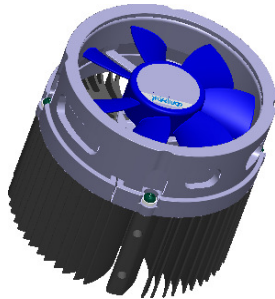
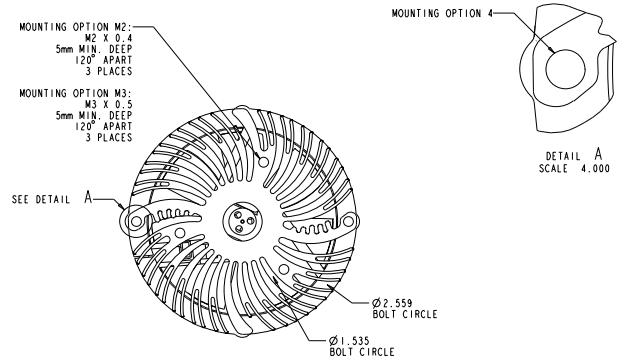
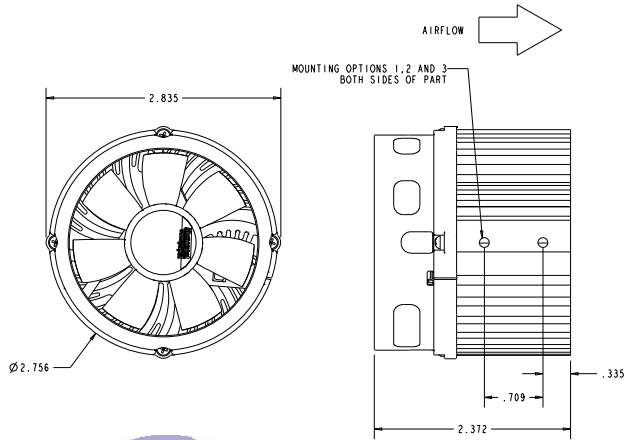
Dimensions shown in inches



Xicato XSM technical data

PG1W-12-60-M3BN

Dimensions shown in inches



MOUNTING OPTIONS TABLE		
MOUNTING OPTION	THREAD	THREAD DEPTH
NONE	NONE	NONE
1	M2 X 0.4	5mm MIN.
2	M3 X 0.5	5mm MIN.
3	#6-32 UNC	0.2" MIN.
4	M3 X 0.5	5mm MIN.
5	OPTION 1 & 4	
6	OPTION 2 & 4	
7	OPTION 3 & 4	

PART NUMBER
PG1W-12-60-XX X X

MOUNTING
M2 - M2 SCREW THREAD
M3 - M3 SCREW THREAD

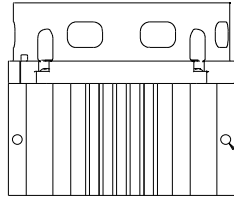
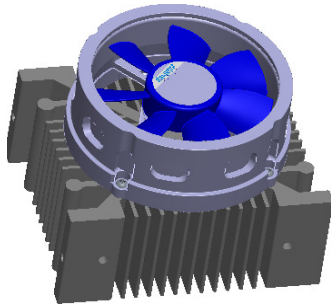
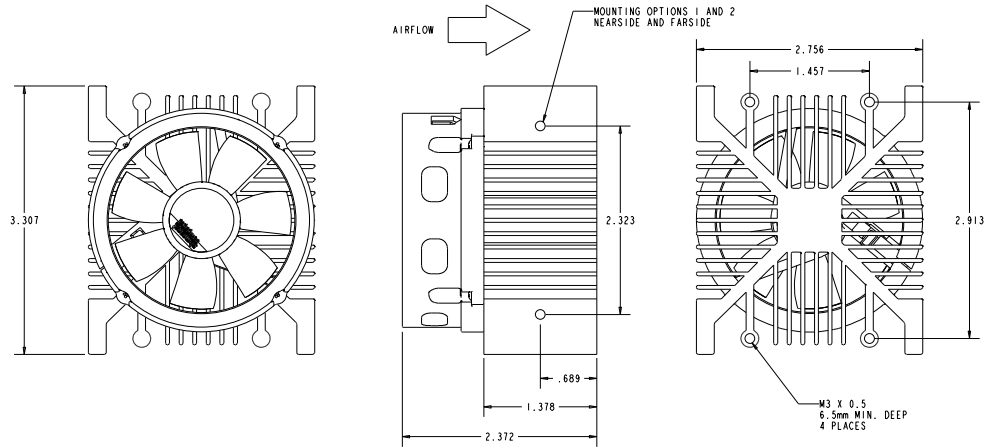
MOUNTING OPTION
SEE TABLE

FINISH
B - BLACK ANODIZED
C - CLEAR ANODIZED

Xicato XLM technical data

PG1W-12-60-L3BN

Dimensions shown in inches



MOUNTING OPTIONS TABLE		
MOUNTING OPTION	THREAD	THREAD DEPTH
NONE	NONE	NONE
1	M3 X 0.5	6.5mm MIN.
2	#6-32 UNC	0.25" MIN.
3	M3 X 0.5	6.5mm MIN.
4	#6-32 UNC	0.25" MIN.

MOUNTING OPTIONS 3 AND 4
NEARSIDE AND FAR SIDE

PART NUMBER
PG1W-12-60-L3 X X

FINISH
"B" - BLACK ANODIZED
"C" - CLEAR ANODIZED

Notes

Notes

Notes



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ebmpapst

The engineer's choice