Cooling Solutions

for the lighting industry.

ebmpapst

The engineer's choice

GREEN TECH

Type		Series	Dimensions	Temperature range	Lifetime	Lifetime
			mm	°C	hours	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)

– Flow simulations using Mentor Graphics FloEFD software

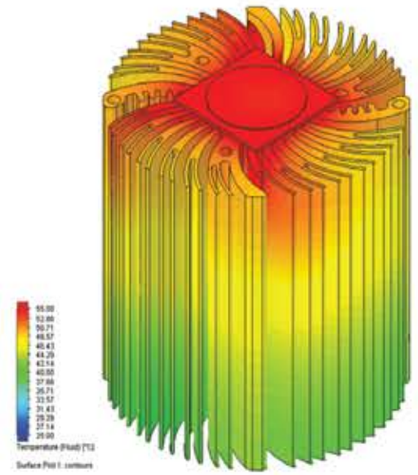
– Design service offered to customers

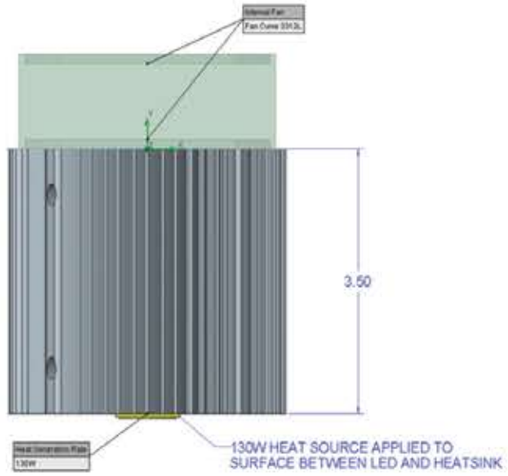
– Ability to optimize active cooling solutions in conjuction with lamp design

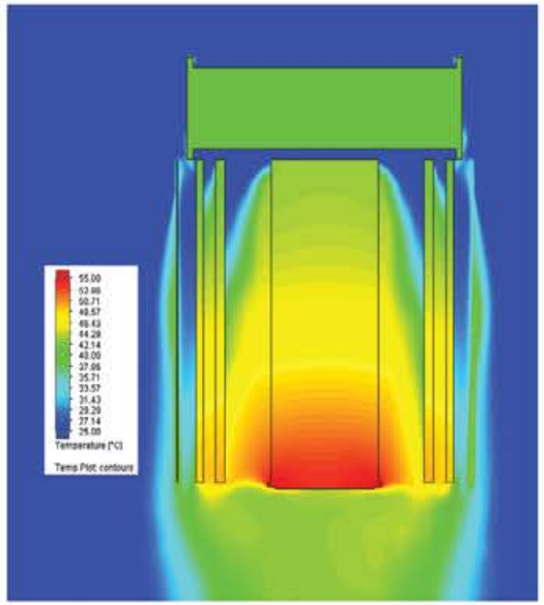
– Predictive analysis of thermal performance and LED junction temperature

– Validation of results using ebm-papst thermal resources

– Accelerates design process for custom applications







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, Xicato light engines and CoBs
- 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

PG1W-12-60-XXXX

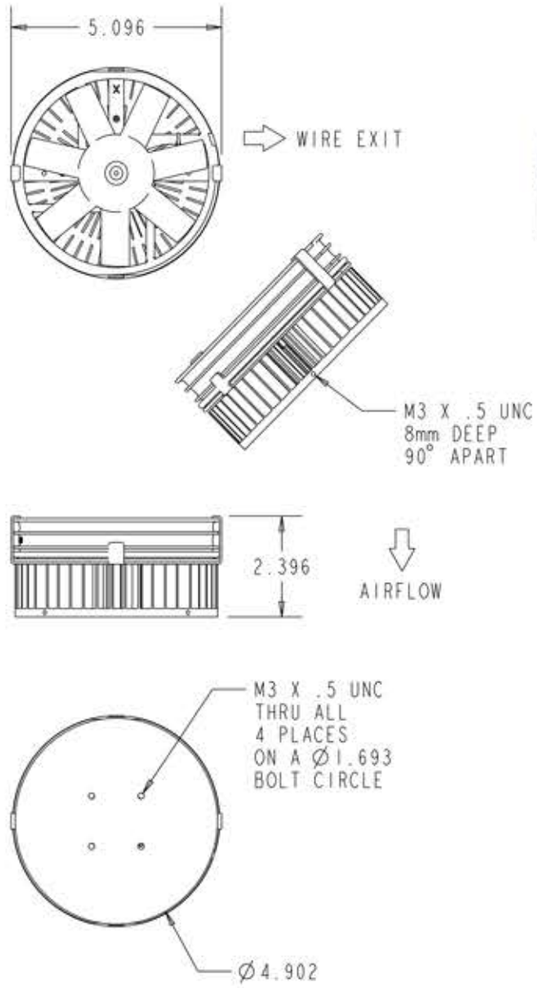
PG1W-12-60-XXXX

Nominal Data

CoB / LED OEM	Type	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)
		VDC	dB(A)	W	rpm	g	W	hours	years	hours	years
Bridgelux Vero 29 High Lumen	PG1W-012-119-12	12	16	150	1200	582	1.1	176,000	20.0	97,500	11
Bridgelux Vero 29	PG1W-012-060-09	12	19	130	3000	672	0.42	137,500	15.7	80,000	9
Bridgelux Vero 10/13/18	PG1W-012-060-13	12	7	60	1800	197	0.18	197,500	22.5	87,500	10
CREE LMH2 High Lumen	PG1W-012-119-10	12	16	150	1200	582	1.1	176,000	20.0	97,500	11
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 Fortimo SLM	PG1W-012-060-06	12	7	50	1800	217	0.18	197,500	22.5	87,500	10
Xicato XSM, XIM, XTM	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

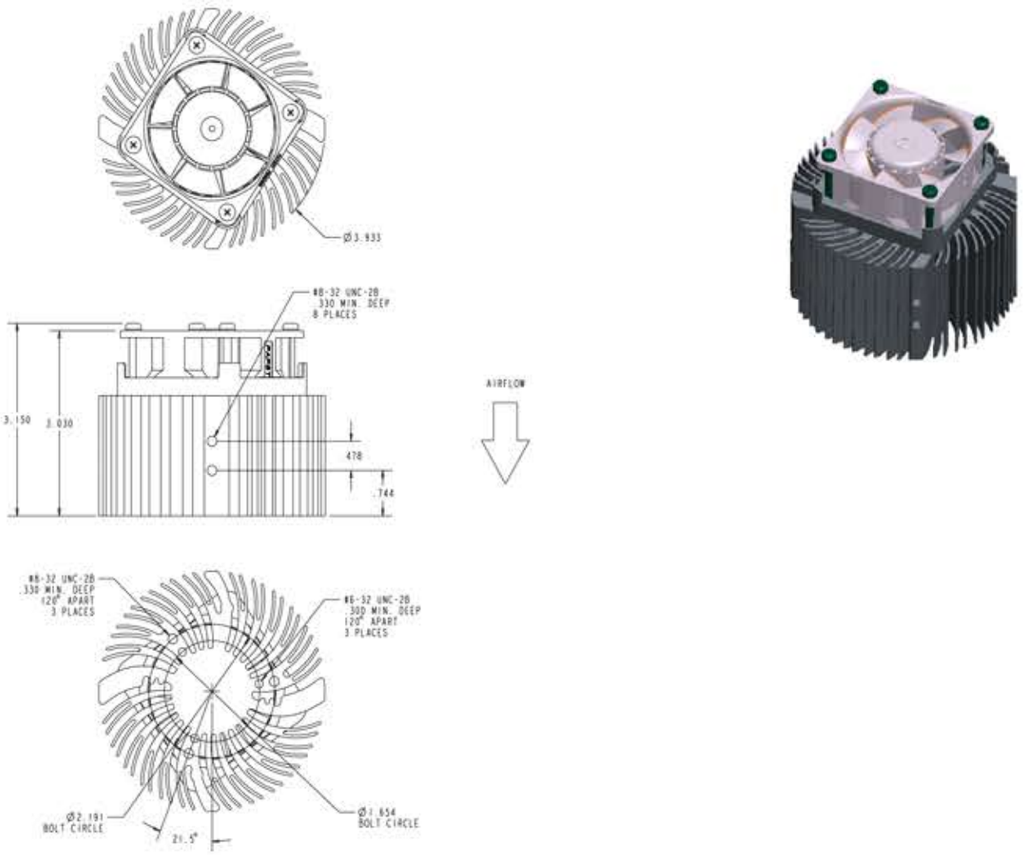
Note: Voltages are based on base fan models. Other voltages available upon request. Lifetime L_{10} per IPC 9591. **Various mounting options available. Refer to data on pages 17-18 of this brochure. *Application dependant.

PG1W-012-119-12 **Bridgelux Vero 29** **Dimensions shown in inches**



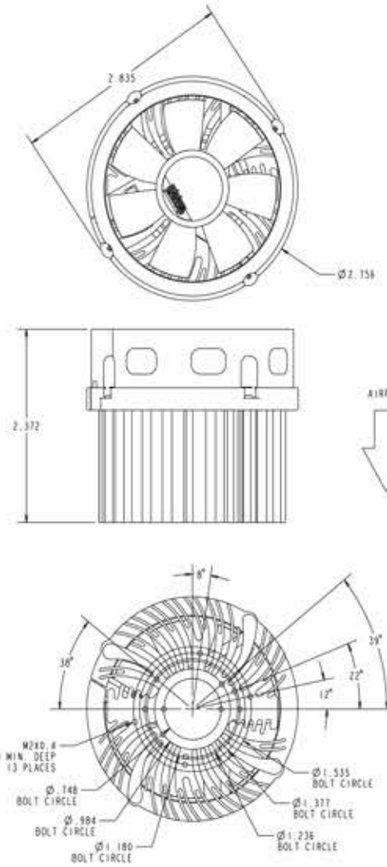
PG1W-012-060-09

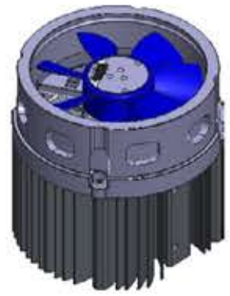
Dimensions shown in inches



PG1W-012-060-13

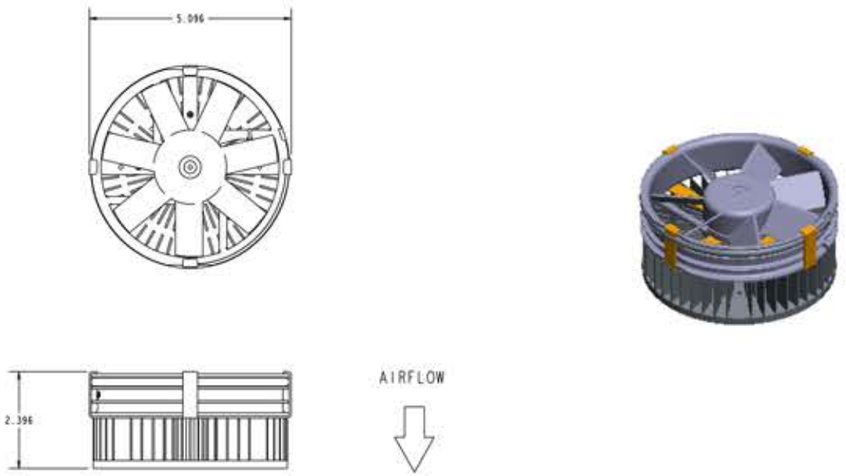
Dimensions shown in inches





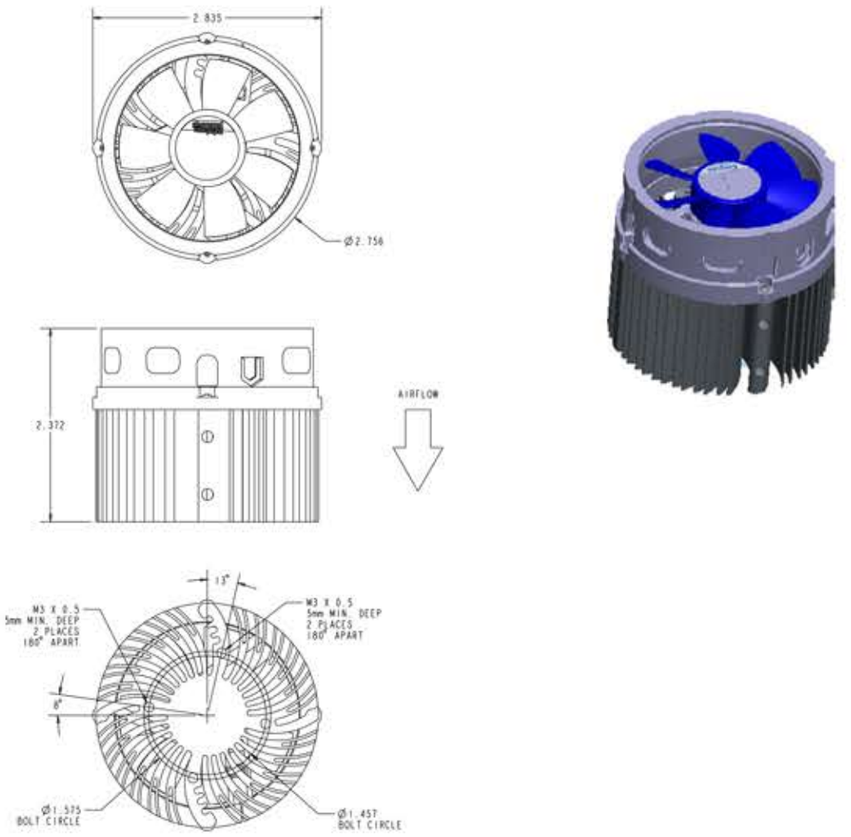
PG1W-012-119-10 **CREE LMH2**

Dimensions shown in inches



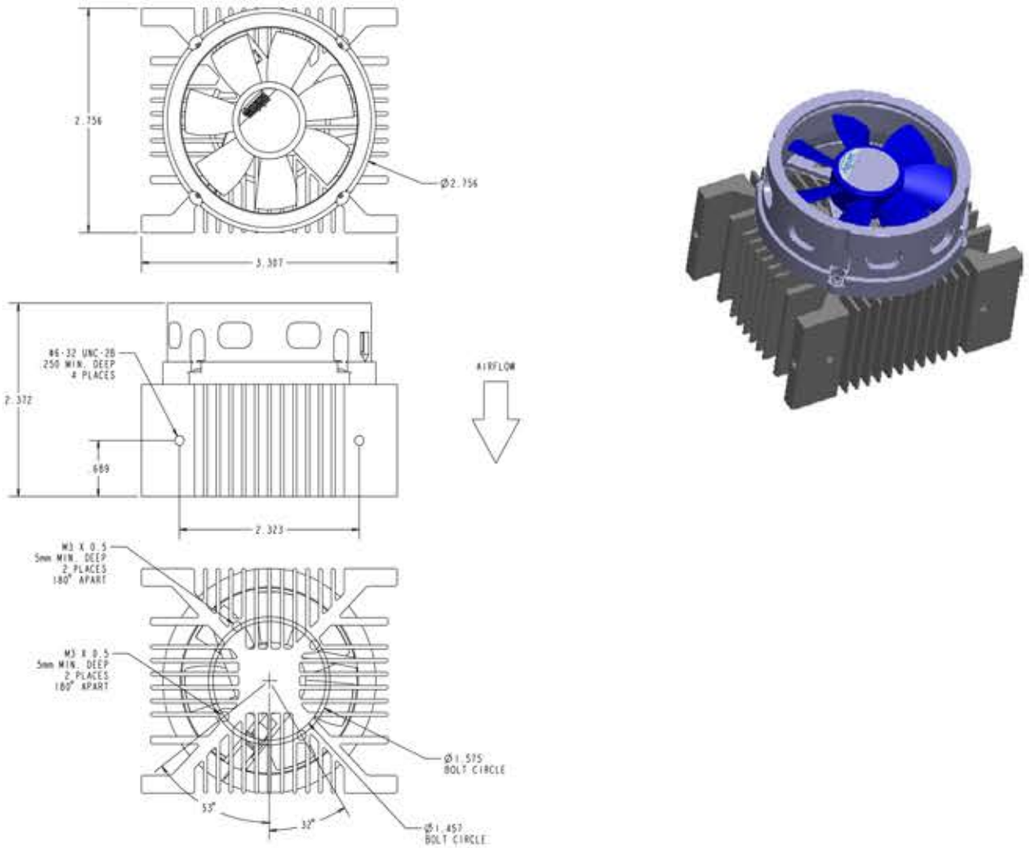
PG1W-012-060-07

Dimensions shown in inches



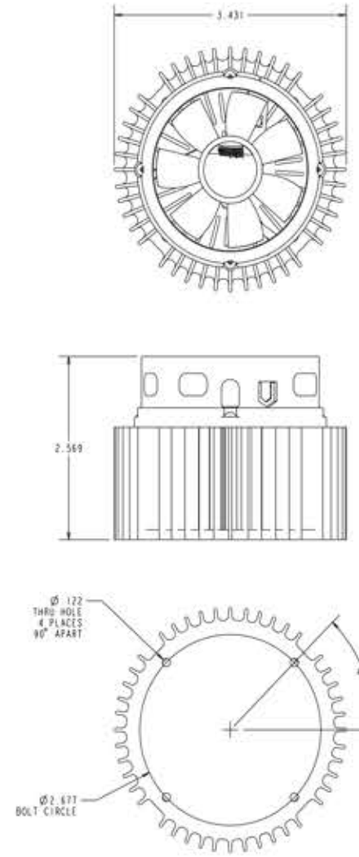
PG1W-012-060-08

Dimensions shown in inches



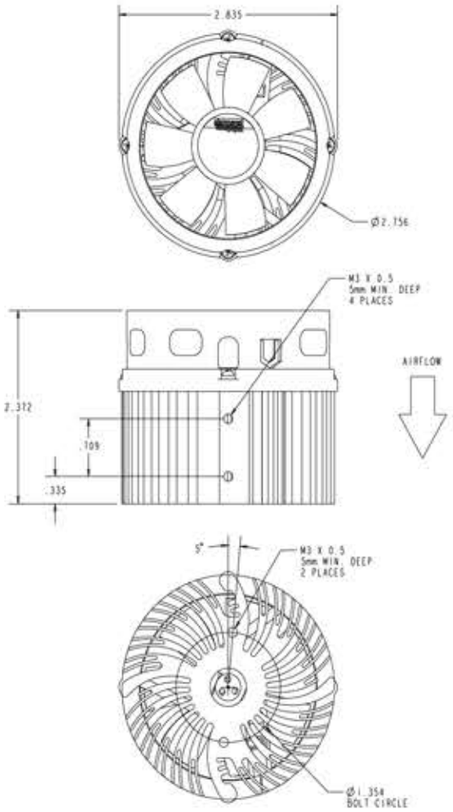
PG1W-012-060-11

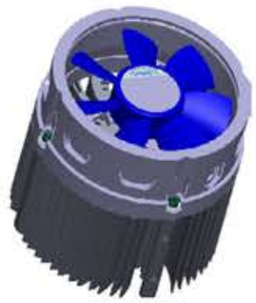
Dimensions shown in inches



PG1W-012-060-06

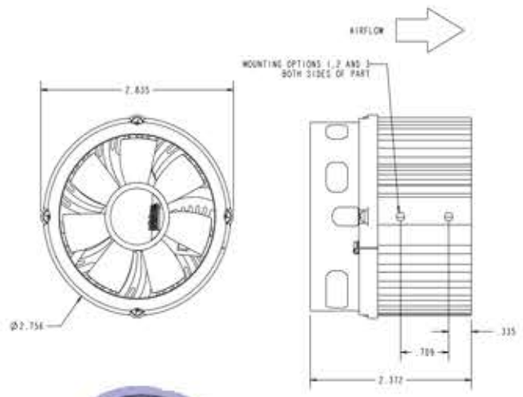
Dimensions shown in inches

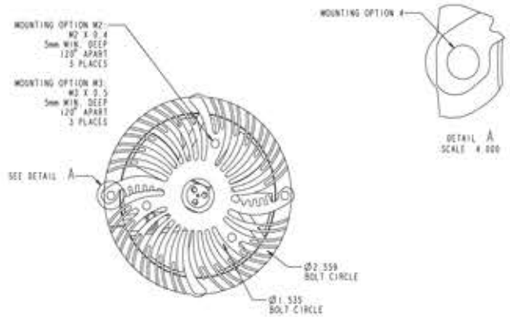


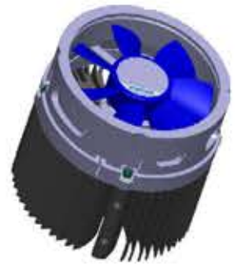


PG1W-12-60-M3BN

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

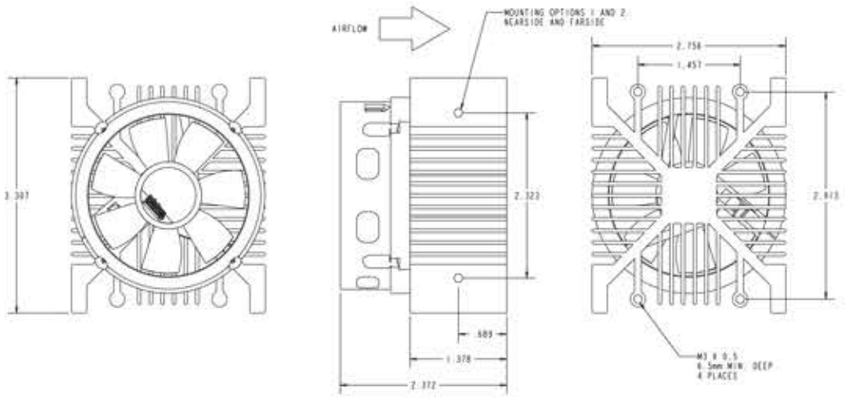
MOUNTING
"M2" - M2 SCREW THREAD
"M3" - M3 SCREW THREAD

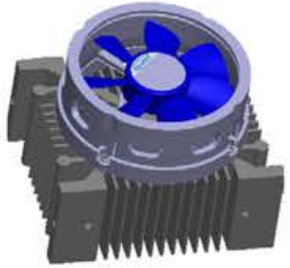
MOUNTING OPTION
SEE TABLE

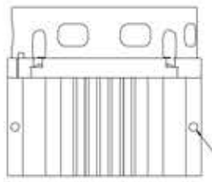
FINISH
"B" - BLACK ANODIZED
"C" - CLEAR ANODIZED

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 FARSIDE

PART NUMBER
PG1W-12-60-L3 X X

MOUNTING OPTION
SEE TABLE

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