

Data Center Cooling



About ebm-papst Inc.



headquarters - farmington, CT

- » 250K sq ft
- » 20 Regional Offices
- » 250 Employees
- » Complete Air Testing Lab On Site
- » ISO 9001 and 14001 Certification
- » Distribution from Farmington (CT), Toronto, and Dublin
- » National Distributor Locations

With offices in major cities throughout North America and Ireland, our highly-skilled and experienced team of professionals is ready to tackle your most difficult air moving challenges and offer solutions that meet your needs. We serve all markets including IT & Telecomm, HVAC, Refrigeration, Gas & Heating, Household Appliances, Industrial, Drive Systems, Transportation, Agriculture, Medical, and more. You can always count on prompt, courteous service. Customer satisfaction is our number one priority.

expert 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 your ordering requirements. To assist you with order management, our customer service department provides automated services such as shipment notifications, reorder notifications, and invoicing.

To find the right air moving solution for your needs, our experienced application engineers are at your service to answer all your product application questions. Our on-site testing lab is available to our customers for product / prototype testing. We offer air flow, noise, environmental (including Salt Fog chambers), and temperature testing. Burn-in ovens are also available.

Our electrical engineering team, with diverse industry and product design backgrounds, provides a full range of services including hardware and software design, analysis and testing, and electronics manufacturing. Some of the services performed in our on-site lab are circuit analysis, reliability and environmental testing, prototype build and testing, test equipment design and build.

value-added services to meet all your needs

ebm-papst, the world's leading source for engineered air movement solutions, provides a "total solution" approach to your cooling requirements using our extensive in-house resources. Custom assemblies are designed by our engineers to your specifications for a wide range of applications. Sheet metal fabrication and finishing / painting is performed on our extensive line of state-of-the-art equipment, ensuring superior quality and maximum flexibility in the manufacturing process. Custom assembly incorporating ebm-papst air movers, custom PCBs, power supplies, electronic filters, air filters, wire harnesses, labeling, fasteners / connectors / accessories, and more is performed on site.

logistics and inventory management programs

We have over 90,000 sq ft of climate-controlled warehousing at our facilities offering real-time inventory transactions and bar-coded inventory. Inventory management programs such as Kanban, demand/pull, safety stock, consignment, and local warehousing can be customized to your requirements.

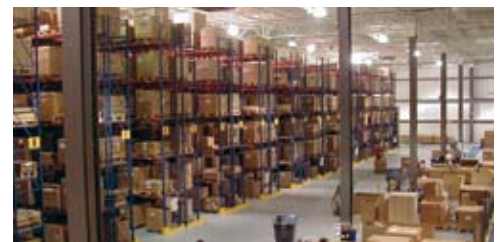


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data center cooling

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Types of Fans and their Function

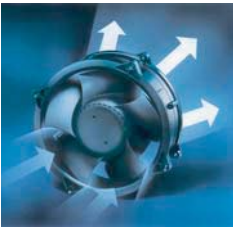
axial fans



High air flow with medium to relatively high pressure build-up

The air flow in axial fans, whose blower wheel is similar to that of a propeller, is conducted to a great extent in parallel to the axis of rotation, in other words in the axial direction. Axial fans with free air delivery at zero static pressure have the lowest power input that rises with increasing counter pressure. Axial fans for the cooling of electronic equipment are mostly equipped with external housing and an electric motor integrated into the fan hub. This compact construction allows space-saving accommodation of all devices; the flange is equipped with mounting holes.

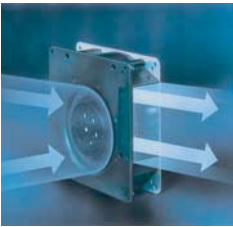
diagonal fans



High flow rate at relatively high pressure

At first glance diagonal fans only differ slightly from axial fans. Intake is axial whereas exhaust is diagonal. Due to the conical shape of the wheel and housing the air is pressurized higher. In direct comparison with axial fans of the same size and comparable performance, these fans are distinguished by the lower operating noise.

radial fans



Limited flow rate at high pressure

Many of the cooling problems that occur can be optimally solved by axial and/or diagonal fans. If for example the required cooling air has to be conducted around an angle of 90 degree symbol or if high pressure is necessary, radial fans are more effective. For your application, ebm-papst offers not only complete radial fans but also motor/blower combinations without external housing.

crossflow blower



High flow rate at low pressure

Crossflow blowers are used above all, for large-surface air flow in appliances. The air flows through the blade roller twice in the radial direction. At the suction point from the outside to the inside and at the exhaust point from the inside to the outside. Whirls form in the roller due to the vanes which guarantee a steady flow of air through the blower wheel.

Fan Technology

All Inclusive Safety

It goes without saying that all ebm-papst fans conform to the approval requirements of the VDE and the standards and regulations of UL and CSA. All fans conform to the UL (Underwriter Laboratories) and CSA (Canadian Standards Association). With few exceptions, our DC fans are designed to meet the requirements of protection class 3 / protection class voltage. ebm-papst fans meet the highest requirements of electrical safety. Depending on the type, they are either impedance protected or equipped with a temperature safety switch, a scheme to prevent locked rotor, alarm function or have speed monitoring and speed control.

Alarm signal for more safety

If your application requires monitored fan operation in addition to speed monitoring, ebm-papst also provides a multitude of varying alarm signals. Depending on the type of fan in question, the signal is either static, already evaluated or interface-compatible. The alarm signal output provides reliable long term monitoring and status signal when critical operating conditions evolve.

Electronic Tacho

You wish to be informed about the current fan speed at all times? ebm-papst has fans with an integrated “electronic tacho” which registers the actual value of the fan speed. Via an integrated sensor, the fan generates speed-dependent signals which can be directly utilized. Depending on the number of poles of the motor (2, 4 or 6 pole) 1, 2 or 3 pulses per revolution are generated.

Speed setting via interfaces

With a wide range of DC fans with separate control input, ebm-papst provides an alternative to the NTC controlled types of fans. They are especially suitable for systems and units which already have standard interfaces for varying speed via internal switching and control circuits. The main applications are units which demand load-dependent individual speed profiles or systems with stand-by minimum cooling requirements and varied speed increase at varying power peaks.

Sturdy Construction - in metal or plastic

Fans of metal construction: Sturdy and indestructible. The housing is made of an aluminum alloy whereas the metal surfaces that are subject to corrosion are permanently protected by black, impact and abrasion resistant electrophoretic baked enamel. This particular version is recyclable. Fans with fiberglass reinforced plastic housing and impeller - excellent stability and low weight distinguish this highly efficient fan concept. The metal housing and plastic impeller combine the advantages of both types of design.

Temperature-controlled fans

Fans with temperature-controlled speed have particularly quiet cooling characteristics. Thanks to IC technology, they adapt their speed to the current cooling requirements which results in a drastic reduction of noise in most operating modes. A temperature sensor provides the fan with thermal information either externally via a single lead or integrated into the hub of the fan.

TURBOFAN

The DC fans with the 3-phase EC motor technology for exact speed control and high power margin. The drive and control electronics of the TD motors is pre-wired and already integrated in the fans.



Accident Prevention

The turning rotor and the high speeds that are sometimes involved mean that our fan products carry an inherent risk of injury. They may only be operated after correct installation and with suitable protective facilities (e.g. with a guard grille). More information can be found online at:

www.ebmpapst.us/safetyguidelines.htm



Selecting the Correct Fan

1. Dissipated Heat

A large amount of the energy consumed by electrical and electronic devices is converted into heat. In selecting the correct fan, therefore, it is important to determine the dissipated heat that must be removed. The electrical power consumption of the unit to be cooled, often represents a suitable value for this purpose.

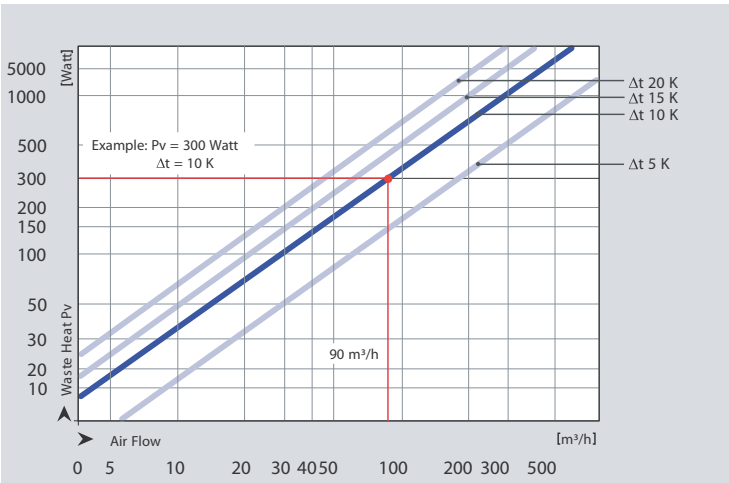
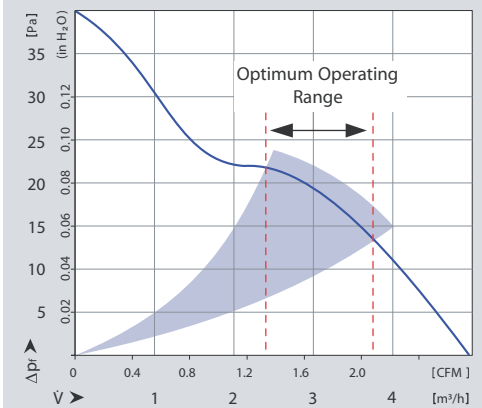
2. Permissible Temperature Rise

The airflow which the selected fans is required to generate is determined by the dissipated heat and the permissible rise (ΔT) of the cooling airflow (from entry to exit of the device to be cooled). The max. allowable ΔT depends greatly on the temperature sensitivity of the individual device components. $\Delta T = 5K$ means that the average air flow leaving the device to be cooled may only be $5^{\circ}C$ warmer than the ambient temperature (a large volume of air is required for this purpose). A lower airflow rate is sufficient if a higher temperature difference (e.g. $\Delta T = 20k$) can be tolerated.

3. Required Cooling Air Flow

In the below diagram a horizontal line is drawn from the dissipated heat to intersect with the selected ΔT line. To obtain the required value for the cooling air flow, the diagram-formula is as follows:

$$\dot{V}[\text{m}^3/\text{h}] \approx 3 \cdot \frac{P_v [\text{w}]}{\Delta T [\text{k}]}$$



4. Optimum operating range

The required fan, however, must also be able to deliver a suitable static pressure Δp_f , in order to force the cooling air through the appliance. A fan must therefore be selected that provides the required airflow performance within its optimum operating range.

5. Fan selection

If the requirements of an application are fulfilled by more than one fan, the noise level, space requirements, economy and ambient conditions will assist in making the final choice.

Service Life

Long Service Life

The bearing system plays a vital role both in the long life time and quietness of equipment fans. The SINTEC compact bearing provides most of the equipment fans with a proven bearing system. Constant low noise during the entire operating time and considerably lower shock sensitivity are the outstanding features of this bearing technology. Also, with regard to temperature endurance, Sintec compact bearings can be used without problems in most applications. Despite the slightly higher noise and shock sensitivity of ball bearings, this bearing technology should be given preference when exposed to extreme thermal and adverse application conditions (e.g. extreme environmental conditions, critical installation position, etc.). The service life data provided in this catalog is based on extensive service life tests and mathematically / scientifically proven service life calculations. Our product descriptions are continuously updated with all relevant data obtained from long-term tests.

Service Life L_{10} (40° C) and L_{10} (Tmax)

The values given in the first two columns have been derived from intensive, internal service life endurance tests, in which our products are operated in various positions at 40°C and 70°C until they fail. A fan is deemed to have failed when it deviates from its defined airflow and speed values, or when the operating noise becomes noticeable. Such tests can take several years before a representative number of failures have been registered.

Test results are presented in a diagram and the service life of the product L_{10} at the temperature tested is determined on the basis of the Weibull distribution. These tests have given us years of experience of the way various design parameters and temperatures can affect the service life of a product. Service life at various temperatures data for new products can be stated with a very high degree of precision on the basis of tests, product specifications and of commonalities in the design of the product.

New: Life Expectancy $L_{10\Delta}$ (40° C)

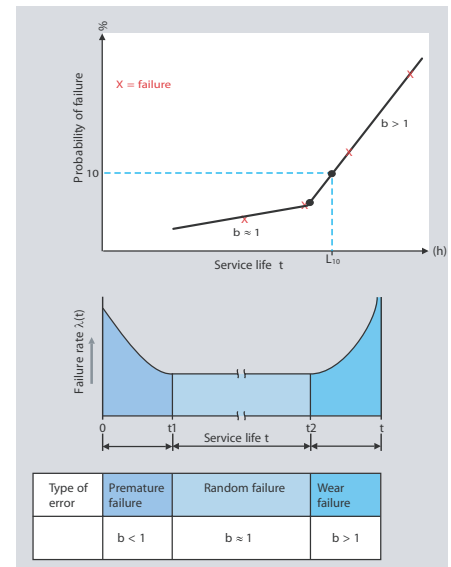
The new third service life column states the expected service life L_{10} . This value is based on the calculation methods conventionally applied in the compact fan market. The foundations for the service life values are our service life endurance tests at high ambient temperatures. The service life at temperatures below the test temperatures is calculated using fixed factors. This method produces much higher service life values, especially at room temperature.

Summary

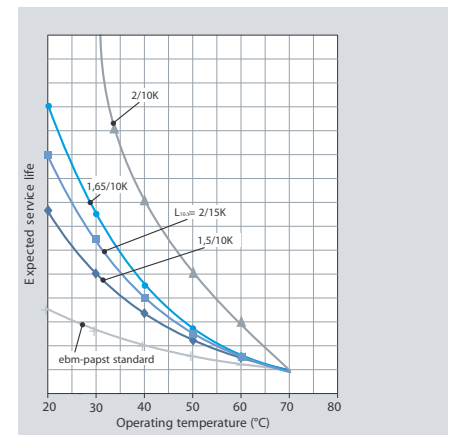
The value given for the life expectancy $L_{10\Delta}$ should help the user to compare our service life figures with those of other manufacturers. The service life L_{10} in the first and second columns is the service life verified by years of practical testing of our products.

Noise	Noise	Sintec-Sleeve Bearings Ball Bearings	Power Input	Nominal Speed	Temperature Range	Standard Life (60° C) 40000 hours (Standard)	Standard Life (40° C) 40000 hours (Standard)	Product Life expectancy Life (60° C)	Curve
dB(A)	Bel	□ ■	Watt	min ¹	°C	Hours	Hours	Hours	
5	< 3	□ ■	0.2	6 000	-10...+70	45 000 / 14 000	45 000	45 000	1

Example of service life figures on selected catalog pages.



Bathtub curve and Weibull distribution.



Example of the influence of factors from various manufacturers on the expected service life.



Fans in an endurance test cabinet at ebm-papst St. Georgen, 1500 fans are operated in temperature cabinets until they fail.

IT Product Overview

IT product cooling for data centers

For many companies, the demands of cooling electronic IT components is constantly increasing. As the technology becomes smaller and more powerful, the consumption of energy increases, consequently emitting more heat. Component overheating and heat build-up within enclosures are the primary causes for failure, and if heat is not continuously removed may result in reduced service life, severely impacting ROI and operating performance.

ebm-papst understands the complexity of your company needs for continuous and reliable performance of electronic components in the data center environment. To meet the needs of company demands, ebm-papst offers thousands of off-the-shelf and custom solutions all incorporating innovative technology that enables the optimal performance needed to match the ever increasing demands of modern IT components.

innovation and strength

For decades, ebm-papst fans have defined standards and set new benchmarks for cooling electronic and IT components quickly and powerfully, yet reliably and efficiently. Our research and design engineers work every day to develop innovative technologies and new ideas, examine practical requirements and listen to the needs of our customers. Investments in research and development are more than a mere matter of course; they are the foundations on which our success is built. Our superior knowledge data center industry and applications have allowed us to develop highly specialized solutions.

From the finest detail in the mechanics of the compact housing to the ingenuity of our electronically commutated motors, we have scrutinized every component until the best performance possible was achieved. Only if all aerodynamic factors work together in perfect synthesis can the best possible performance be attained, which you are entitled to expect from our products. At ebm-papst we see ourselves as a technological trendsetter, working every day on innovations that redefine the benchmark of what is possible. Even if that means that we have to exceed ourselves.



DC Product



- DC fans with electronically commutated external rotor motor and fully integrated commutation electronics
- Input Voltages (VDC): 5, 12, 24 or 48
- Air Flows (CFM): 2 to 1,130
- Sizes: 1 to 11 inches (25 to 280 mm)

new extension of DC fans - the S-Force generation

The overall package of our new generation of compact fans is divided into five series with sizes ranging from 80 to 172 mm. Each series represents the benchmark in its class with respect to air performance and pressure build-up while achieving optimum motor efficiency and long service life.

At the heart of the S-Force series are highly compact single phase and three phase multi-pole motors with wear-free electronic commutation. Their outstanding features include high efficiency with low dissipated energy, maximum efficiency and intelligent function and above all - power. The new motors attain a peak power of more than 300 watts, equivalent to a 500% increase compared to predecessors of the same size. With intelligent equipment features, the EC compact generation is perfectly suited for individual requirements. Optional features include speed monitoring, closed loop speed control, operating monitoring, integrated or external temperature sensor, or microprocessor controlled motor management for software controlled fan operation.

	<i>Size</i>	<i>Max. Air Flow</i>	<i>Norm. Voltage</i>	<i>Volt. Range</i>	<i>Sound Pressure</i>	<i>Power Input</i>	<i>Norm. Speed</i>	<i>Max. Ambient Temp.</i>	<i>Service life L₁₀ at 40°C</i>	<i>Service life L₁₀ (T_{max})</i>	<i>Life expectancy L_{10Δ} (40°C)</i>	<i>Weight</i>
Series	mm	CFM	VDC	VDC	dBA	Watts	rpm	°C	Hours	Hours	Hours	lbs.
8200J	80	131	12, 24, 48	6 to 58	71	39	14,000	70	55,000	27,500	110,000	.44
3200J	92	165	12, 24, 48	6 to 58	73	50	13,000	70	65,000	32,500	130,000	.50
4100N	120	335	24 or 48	16 to 36	78	120	11,000	75	57,500	25,000	115,000	.86
5300	140	394	12, 24, 48	8 to 72	79	144	9,200	70	70,000	35,000	140,000	1.98
6300	172	559	12, 24, 48	8 to 72	75	150	9,200	70	70,000	35,000	140,000	2.0

Contact Engineering for specific part numbers and values

Please reference page 12-13 for accessories

Visit www.ebmpapst.us for complete family information

Rack Cooling Overview

rack cooling for data centers

Data center heat loads have increased dramatically as more components are squeezed tighter into densely packed rack space. Excess heat in a server room adversely effects equipment performance, shortens equipment life-spans, and is the primary reason for downtime. Rack cooling ventilation designs should reduce hot spots and provide adequate cooling to every part of the data center. Hot spots that are not properly cooled result in temperatures that exceed the recommended conditions for equipment reliability and performance, caused by improper airflow and poor circulation. Effective cooling techniques must be employed so that the heat can be dissipated as efficiently as possible and close to the source. This calls for the most innovative and efficient solutions to meet the challenging needs of data center applications.



maximum performance, custom solutions

Our fans and blowers for rack cooling in data centers are available in a wide range of AC and EC-Systems™ technology and can direct cooled air to where it can be used most productively and efficiently. Our compact fans are high performing, able to handle high backpressures, and can be intelligently controlled and adapted to specific requirements, all while promising long service life and maintenance-free operation. Our wealth of value-added capabilities and expertise allows us to customize solutions to meet your unique data center needs.

Also, check out our EC integrated axial fans for HVAC cooling for more product selections incorporating our signature EC-Systems™, suitable for rack cooling in data centers.

AC Product



- Input Voltages (VAC): 24, 115, 230
- Air Flows (CFM): 15 to 600
- Sizes: 3 to 11 inches (76 to 280 mm)
- External rotor shaded-pole motors and compact designs

Our world renowned ebm-papst AC fans are used when DC voltage is not available. The AC range of fans is based on experience gained from decades of research, millions of units in series production and competence in innovation of a world-wide technological leader. AC fans are available in a variety of sizes with either air exhaust or air intake over struts. Fans with ball bearings are available with pin connection or free-hanging leads. The fan blades are directly attached to the external rotor motor thus combining both high performance and long life.

	<i>Size</i>	<i>Max. Air Flow</i>	<i>Nom. Voltage</i>	<i>Frequency</i>	<i>Sound Pressure</i>	<i>Power Input</i>	<i>Nom. Speed</i>	<i>Max. Ambient Temp.</i>	<i>Service life L₁₀ at 40 °C</i>	<i>at T_{max}</i>	<i>Weight</i>
Series	mm	CFM	VAC	Hz	dBA	Watts	rpm	°C	Hours	Hours	lbs.
8000N	80	35.9	115 or 230	50/60	35	12.5	3,300	95	62,500	27,500	1.08
3000	92	52.4	115 or 230	50/60	42	12	3,200	90	62,500	37,500	.93
3900	92	41.2	115 or 230	50/60	40	11	3,150	80	70,000	27,500	.62
4000N	119	105.9	115 or 230	50/60	51	19	3,100	90	60,000	30,000	1.21
4000Z	119	105.9	24 or 115	60	45	18	3,100	85	52,500	30,000	1.19
W2S130	ø130	250.1	115 or 230	50/60	62	47	3,250	80	---	---	2.44
W2E142	ø142	230	115 or 230	60	57	28	3,300	75	---	---	1.98
W2E143	ø143	294.2	115 or 230	60	60	29	3,300	75	---	---	2.20
W2E200	ø200	606	115 or 230	60	61	80	2,800	65	---	---	4.41
W2E250	ø250	1,100	115 or 230	50/60	73	200	2,700	50	---	---	4.00
W2E200A	ø200	600	115 or 230	50/60	62	77	2,600	80	---	---	3.13
W2E250A	ø250	1,100	115 or 230	50/60	71	160	2,600	60	---	---	3.13
W2E300A	ø300	2,200	115 or 230	50/60	76	350	3,000	40	---	---	7.00
W4E315A	ø315	1710	115 or 230	50/60	64	120	1,120	70	---	---	5.29
W4E330A	ø330	1840	115 or 230	50/60	63	145	2,280	70	---	---	5.51

Contact Engineering for specific part numbers and values

Please reference page 12-13 for accessories

Visit www.ebmpapst.us for complete family information

Tubeaxial Accessories



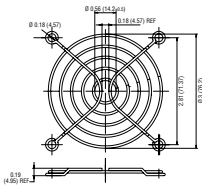
Everything that you need for your fan. ebm-papst provides an extensive range of accessories for optimum fan operation: From temperature sensing for speed controlled fans to finger guards of all types, switched-mode power supply, connecting cable, filter, screens, spacers and assembly parts.

In addition to the accessories and assembly parts listed in this brochure, ebm-papst also supplies numerous special parts for fan operation. The sales experts at ebm-papst will be happy to assist you in your inquiries concerning fan assembly and application.

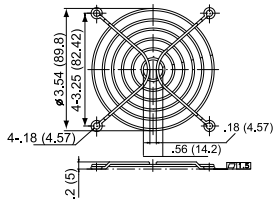
Fan Series	Metal Finger Guard	Plastic Finger Guards		Filter with Foam Pad	Plug & Cord Set	Shock & Vibration Mount	Mounting Screw Clip	Metal Mesh Filter	Screen	Bracket
		Barbed	Thru Holes							
8200J	LZ22N	LZ32-3	LZ32-2							
8000N	LZ22N	LZ32-3	LZ32-2, LZ32P	10020-1-5170	LZ120, LZ126	2678-2-2945		LZ60-8		
3000	LZ23	LZ23-3	LZ23-2	10023-1-5170	LZ120, LZ126					
3900	LZ23	LZ23-3	LZ23-2	10023-1-5170	LZ120, LZ126					
3200J	LZ23									
4000N	LZ30	LZ30-6	LZ30-5, LZ30P	10021-1-5170	LZ120, LZ126	2678-2-2945	LZ210	LZ60	LZ40N	LZ40-1
4000Z	LZ30	LZ30-6	LZ30-5, LZ30P	10021-1-5170	LZ120, LZ126	2678-2-2945	LZ210	LZ60	LZ40N	LZ40-1
4100N	LZ30	LZ30-6	LZ30-5, LZ30P	10021-1-5170	LZ120, LZ126	2678-2-2945	LZ210	LZ60	LZ40N	LZ40-1
W2S130	09498-2-4039 50950-2-4039									
5300	LZ53									
W2E142	03749-2-4039 50950-2-4039				01434-4-6711 01477-4-6711					
W2E143	50952-2-4039				01434-4-6711 01477-4-6711					
6300	TBD									
W2E200	78128-2-4039									
W2E250	09418-2-4039									

Tubeaxial Accessories

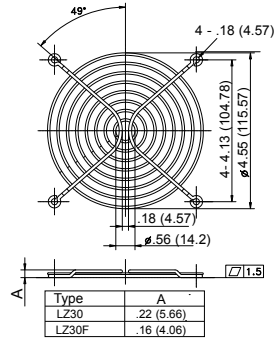
LZ 22 N Series 8000



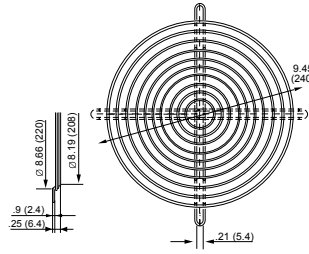
LZ 23 Series 3000



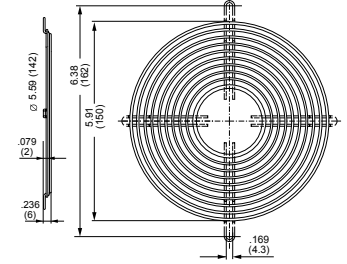
LZ 30 / LZ30 F Series 4000/9000



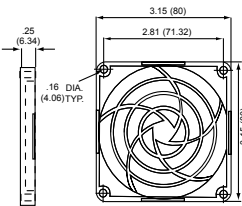
78128-2-4039 Series W1G200/W2E200



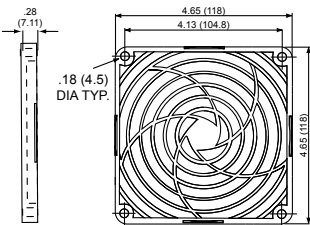
50950-2-4039 Series W2E142



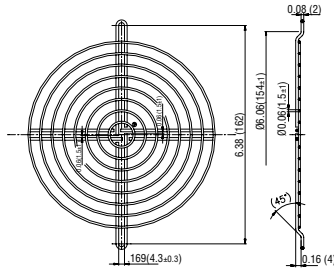
LZ 32 P Series 8000



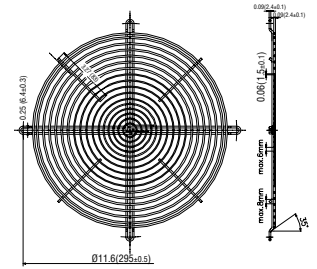
LZ 30 P Series 4000



9498-2-4039 Series W2S130

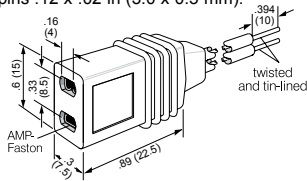


9418-2-4039 Series W2E250



LZ 120

Connecting cable with molded plug. (PVC, black). Stranded wires with multi-core cable ends. For all types of fans with flat pins .12 x .02 in (3.0 x 0.5 mm).

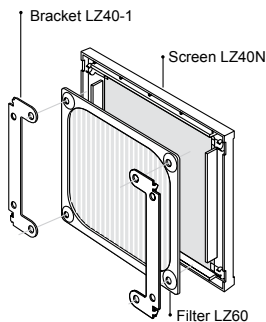


Type	Cable Length in. (mm)	Pins
LZ120	24 (610)	.02 (.5)
LZ126	39.4 (1000)	.02 (.5)

Additional versions are available on special order

LZ40 N / LZ 40-1 / LZ 60

LZ40N of black, fiberglass reinforced plastic with inserted aluminium wire mess LZ60. Mounting with brackets LZ40-1.



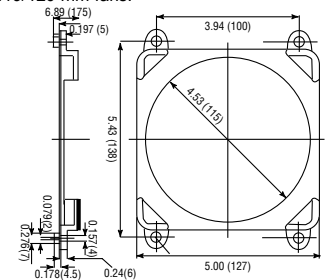
LZ 210

Screw clip of hardened steel. For mounting fans with threaded pin 6-32 UNC and/or 3.5 DIN 7970.



2678-2-2945

Plastic shock and vibration mount for 119/120 mm fans.



HVAC Product

future trends, a green promise

Heating and cooling management is of vital importance in maintaining the efficiency and integrity of a data center. The overall design of the data center must be equipped to meet the increasing high-performance requirements for both current and future trends, all while delivering on a promise for a green design and staying within budget. As any IT or Design professional knows, only optimal cooling of components and air conditioning of the data center environment reduces energy consumption, increases system availability and enables existing components to reach capacity efficiently and effectively. At ebm-papst, we can help meet these stringent requirements.

Today's data center environments require more than 1 kw of power per 10 square feet, and to remove this excess heat, demands a well planned air moving design. A well planned design realizes a few locations will need to be kept particularly cool while keeping an entire area cool. This dilemma can easily be solved by using sensors that constantly capture air and processor temperatures, used to automatically regulate fan speeds and cool system power, allowing systems to not run continuously at full power.

EC control when you need it, where you need it

EC control delivers results - excellence in efficiency, sound control, system management and operating/capital cost savings - and this combination is what ebm-papst specializes in. EC stands for Electronically Commutated. EC motors are essentially DC motors with integrated AC to DC conversion. The EC motor compares to the direct current shunt-wound motor but the magnetic field is generated by permanent magnets inside the rotor. EC motors can be easily controlled, are maintenance-free, offer outstanding efficiency and have a considerably long service life. The variable speed range is possible with EC-Systems™ which makes using a multitude of models a thing of the past. In terms of pressure build-up, air performance and low noise, our products were designed to meet the toughest of specifications; the specifications data centers require.

Our fans, incorporated with EC-Systems™ are programmed to respond automatically to both reduced loads and temperatures by reducing its speed. If condensers with EC incorporated



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technology need more capacity, for instance, it can simply find it by increasing the speed of the fan - something traditional condensers cannot do! This is the type of dynamic cooling needed - sensors constantly capture air and processor temperatures, the results are used to automatically regulate fan speeds and cooling system power allowing the cooling system to run continuously and only at full capacity when needed. EC-Systems™ technology allows for communication between operating units which ultimately enhances total cooling efficiency. This ensures that units are not countering each other by dehumidifying while others are humidifying to direct specific cooling to the heat zone, thus improving the energy efficiency of the data center. By simply dropping the fan speed by 20%, we power consumption by 50%. With a multitude of EC-Systems™ enhanced products to choose from, we can help our customers to develop the perfect data center design.

EC, the first choice for HVAC applications

EC motors are increasingly the first choice when it comes to delivering energy-savings and quiet drive solutions for fans. Our axial fans with incorporated EC-Systems™ technology are appropriate for condensers, chillers, evaporators, power exhaust systems, and rooftop units. Multiple fans can be modulated together for highest efficiency at variable load performance.

Our Radial Backward Curved fans with EC incorporated technology are appropriate for evaporator fan for direct cooling, in-room-cooling systems, power exhaust, energy recovery ventilators (ERV), fan coil units, supplementary cooling systems, CRAC (Computer room air conditioning), CRAH (Computer Room Air Handling), unit cooling and Air Handling Units. The choice is simple, ebmpapst EC-Systems™ incorporated fans and blowers are the best solutions that deliver the results you need for your data center applications.



EC Radial BCMI



- Sizes: \varnothing 120 to \varnothing 630
- Air Flow (CFM): 250 to 9,593
- Input Voltages (VAC): 100, 230, 277, 400, 480
- Feature integrated electronics, extremely low noise and minimal heat generation

ebm-papst EC equipped Backward Curved Motorized Impellers provide excellent aerodynamic efficiency without complicated and costly scroll housings. Their space-saving design provides for a completely integrated, dynamically balanced motor and impeller to assure long-term, maintenance-free operation. The impellers mount easily in any orientation and are completely speed controllable. They are the ideal solution for telecommunication and roof ventilation systems due to their dimensions and capabilities.

Series	Size mm	Max. Air Flow CFM	Nom. Voltage Range VAC	Frequency Hz	Max. current draw A	Power Input Watts	Norm. Speed rpm	Sound Pressure dBA	Max. Ambient Temp. °C	Weight lbs.
R3G133	\varnothing 133	264.9	230	50/60	.80	47	4,670	81	60	2.21
R3G175	\varnothing 175	403.2	230	50/60	1.30	67	3,900	72	60	2.65
R3G190	\varnothing 190	429.7	230	50/60	2.50	70	2,700	68	60	2.76
R3G220	\varnothing 220	585.6	230	50/60	2.50	64	2,780	70	60	3.09
R3G250	\varnothing 250	1,100.6	400	50/60	1.90	315	3,400	80	40	9.9
R3G280	\varnothing 280	1,460	277	50/60	4.20	300	2,500	76	40	11
R3G310	\varnothing 310	2,030	277	50/60	2.10	505	2,590	78	60	9.70
R3G355	\varnothing 355	2,260	277	50/60	4.20	435	1,940	76	60	12.79
R3G400	\varnothing 400	2,207	277	50/60	4.20	420	1,520	74	60	13.67
R3G450	\varnothing 450	2,283	277	50/60	9.8	300	1,100	71	60	15.21
R3G500	\varnothing 500	6,356	480	50/60	8.50	1,850	1,700	79	60	48.51
R3G560	\varnothing 560	7,592.7	480	50/60	9.20	1,900	1,510	81	60	57.33
R3G630	\varnothing 630	9,593.9	480	50/60	8.4	2,000	1,200	79	60	61.74

Contact Engineering for specific part numbers and values

Please reference page 18-19 for accessories

Visit www.ebmpapst.us for complete family information

EC Axial



- Sizes: \varnothing 200 to \varnothing 990
- Input Voltage (VDC and VAC): 24 or 48; 100, 277, 380, 480
- Air Flows (CFM): 641 to 18,305
- Use as little as 1/3 the energy of industry standard fans

	Size	Max. Air Flow	Nom. Voltage Range	Volt. Range	Power Input	Current Draw	Nom. Speed	Sound Pressure	Max. Amb. Temp.	Weight
Series	mm	CFM	VDC	VDC	Watts	A	rpm	dBA	°C	lbs.
1G200	\varnothing 200	641	24 or 48	16-57	55	2.60	2,950	60	60	3.3
1G250	\varnothing 250	1130	24 or 48	16-57	105	5.00	2,750	70	60	3.5
1G300	\varnothing 300	1,442	24 or 48	16-57	90	4.00	1,800	65	60	4.8

	Size	Max. Air Flow	Nom. Voltage Range	Frequency	Power Input	Nom. Speed	Sound Pressure	Max. Amb. Temp.	Weight
Series	mm	CFM	VAC	Hz	Watts	rpm	dBA	°C	lbs.
3G250	\varnothing 250	1,177	100-277	50/60	175	3,050	71	60	5.3
3G300	\varnothing 300	1,295	100-277	50/60	125	1,790	64	60	5.9
3G315	\varnothing 315	2,000	100-277	50/60	170	1,670	65	60	6.4
3G330	\varnothing 330	2,000	100-277	50/60	170	1,630	65	60	6.4
3G350	\varnothing 350	2,200	100-277	50/60	170	1,600	66	60	6.4
3G400	\varnothing 400	3,200	200-277	50/60	390	1,650	69	60	11.47
3G450	\varnothing 450	3,800	200-277	50/60	325	1,310	73	60	12.13
3G500	\varnothing 500	6,100	200-277	50/60	690	1,250	97	60	19.1
3G560	\varnothing 560	7,080	200-480	50/60	970	1,160	77	60	19.6
3G630	\varnothing 630	12,000	200-480	50/60	830	1,010	82	60	20
3G650	\varnothing 650	12,536	380-480	50/60	2,270	1,080	82	60	55.13
3G710	\varnothing 710	14,008	380-480	50/60	2,750	1,230	79	60	57.33
3G800	\varnothing 800	14,773	380-480	50/60	2,220	1,030	77	60	57.33
3G910	\varnothing 910	17,480	380/480	50/60	2,800	980	76	60	63.95
3G990	\varnothing 990	18,305	380-480	50/60	2,000	650	75	60	66.15

Contact Engineering for specific part numbers and values

Please reference page 18-19 for accessories

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Inlet Ring Nozzles



Extensive range of accessories, e.g. guard grilles, inlet rings, switch power supplies, external electronics, capacitors. Please contact Engineering for assistance.

Part Number	Inlet Part Number	Guard Grille
R3G133	09566-2-4013	
R3G175	09566-2-4013	
R3G190	09566-2-4013	
R3G220	09609-2-4013	
R3G250	96359-2-4013	
R3G280	96360-2-4013	
R3G310	97512-2-4013	78130-2-4039
R3G355	35561-2-4013	
R3G400	54476-2-4013	78132-2-4039
R3G450	54478-2-4013	78136-2-4039
R3G500	63072-2-4013	78139-2-4039
R3G560	63071-2-4013	78137-2-4039
R3G630	63070-2-4013	78138-2-4039

EC Accessories

interface converter RS232-RS485



Reliable and proven communication when used with the ebm-papst Inc. LISA software and EC products. This interface converter permits bi-directional connection of RS232 devices (Laptop or PC) with ebmBUS devices (electronic commutation unit with RS485 interface).

Parts included in delivery: interface converter, 115 VAC power supply, adaptor leads with 2 x 9-pole SUB-D sockets, adaptor leads with 9-pole SUB-D socket and screw terminal RS485. Unit is delivered assembled with the power supply attached and the cables installed and labeled.

Part Number: 21487-1-0174A

LISA software for EC-SYSTEMS



Suitable for EC motors and electronics with ebmBUS.

System requirements: Windows 2000 /XP (download at www.ecgiants.com/ecdownloads.asp)

Features:

- Individual control and monitoring of 7,905 fans
- Group-oriented arrangement of fans
- Broadcast command for one group or all fans
- Speed, temperature or pressure control
- Error message

Part Number: 25711-2-0199

fan control software for Pocket PCs / PDAs



System requirements: Pocket PC / PDA with Windows Mobile 5.0, RS232 interface, and serial communication cable.

Features:

- Managing up to 31 fans
- Setting pre-set values and indicating actual values
- Setting parameters for PID control
- Setting fan address
- Setting mode of operation (heating/cooling)
- Alarm diagnosis
- Language selection for user interface

Part Number: 21500-1-0174

knob potentiometer



A revolutionary concept in panel mounted potentiometers. This unique design consists of a knob driving and incorporating a cermet potentiometer. Only the mounting hardware and terminals are situated on the back side of the panel reducing to a minimum the required clearance.

Features:

- Compact
- Minimum clearance required
- Fully sealed and panel sealed
- Metallic or plastic knob options
- Cermet or conductive plastic

Part Number: 420-05-0640

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