Product Data Sheet | 4412 LP



The engineer's choice

ebmpapst

4412 LP

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6.1 General 9

1 General

Fan type	Fan	
Rotational direction looking at rotor	clockwise	
Airflow direction	Air outlet over struts	
Bearing system	Ball bearing	
Mounting position	any	

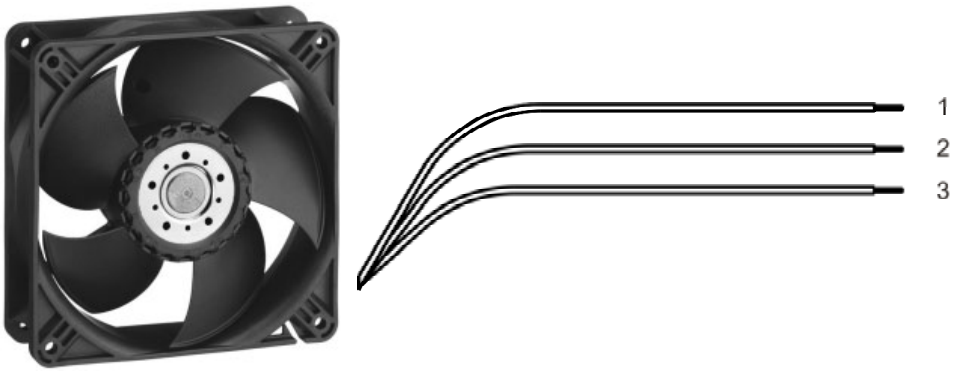
2 Mechanics

2.1 General

Width	119,0 mm	
Height	119,0 mm	
Depth	38,0 mm	
Weight	0,270 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges Screw size	wire outlet corner: 80 Ncm remaining corners: 80 Ncm ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

Electrical connection	Wires	
Length of lead wire Tolerance	L = 310 mm +- 10,0 mm	
Wire gauge (AWG)	24	
Insulation diameter	1,10 mm	
Contact	see drawing	



	Colour	Operation
Wire 1	red	+ UB
Wire 2	blue	- GND
Wire 3	violet	PWM

3 Operating Data

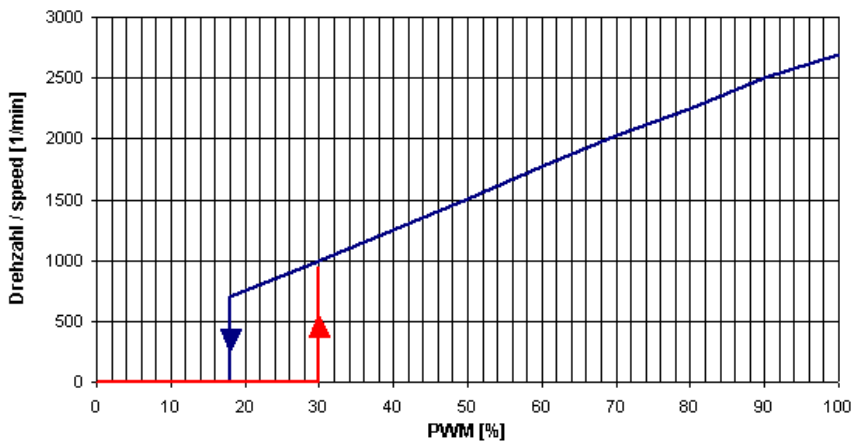
3.1 Operating Data - Electrical Interface - Input

Control input	PWM

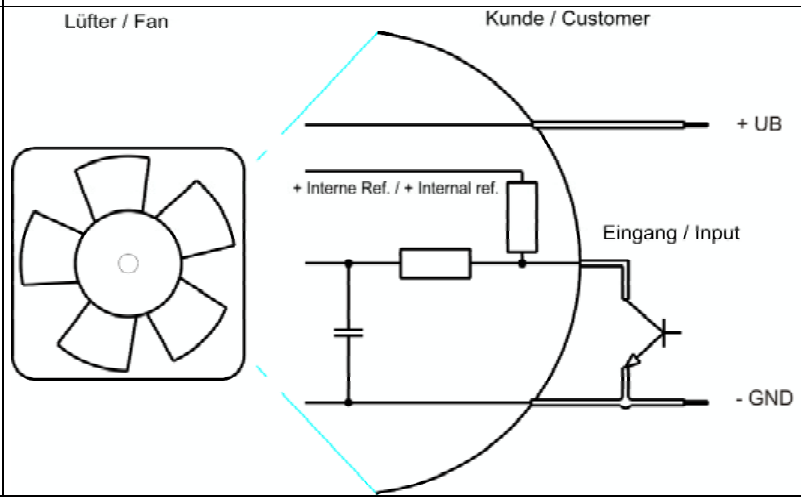
Features

Inpute type	Open collector / TTL	
PWM - Frequency		21 kHz - 28 kHz Typical: 25 kHz
Max. voltage for logic "Low"		0,8 V
Max. voltage for logic "High"	Open circuit voltage	5,25 V
Maximum source current	short circuit current	<= 5 mA
4 wire startup condition	PWM duty cycle	>= 30 %
4 wire operation condition after startup	PWM duty cycle	18 % - 100 %
Shutdown condition	PWM duty cycle	< 1 %
Typical time until warm restart	After shutdown by PWM	~ 6,2 s

Characteristics



Schematics



3.2 Electrical Operating Data

Measurement conditions:	Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C; Motor axis horizontal;warm-up time before measuring 5 minutes (unless otherwise specified).In the intake and outlet area should not be any solid obstruction within 0,5 m.

Δp = 0: corresp. to free air flow (see section 3.5)
I: corresp. to arithm. mean current value

Name	Condition		
PWM 0001	PWM: 100 %; f: 25 kHz		

Features	Condition	Symbol	Values		
Voltage range	Δp = 0	U	10,8 V		13,2 V
Nominal voltage	Δp = 0	U_N		12,0 V	
Power consumption Tolerance	Δp = 0 PWM 0001	P	2,0 W +- 17,5 %	2,5 W +- 12,5 %	3,1 W +- 15,0 %
Current consumption Tolerance	Δp = 0 PWM 0001	I	184 mA +- 17,5 %	207 mA +- 12,5 %	235 mA +- 15,0 %
Speed Tolerance	Δp = 0 PWM 0001	n	2.470 1/min +- 12,5 %	2.700 1/min +- 7,5 %	2.970 1/min +- 10,0 %
Starting current consumption				< 1.400 mA	

Name	Condition		
PWM 0002	PWM: 50 %; f: 25 kHz		

Features	Condition	Symbol	Values		
Voltage range	Δp = 0	U	10,8 V		13,2 V
Nominal voltage	Δp = 0	U_N		12,0 V	
Power consumption Tolerance	Δp = 0 PWM 0002	P	0,7 W +- 17,5 %	0,9 W +- 12,5 %	1,1 W +- 15,0 %
Current consumption Tolerance	Δp = 0 PWM 0002	I	68 mA +- 17,5 %	75 mA +- 12,5 %	84 mA +- 15,0 %
Speed Tolerance	Δp = 0 PWM 0002	n	1.300 1/min +- 12,5 %	1.470 1/min +- 7,5 %	1.640 1/min +- 10,0 %

3.3 Operating Data - Electrical Interface -Output

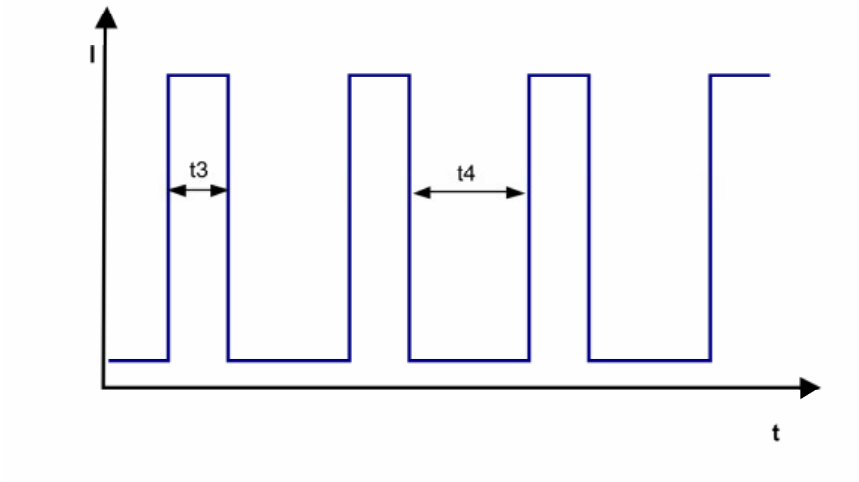
Tacho type	None

Alarm type	None

3.4 Electrical Features

Electronic function	None	

Reversed polarity protection Max. residual current at Un	Rectifying diode IF <= 10 mA	
Locked rotor protection	Auto restart	
Locked rotor current at Un	approx. 1.400 mA	
Clock signal t3/t4 at locked rotor	Typical: 0,16 s / 6,2 s	

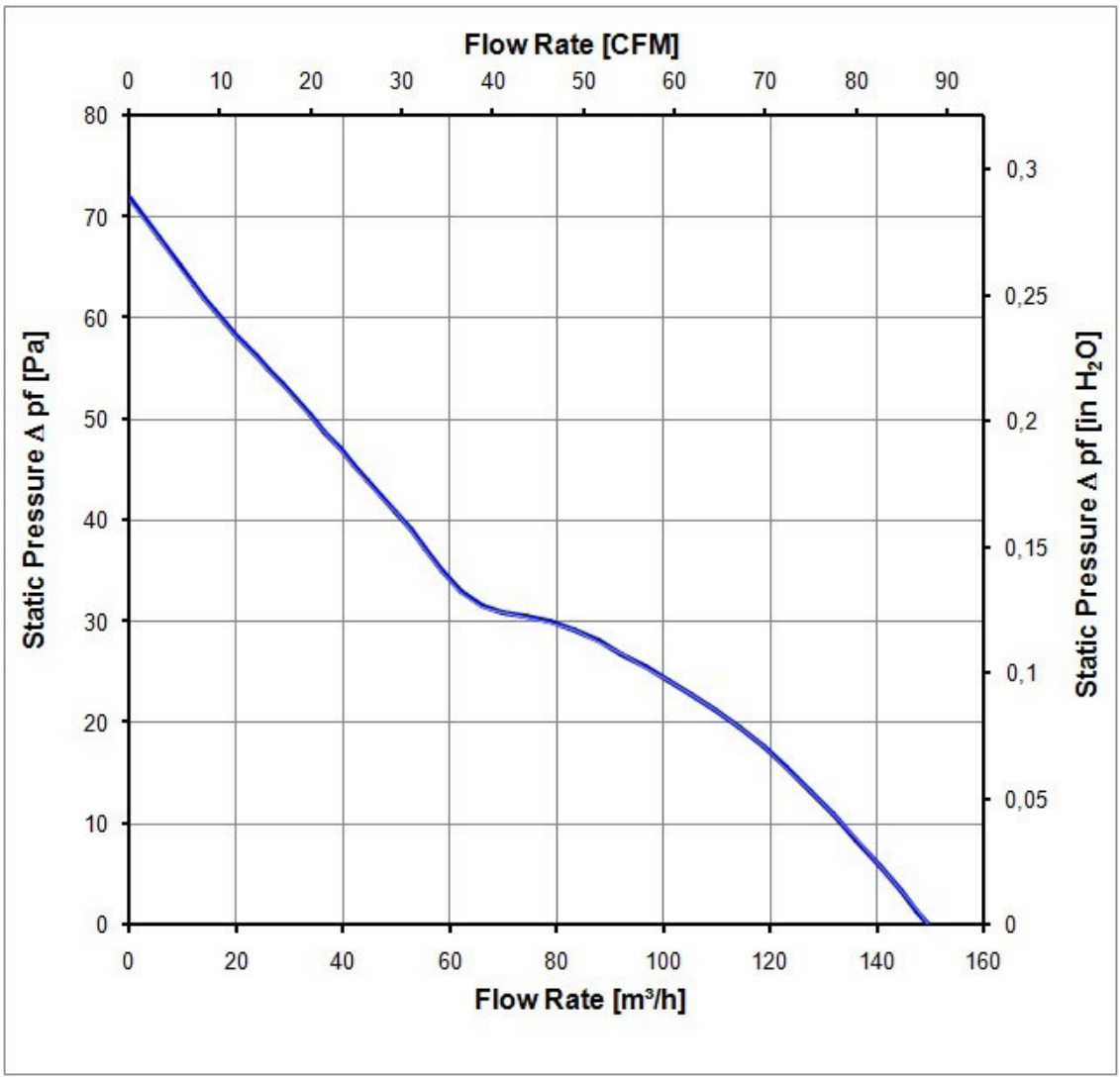


3.5 Aerodynamic

Measurement conditions:	Measured with a double chamber intake rig acc. to DIN EN ISO 5801. Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C; In the intake and outlet area should not be any solid obstruction within 0,5 m. The information is only valid under the specified test conditions and may be changed by the installation conditions. If there are deviations from the standard test conditions, the characteristic values must be checked under the installed conditions.

a.) Operation condition:

2.700 1/min at free air flow	PWM 100 %; f: 25 kHz		
Max. free-air flow (Δp = 0 / V̇ = max.)		150,0 m3/h	
Max. static pressure (Δp = max. / V̇ =0)		72 Pa	



3.6 Sound Data

Measurement conditions:	Sound pressure level: 1 Meter distance between microphone and the air intake. Sound power level: Acc. to DIN 45635 part 38 (ISO 10302) Measured in a semianchoic chamber with a background noise level of Lp(A) < 5 dB(A) For further measurement conditions see section 3.5

a.) Operation condition:

2.700 1/min at free air flow	PWM 100 %; f: 25 kHz	PWM min.:	PWM max.:

Optimal operating point	100,0 m3/h @ 23 Pa	
Sound power level at the optimal operating point	4,8 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	37,0 dB(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	70 °C	
Min. permitted storage temperature TL min.	-40 °C	
Max. permitted storage temperature TL max.	80 °C	

4.2 Climatic requirements*)

Humidity requirements	humid heat, constant; according to DIN EN 60068-2-78, 14 days	
Water exposure	None	
Dust requirements	None	
Salt fog requirements	None	

*) Permittet application area:
The product is intended for use in sheltered rooms with controlled temperature and controlled humidity. Directly exposure to water must be avoided.

Pollution degree 1 (according DIN EN 60664-1)
There is either no pollution or it occurs only dry, non-conductive pollution. The pollution has no negative impact.Please require severity levels and specification parameters from the responsible development departments

5 Safety

5.1 Electrical Safety

Dielectric strength DIN EN 60950 (VDE 0805) and DIN EN 60335 (VDE 0700) A.) Type test Measuring conditions: After 48h of storage at 95% R.H. and 25°C. No arcing or breakdown is allowed! All connections together to ground. B.) Routine test Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All connections together to ground.	500 VAC / 1 Min. 500 VAC / 1 Sec.	
Isolation resistance Measuring conditions: After 48h of storage at 95% R.H. and 25°C measured with U=500 VDC for 1 min.	RI > 10 MOhm	
clearance / creepage distance	1,0 mm / 1,2 mm	
Protection class	III	

5.2 Approval Tests

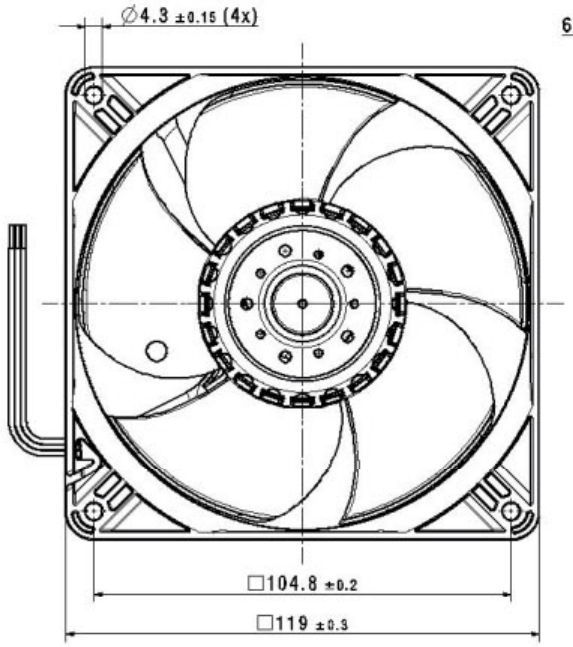
CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Canadian Standards Association	Yes / C22.2 No. 113 Fans and Ventilators
CCC	China Compulsory Certification	No

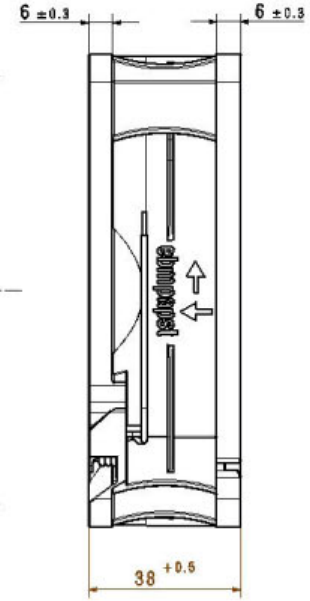
The approval tests are observed to:
U approval max.:14,0 V @ TU approval max.: 70,0 °C

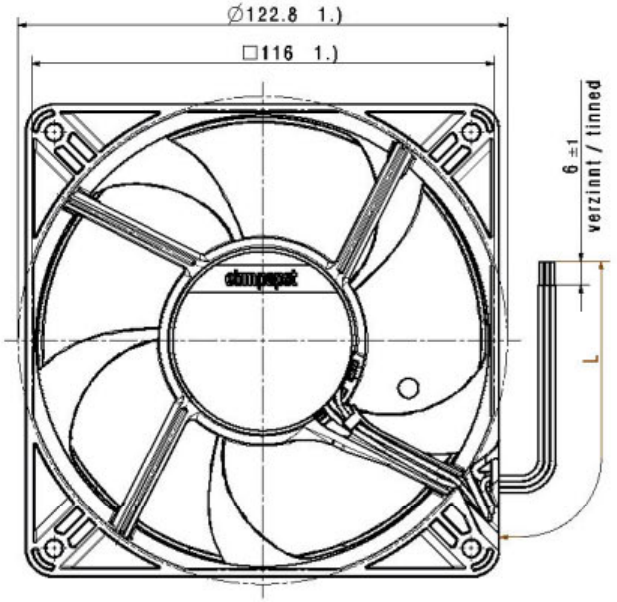
6 Reliability

6.1 General

Life expectancy L10 at TU = 40 °C	67.500 h	
Life expectancy L10 at TU max.	35.000 h	
Life expectancy L10 Delta (40 °C)	140.000 h	







Zeichnung entspricht 3D-Modell:
Drawing is equivalent to 3D-Model:
9293510500_CPA_000_A

1.) Maße fuer Montageausschnitt
(A) - max. Anziehdrehmoment = 0.8Nm
- Axialspiel: mit Feder spielfrei verspannt
- Anzahl und Länge der Litzen siehe BV- Bl. 1

1.) measures for mounting cut-out
(A) - max. tightening torque = 0.8Nm
- without axial clearance by a pre-loaded spring
- length and number of wires see design specification page 1

BV-Nummer/Note	Aend.-Nr./ Change-No.	Urspr.-System-Version/ Orig. System Version	Aenderung/ Modification	Werkstoff / Material:		Volumen / Volume (cm³):	
		Datum	Name			Gewicht / Mass (g/ea):	
		Bearb./ Drawn:					
		Gepr./ Checked:		Artikel / Title:			
Toleranzen / Tolerances:		Freig./ Release:					
Allgemeintoleranzen / Gen. Tolerances:		ebmpapst		Zchg.-Nr./ Drawing No:		Ers.f.Zchg. / Replaces:	
		ebm-papst St.Georgen GmbH & Co KG		Bauweise / Type of Product	Teilbild/count (Blatt/Page)	Index / Index	Format / Size: A3
							Massstab/Scale: 2:1