



The engineer's choice

**ebmpapst**

4414/12M

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**1 General**

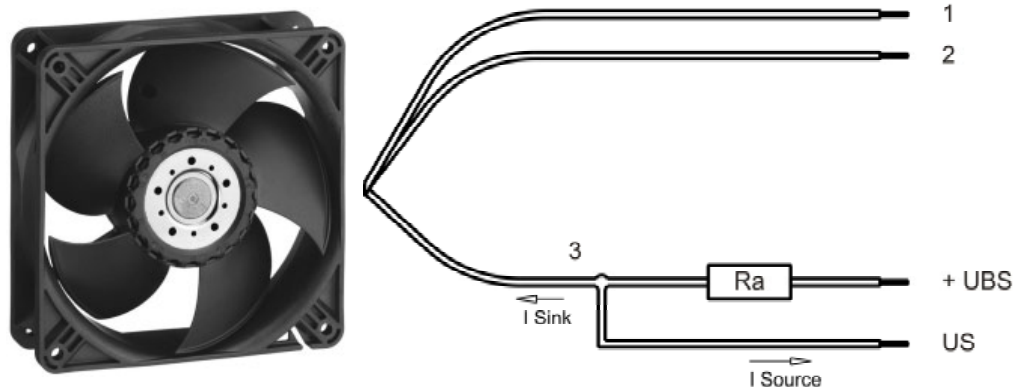
Fan type	Fan	
Rotational direction looking at rotor	clockwise	
Airflow direction	Air outlet over struts	
Bearing system	Ball bearing	
Mounting position	any	

**2 Mechanics****2.1 General**

Width	119,0 mm	
Height	119,0 mm	
Depth	38,0 mm	
Weight	0,275 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	wire outlet corner: 80 Ncm remaining corners: 80 Ncm	
Screw size	ISO 4762 - M4 degreased, without an additional brace and without washer	

**2.2 Connections**

Electrical connection	Wires	
Length of lead wire	L = 310 mm	
Tolerance	+/- 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	white	Tacho

The auxiliaries shown on the schematic diagram (which are required for the intended use) are not part of our delivery.

**3 Operating Data**

**3.1 Operating Data - Electrical Interface - Input**

Control input	None
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### 3.2 Electrical Operating Data

Measurement conditions: Normal air density = 1,2 kg/m<sup>3</sup>; 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.

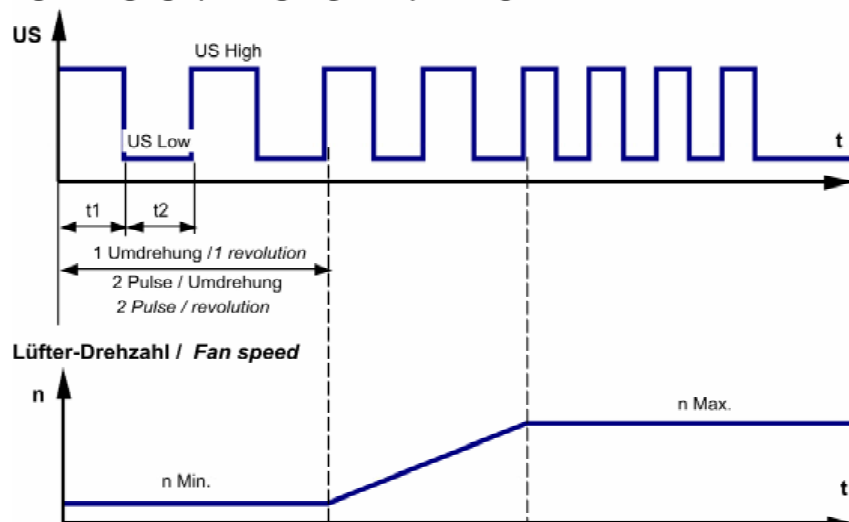
$\Delta p = 0$ : corresp. to free air flow (see section 3.5)  
 I: corresp. to arithm. mean current value

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	18,0 V		28,0 V
Nominal voltage	$\Delta p = 0$	$U_N$		24,0 V	
Power consumption	$\Delta p = 0$	P	2,1 W	4,1 W	5,9 W
Tolerance	0001		+/- 17,5 %	+/- 12,5 %	+/- 15,0 %
Current consumption	$\Delta p = 0$	I	118 mA	170 mA	210 mA
Tolerance	0001		+/- 17,5 %	+/- 12,5 %	+/- 15,0 %
Speed	$\Delta p = 0$	n	2.540 1/min	3.300 1/min	3.720 1/min
Tolerance	0001		+/- 12,5 %	+/- 7,5 %	+/- 10,0 %
Starting current consumption				< 1.400 mA	

### 3.3 Operating Data - Electrical Interface -Output

Tacho type	/12 (TTL)
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Signal-Ausgangsspannung / Signal output voltage

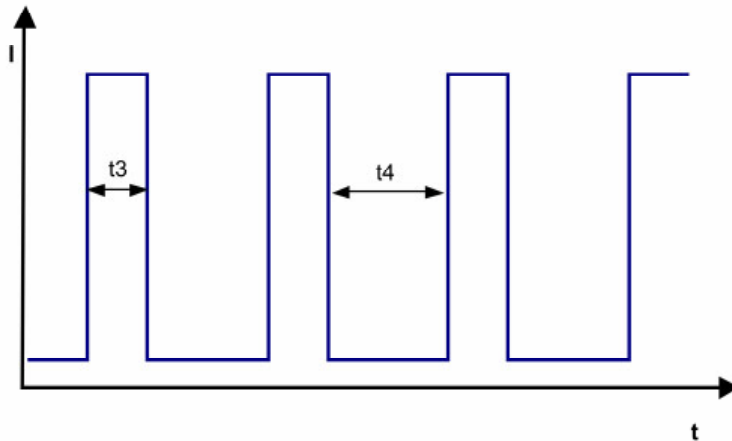


Features	Note	Values
Tacho signal TTL High		2,5 V      Min.: 5,5 V
Tacho signal Low	I sink: 1 mA	$\leq 0,4$ V
Tacho signal High	I source: 1 mA	
Maximum sink current		$\leq 1$ mA
Maximum source current		1 mA
External resistor	All voltages measured to GND.	
Tacho frequency	$(2 \times n) / 60$	
Tacho isolated from motor	No	
Slew rate		$\Rightarrow 0,5$ V/us

Alarm type	None
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### 3.4 Electrical Features

Electronic function	None	
Reversed polarity protection	Rectifying diode	
Max. residual current at $U_n$	$I_F \leq 50$ uA	
Locked rotor protection	Auto restart	
Locked rotor current at $U_n$	approx. 1.400 mA	
Clock signal $t_3/t_4$ at locked rotor	Typical: 0,5 s / 2,8 s	



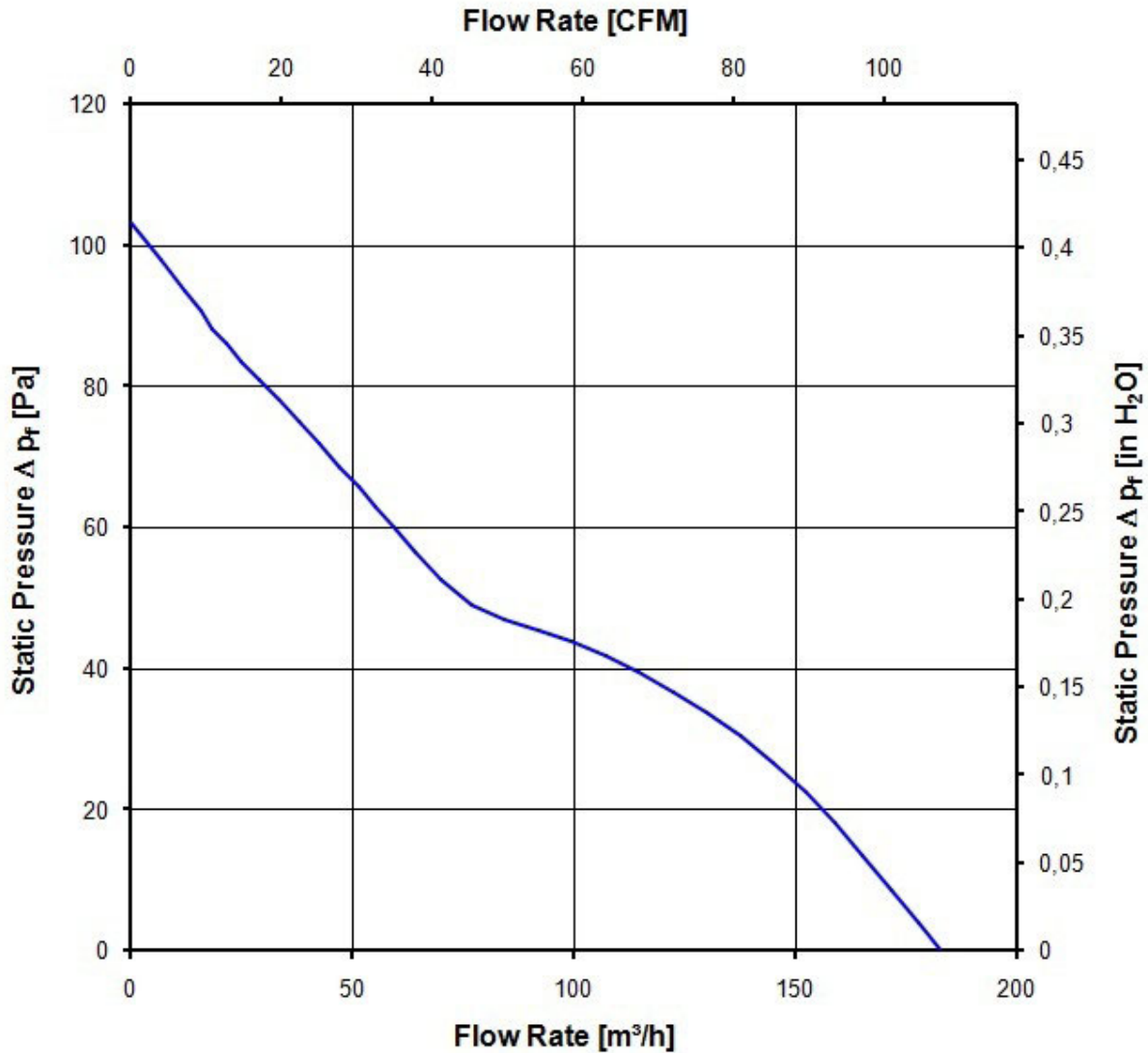
**3.5 Aerodynamic**

Measurement conditions: Measured with a double chamber intake rig acc. to DIN EN ISO 5801.  
 Normal air density = 1,2 kg/m<sup>3</sup>; Temperature 23°C +/- 3°C;  
 In the intake and outlet area should not be any solid obstruction within 0,5 m.

a.) Operation condition:

3.300 1/min at free air flow

Max. free-air flow ( $\Delta p = 0 / \dot{V} = \text{max.}$ )	184,0 m <sup>3</sup> /h	
Max. static pressure ( $\Delta p = \text{max.} / \dot{V} = 0$ )	103 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  $L_p(A) < 5 \text{ dB}(A)$   
 For further measurement conditions see section 3.5

a.) Operation condition:

3.300 1/min at free air flow
------------------------------

Optimal operating point	106,0 m <sup>3</sup> /h @ 38 Pa	
Sound power level at the optimal operating point	5,3 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	43,0 dB(A)	

## 4 Environment

### 4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	80 °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	
Radiation exposure	None	
Dust requirements	None	
Salt fog requirements	None	
Harmful gas requirements	None	

\*) Permitted 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.	500 VAC / 1 Min.	
B.) Routine test Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All connections together to ground.	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	Yes
UL	Yes / UL audited by CSA according to UL507, Electric Fans
VDE	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Yes / C22.2 No. 113 Fans and Ventilators
CCC	No

The approval tests are observed to:

U approval max.:28,0 V @ TU approval max.: 70,0 °C

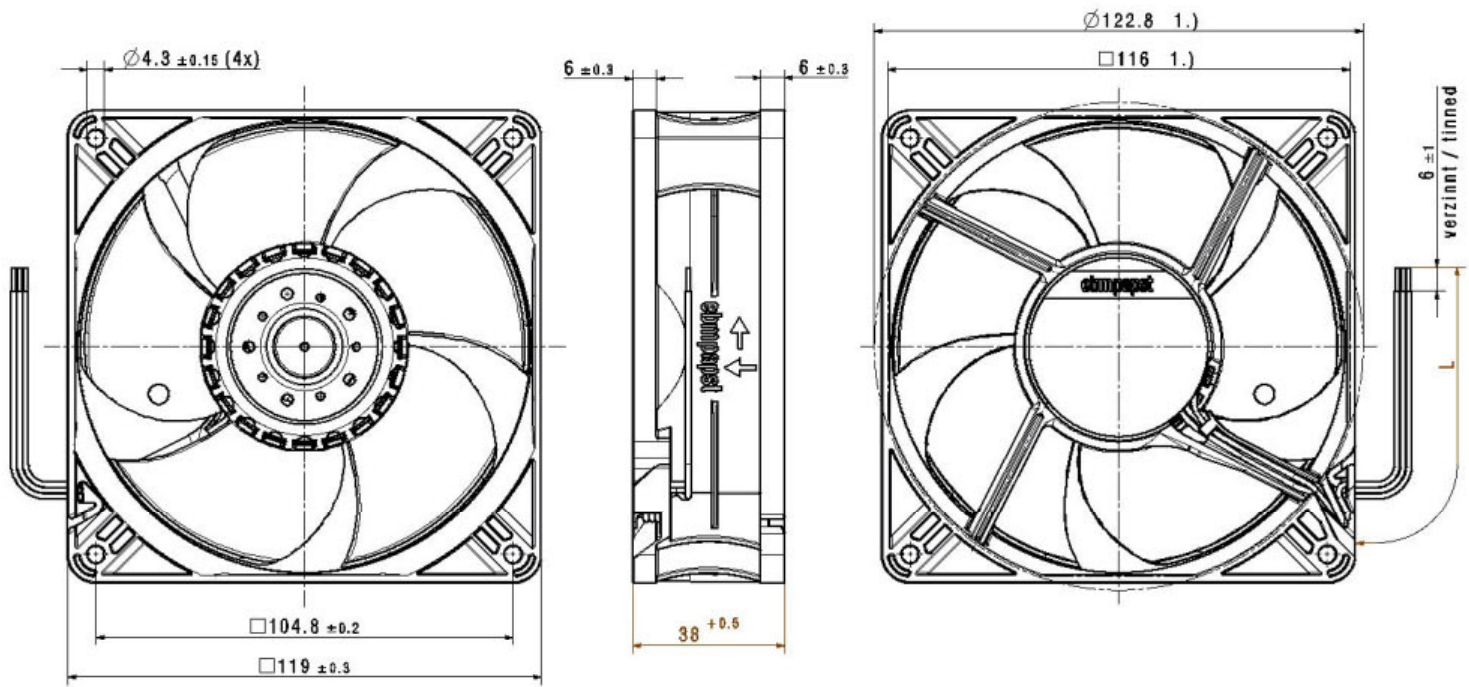
## 6 Reliability

### 6.1 General

Life expectancy L10 at TU = 40 °C	65.000 h	
Life expectancy L10 Delta (40 °C)	130.000 h	

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Zeichnung entspricht 3D-Modell:  
 Drawing is equivalent to 3D-Model:  
 9293510500\_CPA\_000\_A

- 1.) Maße fuer Montageausschnitt
- max. Anziehdrehmoment = 0.8Nm
  - Axialspiel: mit Feder spielfrei verspannt
  - Anzahl und Länge der Litzen siehe BV- Bl. 1
- 1.) measures for mounting cut-out
- max. tightening torque = 0.8Nm
  - without axial clearance by a pre-loaded spring
  - length and number of wires see design specification page 1

WZ-Nummer/Date 		Größe / Größe (mm) Größe / Größe (mm)		Material / Material: Material / Material	
Teilname / Teilname: Teilname / Teilname		Datum / Datum Datum / Datum		Artikel / Artikel: Artikel / Artikel	
Allgemeine Anmerkungen / Anmerkungen: Allgemeine Anmerkungen / Anmerkungen		Zeichn.-Nr. / Drawing No.: Zeichn.-Nr. / Drawing No.		Rev.-Zyklus / Revision: Rev.-Zyklus / Revision	
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