

Product Data Sheet #4312/2MI-208

ebmpapst

Die Wahl der Ingenieure



#4312/2MI-208

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1 General

Fan type	Axial fan	
Rotating direction looking at rotor	Clockwise	
Airflow direction	Air outlet over struts	
Bearing system	Ball bearing	
Mounting position	Any	

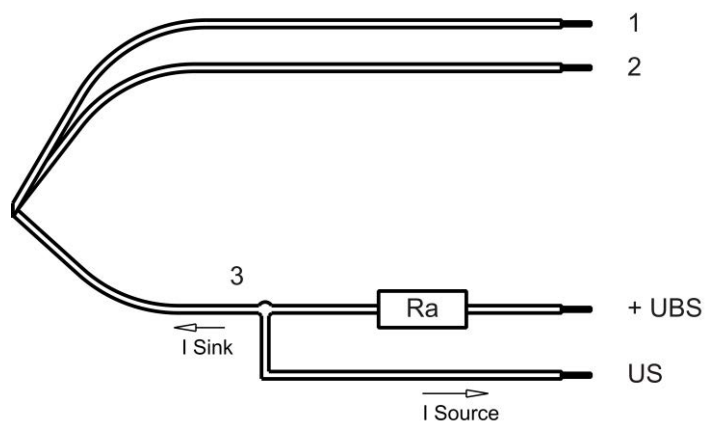
2 Mechanics

2.1 General

Width	119,0 mm	
Height	119,0 mm	
Depth	32,0 mm	
Mass	0,200 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	wire outlet corner: 20 Ncm remaining corners: 20 Ncm	
Screw size	ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

Electrical connection	Wires - Plug	
Lead wire length	L = 843 mm	
Tolerance	+/- 10,0 mm	
Wire size (AWG)	26	
Insulation diameter	1,35 mm	
Contact	See drawing	



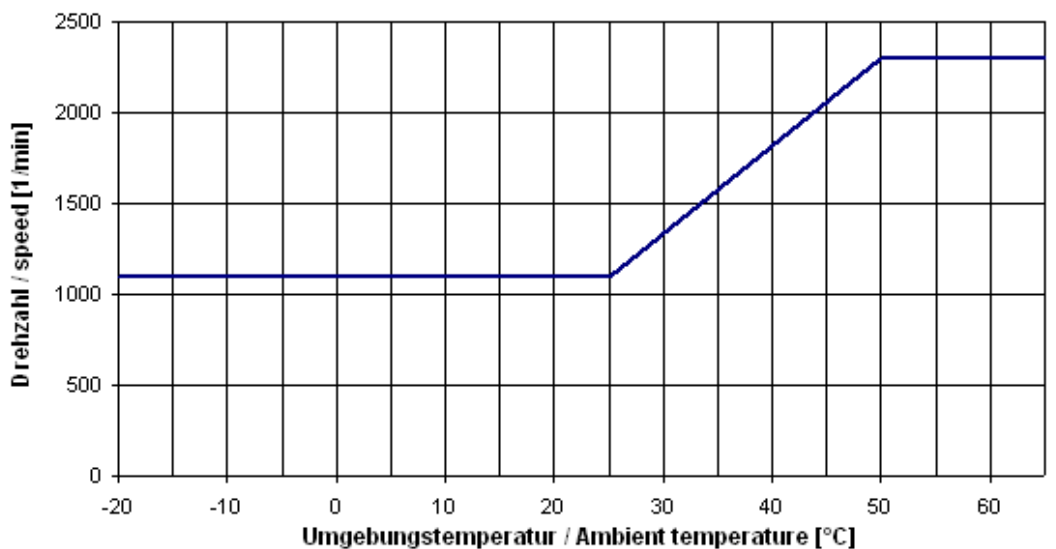
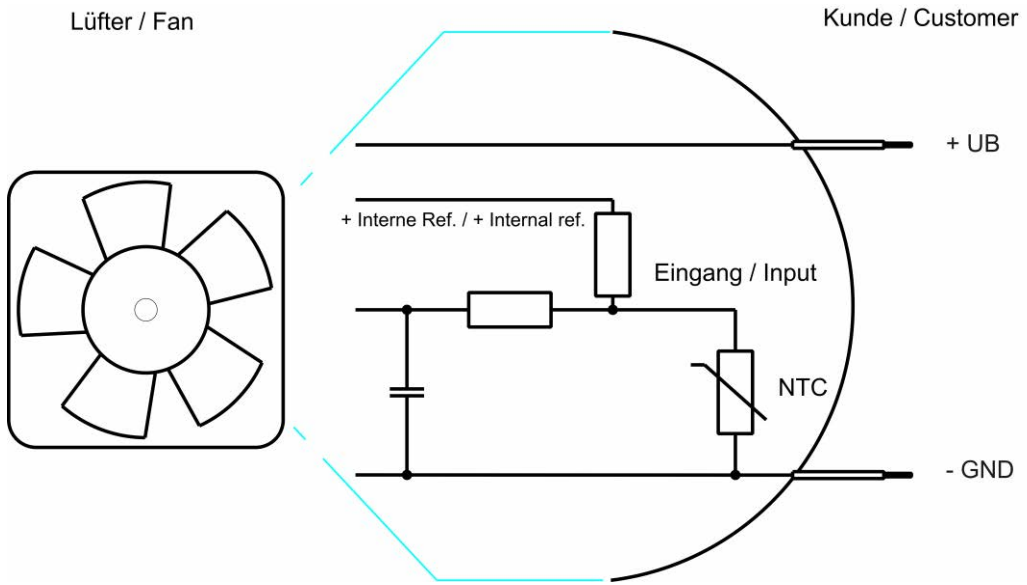
	Colour	Operation	plug connection
Wire 1	red	+ UB	Pin 2
Wire 2	blue	- GND	Pin 1
Wire 3	white	Tacho	Pin 3

3 Operating Data

3.1 Operating Data - Electrical Interface - Input

Control input	Internal Temperature Sensor
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Features

Characteristics	 <table border="1"> <caption>Graph Data: Fan Speed vs. Ambient Temperature</caption> <thead> <tr> <th>Umgebungstemperatur / Ambient temperature [°C]</th> <th>Drehzahl / speed [1/min]</th> </tr> </thead> <tbody> <tr><td>-20</td><td>1100</td></tr> <tr><td>-10</td><td>1100</td></tr> <tr><td>0</td><td>1100</td></tr> <tr><td>10</td><td>1100</td></tr> <tr><td>20</td><td>1100</td></tr> <tr><td>25</td><td>1100</td></tr> <tr><td>30</td><td>1300</td></tr> <tr><td>40</td><td>1800</td></tr> <tr><td>50</td><td>2300</td></tr> <tr><td>60</td><td>2300</td></tr> </tbody> </table>	Umgebungstemperatur / Ambient temperature [°C]	Drehzahl / speed [1/min]	-20	1100	-10	1100	0	1100	10	1100	20	1100	25	1100	30	1300	40	1800	50	2300	60	2300
Umgebungstemperatur / Ambient temperature [°C]	Drehzahl / speed [1/min]																						
-20	1100																						
-10	1100																						
0	1100																						
10	1100																						
20	1100																						
25	1100																						
30	1300																						
40	1800																						
50	2300																						
60	2300																						
Schematics	 Lüfter / Fan Kunde / Customer + UB + Interne Ref. / + Internal ref. Eingang / Input NTC - GND																						

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.

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

Name	Condition		
TU 0001	TU: $\geq 50^\circ\text{C}$		
NTC 0001			

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	8,0 V		15,0 V
Nominal voltage	$\Delta p = 0$	U_N		12,0 V	
Power consumption	$\Delta p = 0$	P	1,3 W +/- 25,0 %	3,3 W +/- 25,0 %	5,6 W +/- 25,0 %
Tolerance	TU / NTC 0001				
Current consumption	$\Delta p = 0$	I	160 mA +/- 25,0 %	275 mA +/- 25,0 %	370 mA +/- 25,0 %
Tolerance	TU / NTC 0001				
Speed	$\Delta p = 0$	n	1.500 1/min +/- 15,0 %	2.300 1/min +/- 15,0 %	2.800 1/min +/- 15,0 %
Tolerance	TU / NTC 0001				
Starting current consumption				1.200 mA	

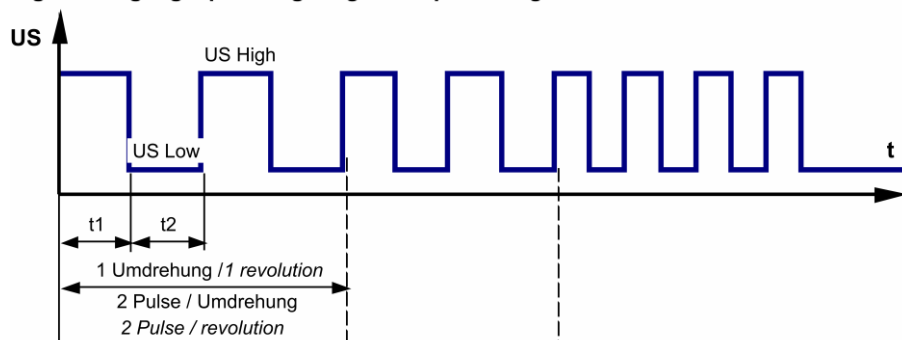
Name	Condition		
TU 0001	TU: $\leq 25^\circ\text{C}$		
NTC 0001			

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	8,0 V		15,0 V
Nominal voltage	$\Delta p = 0$	U_N		12,0 V	
Power consumption	$\Delta p = 0$	P	1,3 W +/- 25,0 %	1,1 W +/- 25,0 %	1,4 W +/- 25,0 %
Tolerance	TU / NTC 0001				
Current consumption	$\Delta p = 0$	I	80 mA +/- 25,0 %	90 mA +/- 25,0 %	95 mA +/- 25,0 %
Tolerance	TU / NTC 0002				
Speed	$\Delta p = 0$	n	1.100 1/min +/- 15,0 %	1.100 1/min +/- 15,0 %	1.100 1/min +/- 15,0 %
Tolerance	TU / NTC 0002				

3.3 Operating Data - Electrical Interface - Output

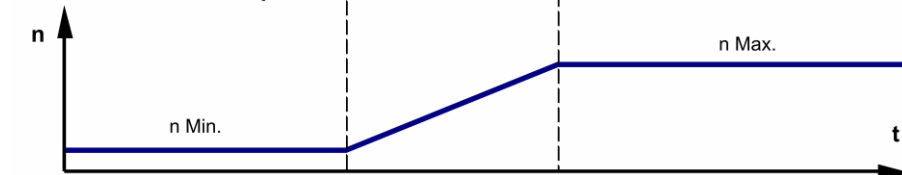
Tacho type	/2 (open collector)
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Signal-Ausgangsspannung / Signal output voltage



$$R_a = \frac{U_{BS} - U_{S \text{ Low}}}{I_{\text{Sink}}}$$

Lüfter-Drehzahl / Fan speed

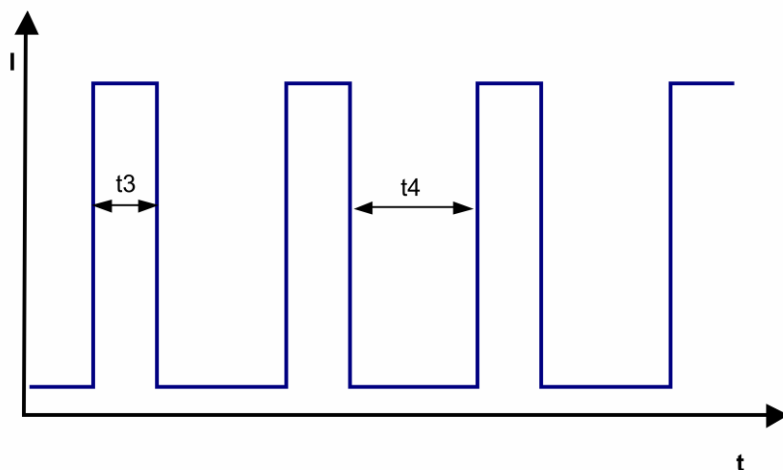


Features	Note	Values
Tacho operating voltage (UBS)		<= 60 V
Tacho signal Low	I sink: 2 mA	<= 0,4 V
Tacho signal High	I source: 0 mA	<= 60 V
Maximum sink current		4 mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency	(2 x n) / 60	77 Hz
Tacho isolated from motor	No	
Slew rate		=> 0,5 V/us

Alarm type	None
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3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at U_n	Rectifying diode $I_F \leq 10 \text{ mA}$	
Locked rotor protection	Auto restart	
Locked rotor current at U_n	approx. 1.200 mA	
Clock signal t_3/t_4 at locked rotor	Typical: 1,0 s / 10 s	



3.5 Aerodynamics

Measurement conditions:

Measured with a double chamber intake rig acc. to DIN EN ISO 5801.

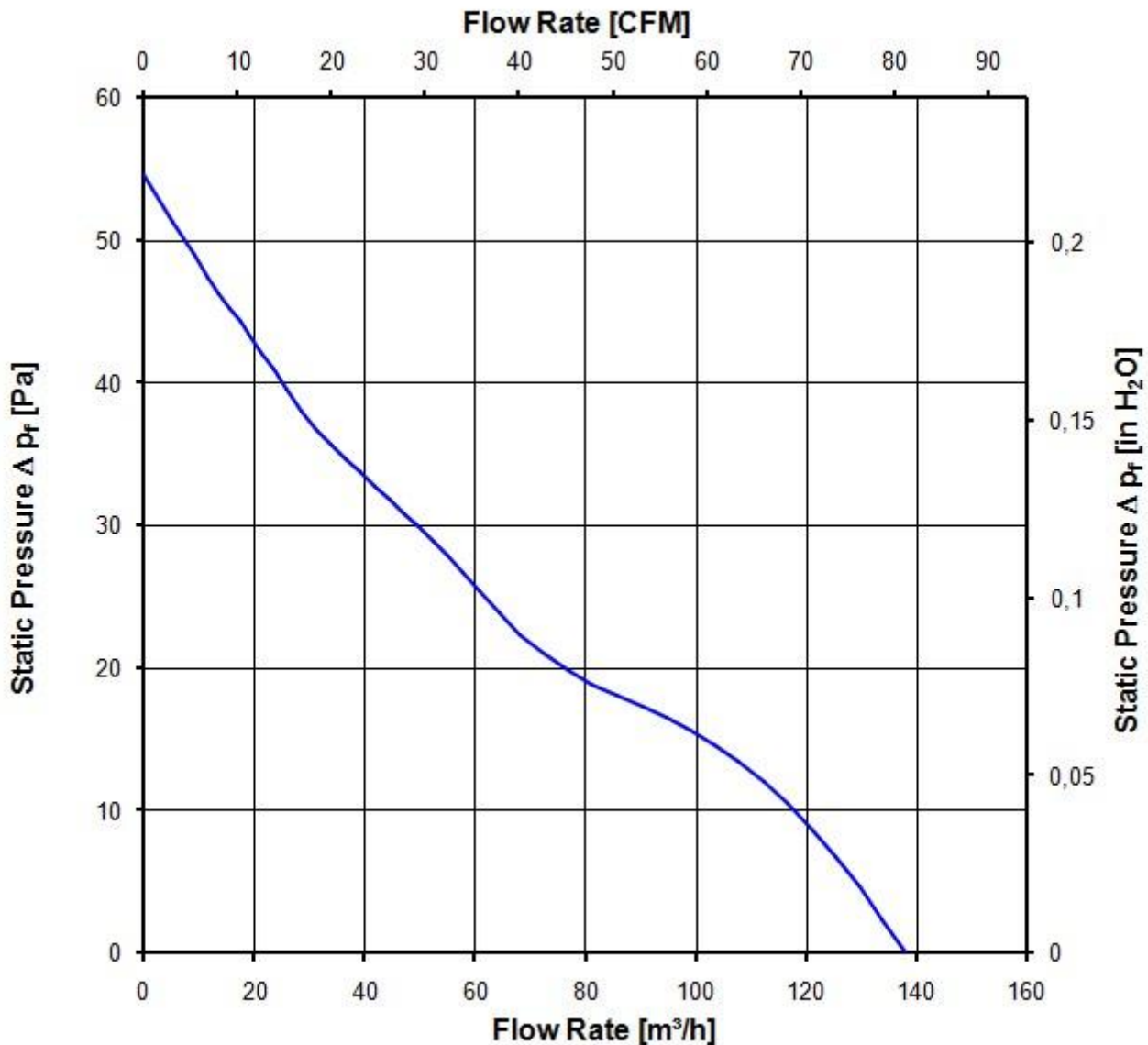
Normal air density = 1,2 kg/m³; Temperature 23°C +/- 3°C;

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:

2.300 1/min at free air flow			
Max. free-air flow ($\Delta p = 0 / \dot{V} = \text{max.}$)	138,0 m ³ /h		
Max. static pressure ($\Delta p = \text{max.} / \dot{V} = 0$)	54 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:

2.300 1/min at free air flow	TU $\geq 50 \text{ }^{\circ}\text{C}$		
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Optimal operating point	118,0 m ³ /h @ 9 Pa	
Sound power level at the optimal operating point	5,3 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	39,0 dB(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 $^{\circ}\text{C}$	
Max. permitted ambient temperature TU max.	65 $^{\circ}\text{C}$	
Min. permitted storage temperature TL min.	-40 $^{\circ}\text{C}$	
Max. permitted storage temperature TL max.	80 $^{\circ}\text{C}$	

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	

*) 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.

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	Yes / GB 12350 Safety Requirements for small Power Motors

6 Reliability

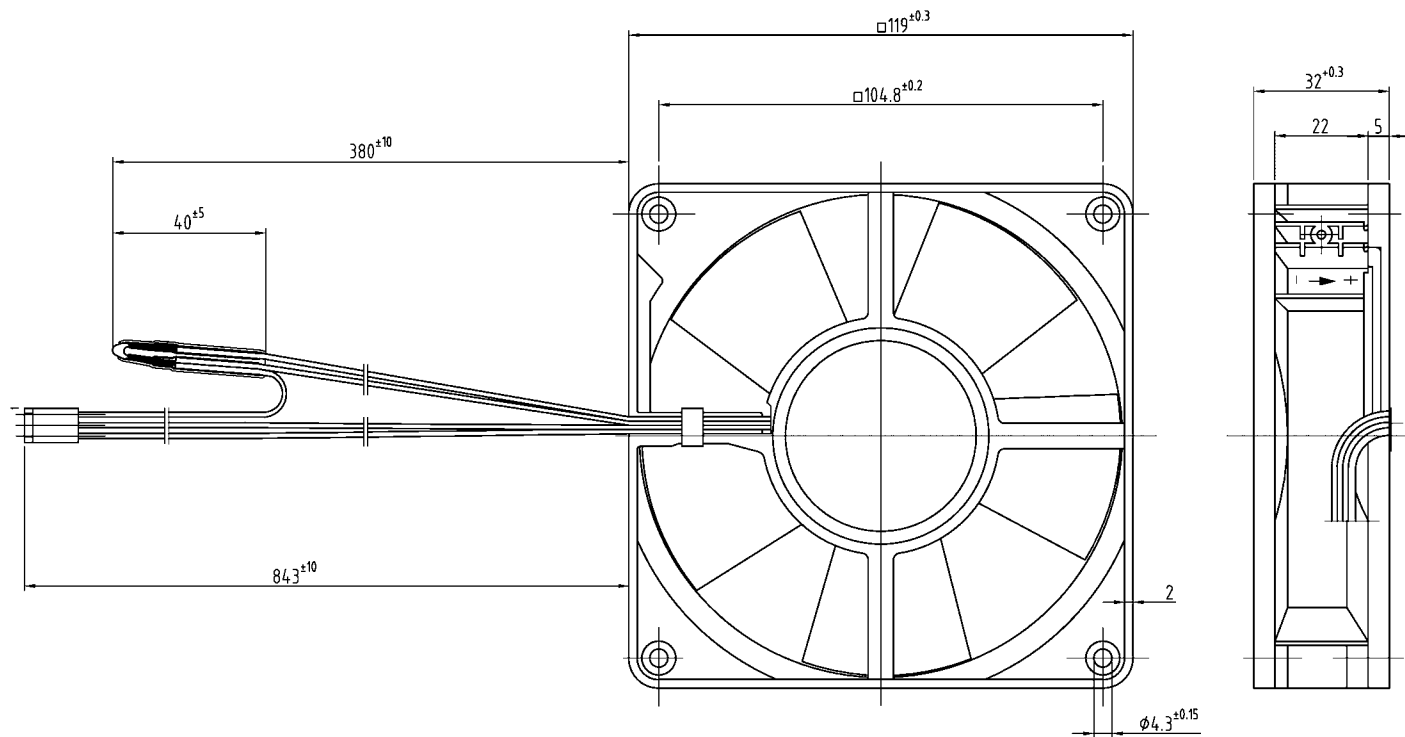
6.1 General

Life expectancy L10 at TU = 40 °C	70.000 h	
Life expectancy L10 at TU max.	40.000 h	
Life expectancy L10 IPC (40 °C)	117.500 h	

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Schutzvermerk nach DIN ISO 1916, second/second
Refer to protection notice DIN ISO 1916

Steckergehäuse /
plug housing:
22-01-2035 Fa. Molex
Kontakt / contact:
08-50-0113 Fa. Molex
Steckerbelegung /
plug connection:
Pin 1 = blau/ blue (GND)
Pin 2 = rot/ red (+5V)
Pin 3 = weiß/ white (Tacho)
= violett/ violett (NTC)



-Axialspiel bei Kugellagerung (K): 0 (durch Federausgleich) -axial clearance by ball bearing (K): 0 (by a pre-loaded spring)
-Axialspiel bei Gleitlagerung (G): 0.1 - 0.6 -axial clearance by sleeve bearing (G): 0.1 - 0.6

SAP-Status/State	Änd.-Nr./Change-No.	Auftrags-/System-Version Datum/Date	ebmpapst CAD-Umgebung/ CAD-Environment Name/Name	Werkstoff/Material:	Volumen/Volume (mm ³):
					Gewicht/Mass (g):
		Bearb./ Drawn		Artikel/Title	
Tolerierung/Tolerances:		Gepr./ Checked			
Allgemeintoleranzen/Gen. tolerances:		Freig./ Released			
			ebmpapst	Zchg.-Nr. / Drawing-No.:	Ers.f.Zchg. / Replaces:
			ebm-papst St. Georgen GmbH & Co. KG	Dokumenttyp/Type of Document	Teilnummer/Part No.
				Index/Index	Formel/Size
					Maßstab/Scale