1 General

Fan type	Fan	
Rotating direction looking at rotor	Counterclockwise	
Airflow direction	Air outlet over struts	
Bearing system	Ball bearing	
Mounting position - shaft	Any	

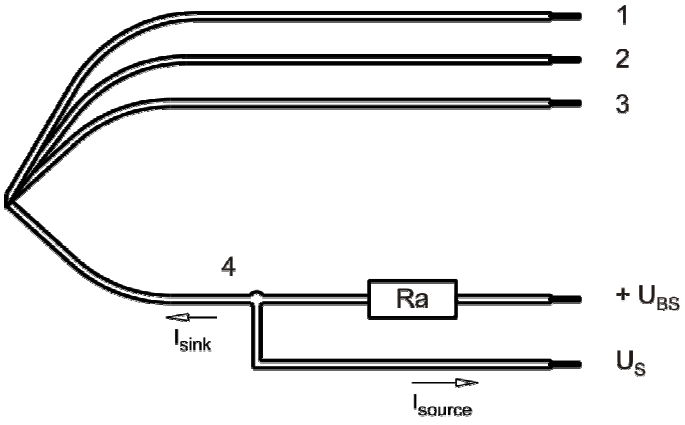
2 Mechanics

2.1 General

Width	119,0 mm	
Height	119,0 mm	
Depth	25,4 mm	
Mass	0,245 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges Screw size	Wire outlet corner: 110 Ncm Remaining corners: 110 Ncm ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

Electrical connection	Wires	
Lead wire length Tolerance	L = 310 mm +- 10 mm	



Wire	Color	Operation	Wire size	Insulation diameter
1	red	+ UB	AWG 22	1,70 mm
2	blue	- GND	AWG 22	1,70 mm
3	violet	PWM	AWG 22	1,70 mm
4	white	Tacho	AWG 22	1,70 mm

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

3 Operating Data

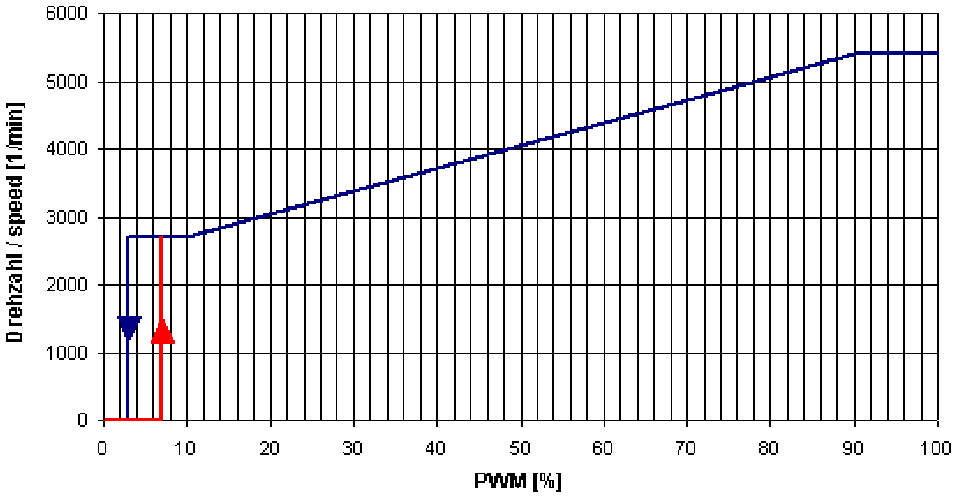
3.1 Electrical Interface - Input

Control input	PWM

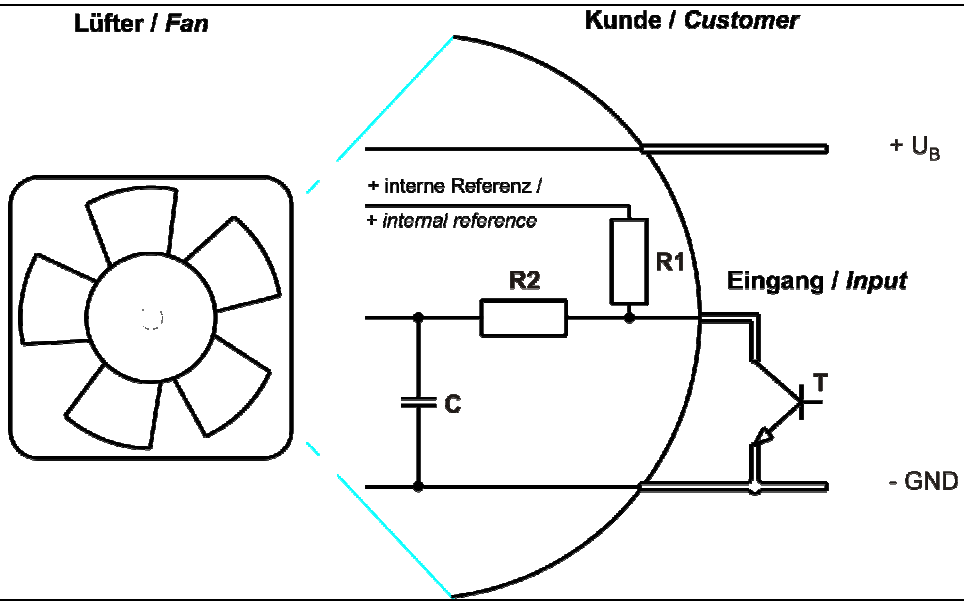
Features

Inpute type	Open collector	
PWM - Frequency		2 kHz - 5 kHz

Characteristics



Schematics



Speed control: 0... 100 % PWM; f: 2... 5 kHz; open collector

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 chapter aerodynamics)
I: corresp. to arithm. mean current value

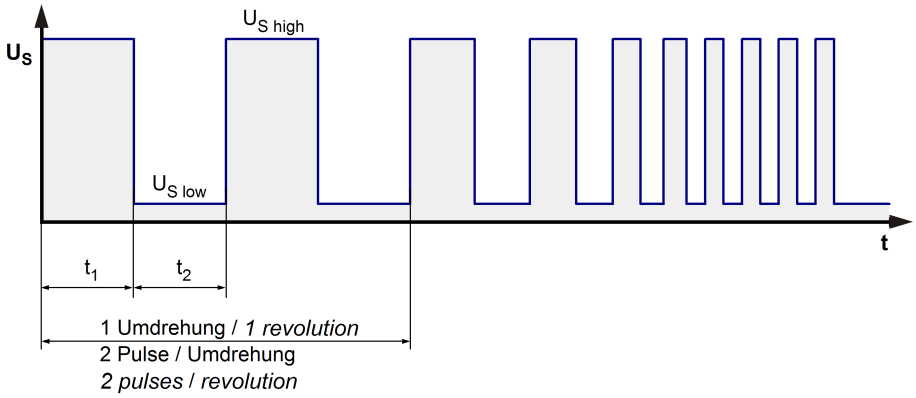
Name	Condition		
PWM 0001	PWM: 90 %;	f: 2 kHz	f: 5 kHz

Features	Condition	Symbol	Values		
Voltage range		U	9,0 V		13,2 V
Nominal voltage		U_N		12,0 V	
Power consumption Tolerance	Δp = 0 PWM 0010	P	6,6 W +- 17,5 %	12,0 W +- 25,0 %	13,7 W +- 25,0 %
Current consumption Tolerance	Δp = 0 PWM 0010	I	730 mA +- 17,5 %	1.000 mA +- 25,0 %	1.040 mA +- 25,0 %
Speed Tolerance	Δp = 0 PWM 0010	n	4.150 1/min +- 12,5 %	5.400 1/min +- 5,0 %	5.400 1/min +- 25,0 %
Starting current consumption				5.200 mA	

3.3 Electrical Interface - Output

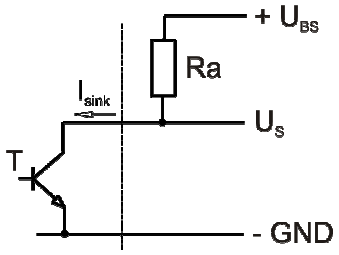
Tacho type	/2 (open collector)

Signal-Ausgangsspannung / *Signal output voltage*

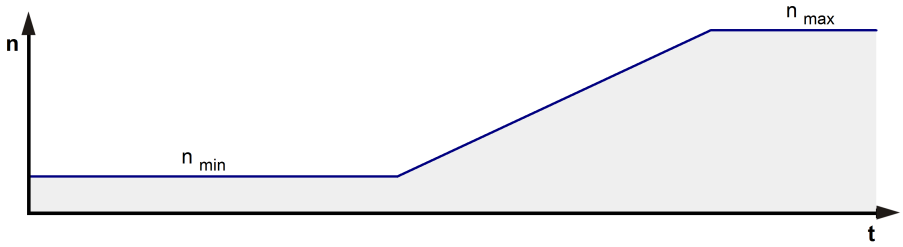


$$Ra = \frac{U_{BS} - U_{S\,low}}{I_{sink}}$$

Lüfter / *Fan* **Kunde / *Customer***



Lüfter-Drehzahl / *Fan speed*

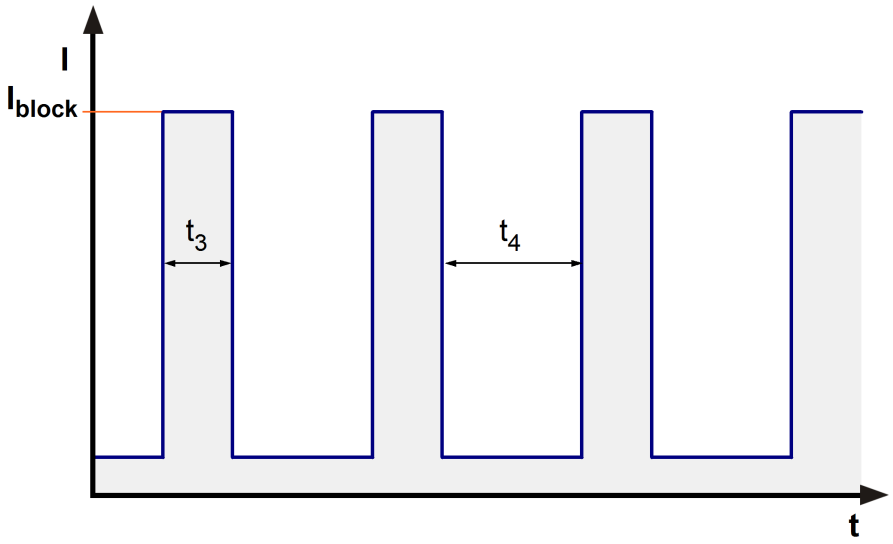


Features		**Note**	**Values**
Tacho operating voltage	U_{BS}		<= 30,0 V
Tacho signal Low	$U_{S\,low}$	I sink: 2 mA	<= 0,4 V
Tacho signal High	$U_{S\,high}$	I source: 0 mA	30,0 V
Maximum sink current	I_{sink}		<= 4 mA
External resistor		External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency		(2 x n) / 60	
Tacho isolated from motor		No	
Slew rate			=> 0,5 V/us

n = revolutions per minute (1/min)

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at U_N	Rectifying diode I_F <= 100 uA	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block}	
Clock signal at locked rotor	t_3 / t_4 typical: 0,4 s / 20,0 s	


I
I block
t3
t4
t

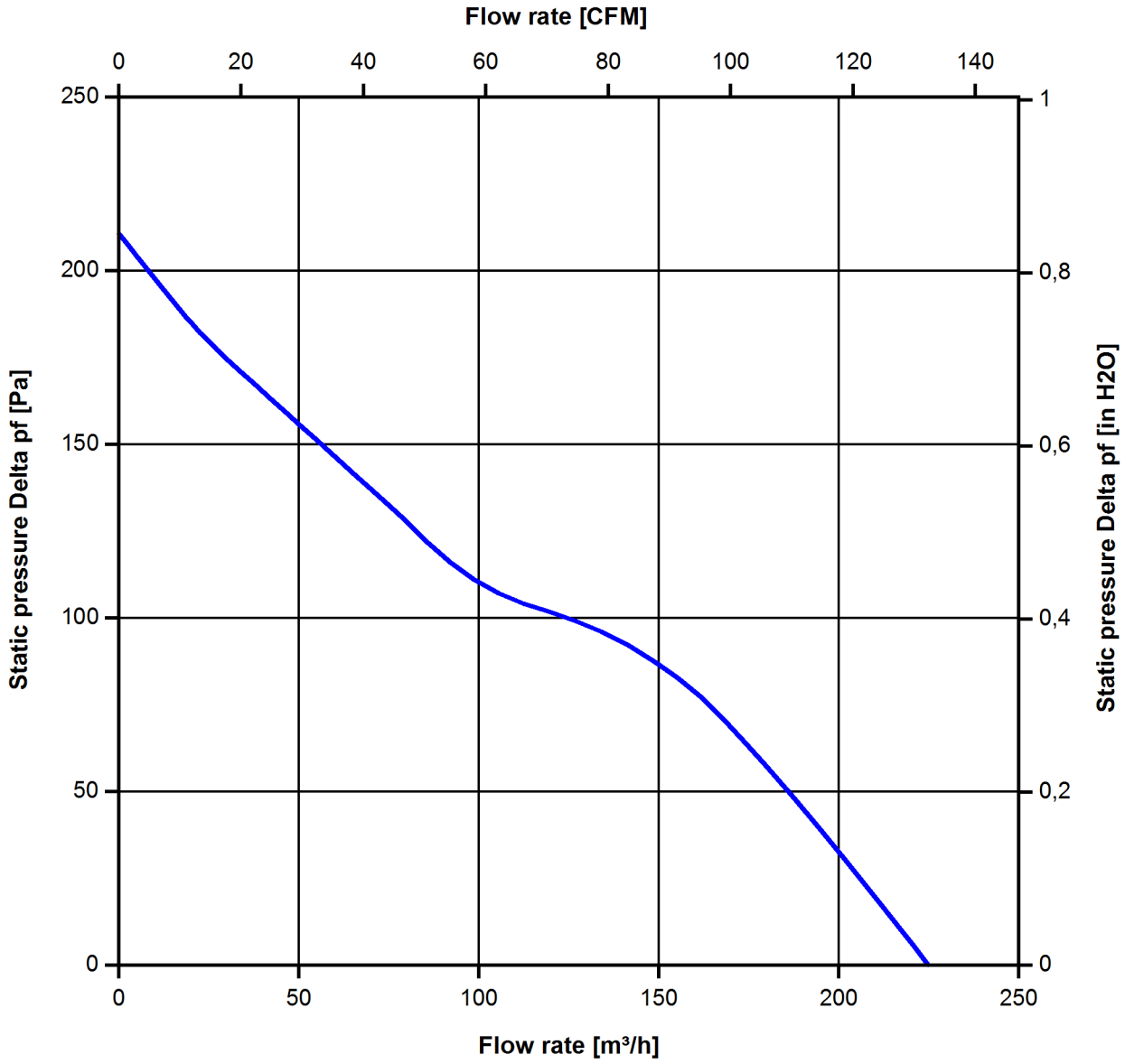
3.5 Aerodynamics

Measurement conditions:	Measured with a double chamber intake rig acc. to DIN EN ISO 5801. Normal air density = 1,2 kg/m3; Temperature 23℃ +/ - 3℃; In the intake and outlet area should not be any solid obstruction within 0,5 m. Motor shaft horizontal. 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:

5.400 1/min at free air flow	PWM 90 %;	f: 2 kHz	f: 5 kHz

Max. free-air flow (Δp = 0 / V̇ = max.)	225,0 m3/h	
Max. static pressure (Δp = max. / V̇ =0)	210 Pa	



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℃. 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. 850 VDC / 1 Sec.	
Isolation resistance Measuring conditions: After 48h of storage at 95% R.H. and 25℃ measured with U=500 VDC for 1 min.	RI > 10 MOhm	
Clearance / creepage distance	1,0 mm / 1,2 mm	
Protection class	III	

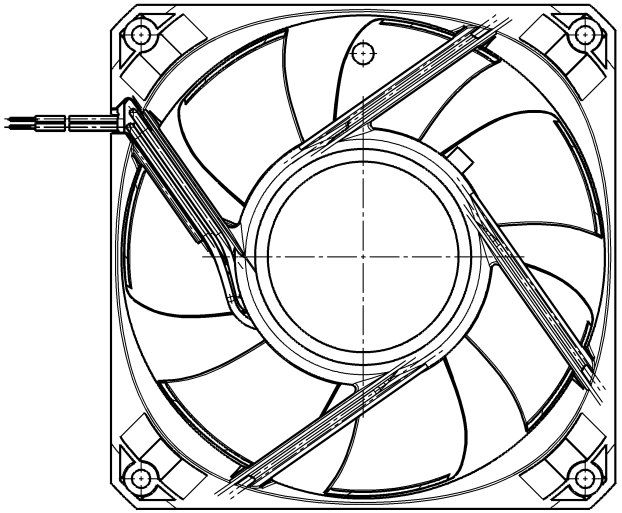
5.2 Approval Tests

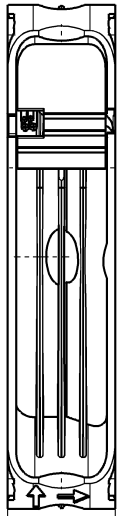
CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Canadian Standards Association	Yes / C22.2 No. 113 Fans and Ventilators
CCC	China Compulsory Certification	Not applicable

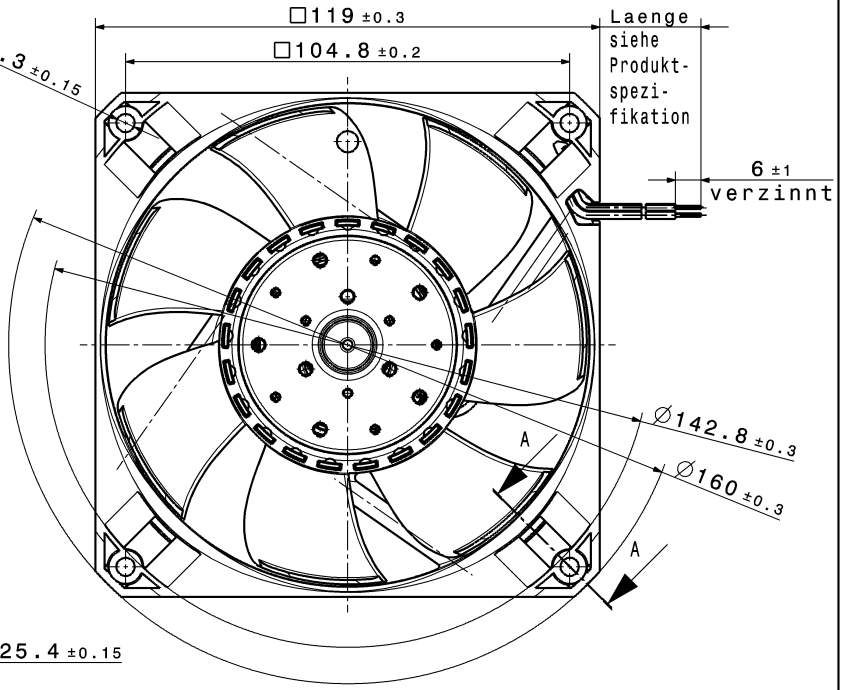
6 Reliability

6.1 General

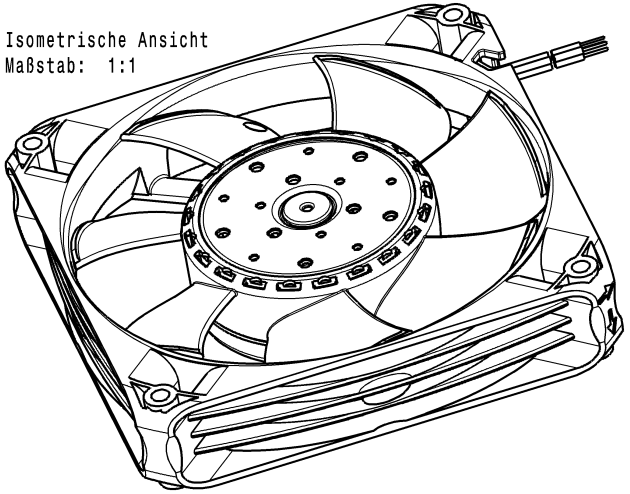
Life expectancy L10 at TU = 40 ℃	60.000 h	
Life expectancy L10 at TU max.	30.000 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 ℃	102. 500 h	



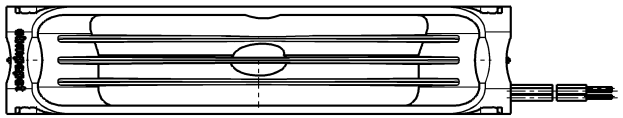


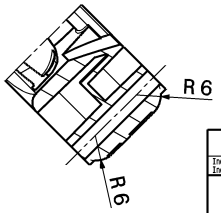


Isometrische Ansicht
Maßstab: 1:1



SchnittA-A
Maßstab: 1:1





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Gepr./ Checked	-----	-----
Freig./ Releas.	02.11.2005	Koletzki

Toleranzen / Tolerances:
DIN 7167

Allgemeintoleranzen / Gen. Tolerances:
DIN ISO 2768 mK-E

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ebm-papst St.Georgen GmbH & Co KG

Werkstoff/ Material: .....

Volumen/ Volume: ..... Gewicht/ Wass (kg): .....

Betriebsmittelbezeichnung / Name of Equipment:
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Artikel / Title:
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Zchg.-Nr./ Drawing No: **9694390181**

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