

## 1 General

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

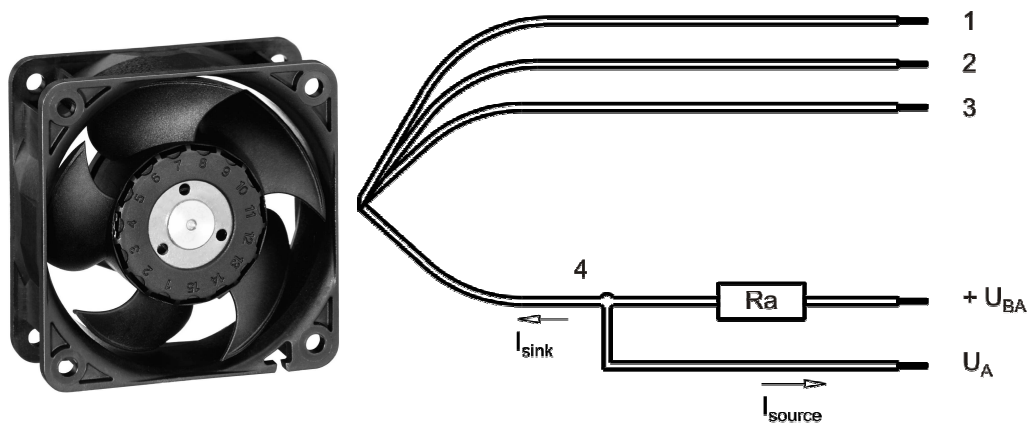
## 2 Mechanics

### 2.1 General

Width	60,0 mm	
Height	60,0 mm	
Depth	25,0 mm	
Mass	0,070 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	Wire outlet corner: 10 Ncm Remaining corners: 20 Ncm	
Screw size	ISO 4762 - M3 degreased, without an additional brace and without washer	

### 2.2 Connections

Electrical connection	Wires	
Lead wire length	L = 310 mm	
Tolerance	+ - 10,0 mm	



Wire	Color	Operation	Wire size	Insulation diameter
1	red	+ UB	AWG 24	1,50 mm
2	blue	- GND	AWG 24	1,50 mm
3	violet	PWM	AWG 24	1,50 mm
4	white	Alarm		

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

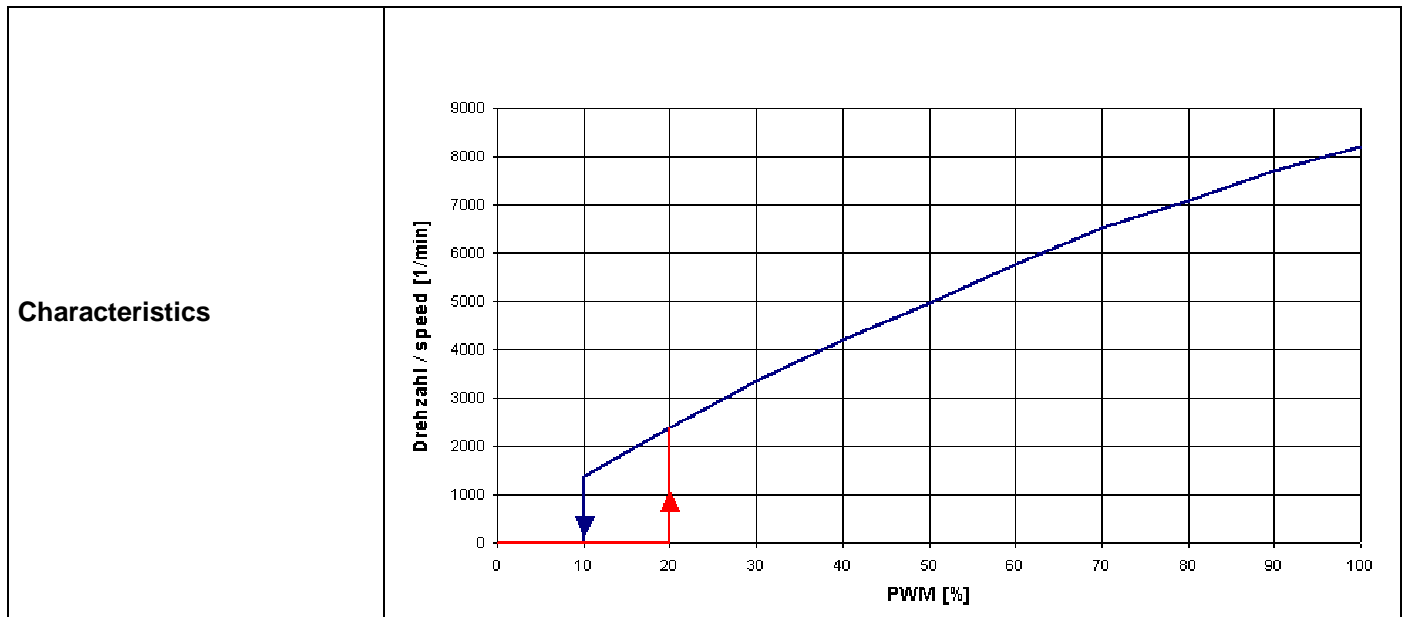
### 3 Operating Data

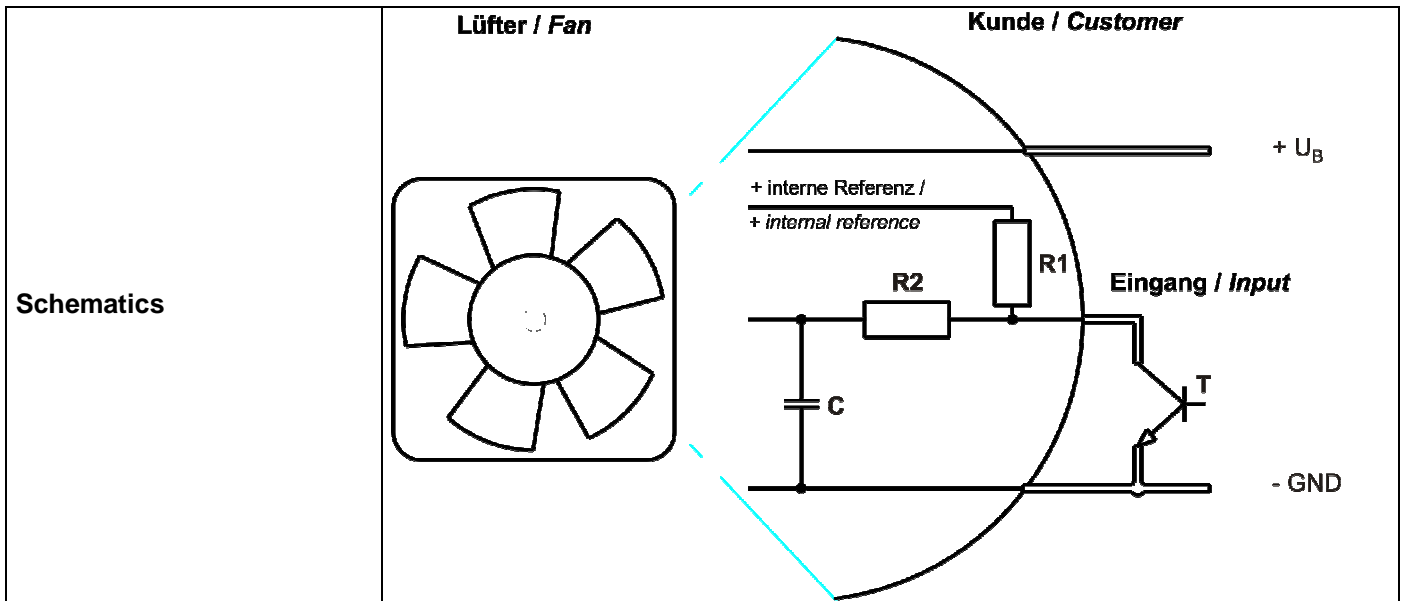
#### 3.1 Electrical Interface - Input

Control input	PWM
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#### Features

Input 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	$\leq 5$ mA
4 wire startup condition	PWM duty cycle	$\geq 20$ %
4 wire operation condition after startup	PWM duty cycle	10 % - 100 %
Shutdown condition	PWM duty cycle	$< 1$ %
Typical time until warm restart	After shutdown by PWM	$\sim 2,8$ s





### 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.

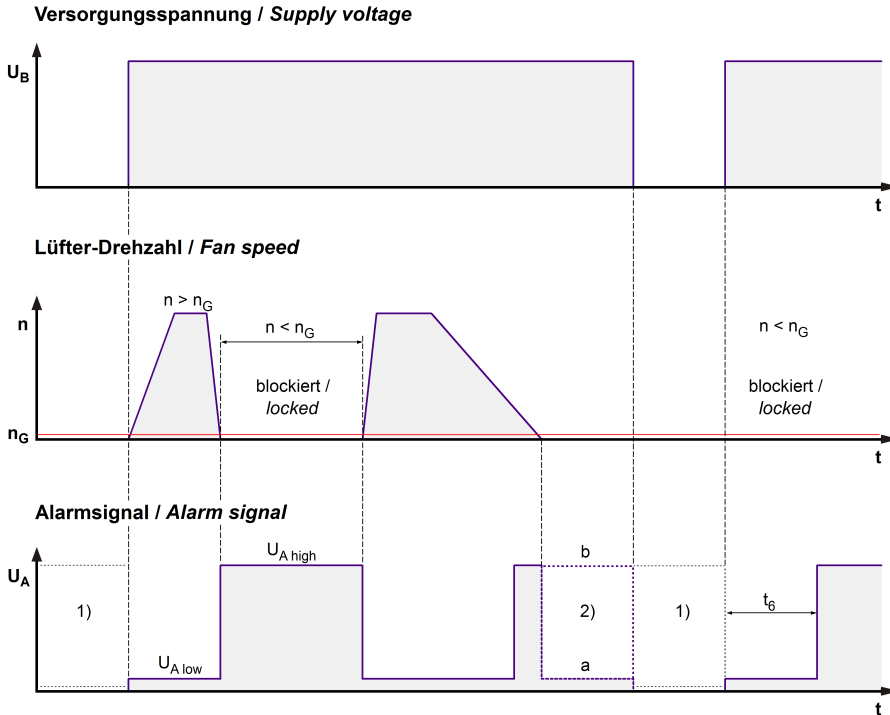
$\Delta p = 0$ : corresp. to free air flow (see chapter aerodynamics)  
 I: corresp. to arithm. mean current value

Name	Condition
PWM 0001	PWM: 100 %; f: 25 kHz   f: 21 kHz   f: 28 kHz

Features	Condition	Symbol	Values		
Voltage range		U	18 V		30 V
Nominal voltage		U <sub>N</sub>		24 V	
Power consumption	$\Delta p = 0$	P	2,1 W	3,7 W	5,9 W
Tolerance	PWM 0010		+/- 17,5 %	+/- 12,5 %	+/- 12,5 %
Current consumption	$\Delta p = 0$	I	117 mA	155 mA	195 mA
Tolerance	PWM 0010		+/- 17,5 %	+/- 12,5 %	+/- 12,5 %
Speed	$\Delta p = 0$	n	6.500 1/min	8.200 1/min	9.650 1/min
Tolerance	PWM 0010		+/- 12,5 %	+/- 7,5 %	+/- 10 %
Starting current consumption				722 mA	

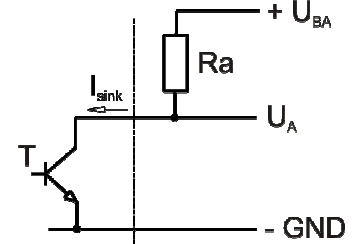
### 3.3 Electrical Interface - Output

Alarm type	/39 (low = ok, open collector)
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$$R_a = \frac{U_{BA} - U_{A\text{low}}}{I_{\text{sink}}}$$

Lüfter / Fan      Kunde / Customer

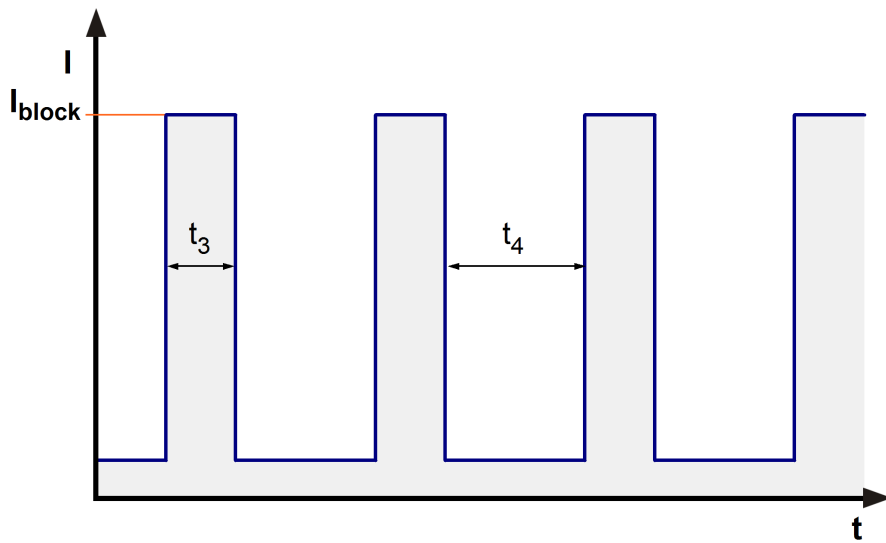


- 1) Wenn der Lüfter abgeschaltet ist, hängt der Zustand des Ausgangssignals  $U_A$  von der Kundenapplikation ab.  
 When the fan is powered off, the output signal  $U_A$  depends on the customer's application.
- 2) Für den gültigen Zustand (a oder b) siehe Alarmunterdrückung in der Tabelle.  
 For the valid condition (a or b) see alarm suppression in the table.

Features	Note	Values
Alarm operating voltage	$U_{BA}$	$\leq 30 \text{ V}$
Alarm signal Low	$U_{A\text{low}}$	$\leq 0,5 \text{ V}$
Alarm signal High	$U_{A\text{high}}$	$30 \text{ V}$
Maximum sink current	$I_{\text{sink}}$	$\leq 4 \text{ mA}$
External resistor	External resistor $R_a$ from $U_{BA}$ to $U_A$ required. All voltage measured to GND.	
Alarm trip speed limit	$n_G$	$0 \text{ 1/min}$
Alarm at sense failure	No	
Alarm latch	No	
Alarm isolated from motor	No	

### 3.4 Electrical Features

Electronic function	None	
Reversed polarity protection	Rectifying diode	
Max. residual current at $U_N$	$I_F \leq 10 \text{ mA}$	
Locked rotor protection	Auto restart	
Locked rotor current at $U_N$	$I_{\text{block}}$ approx. $700 \text{ mA}$	
Clock signal at locked rotor	$t_3 / t_4$ typical: $0,5 \text{ s} / 2,8 \text{ s}$	

**Attention:**

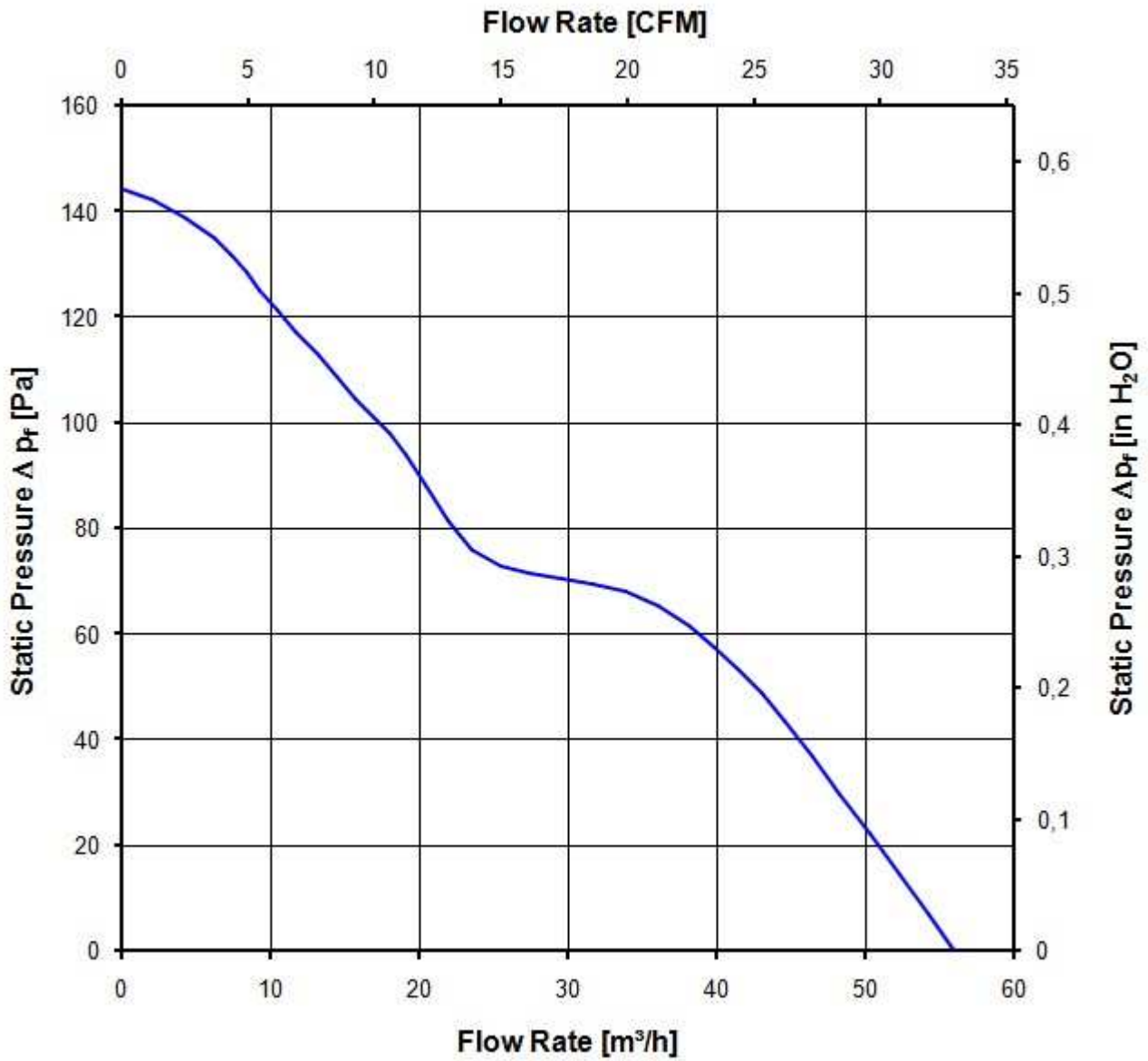
The fan is not protected against continuous rotor locking at overvoltage and max. ambient temperature. Locking protection only up to 24 VDC and  $T_u = 70^\circ\text{C}$ .

### 3.5 Aerodynamics

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. 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:

8.200 1/min at free air flow	PWM 100 %; f: 25 kHz	f: 21 kHz	f: 28 kHz
Max. free-air flow ( $\Delta p = 0 / \dot{V} = \max.$ )	56,0 m <sup>3</sup> /h		
Max. static pressure ( $\Delta p = \max. / \dot{V} = 0$ )	145 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 chapter aerodynamics.

a.) Operation condition:

8.200 1/min at free air flow	PWM 100 %; f: 25 kHz	f: 21 kHz	f: 28 kHz
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Optimal operating point	40,0 m <sup>3</sup> /h @ 51 Pa	
Sound power level at the optimal operating point	5,6 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.	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	

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.	850 VDC / 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	Not applicable

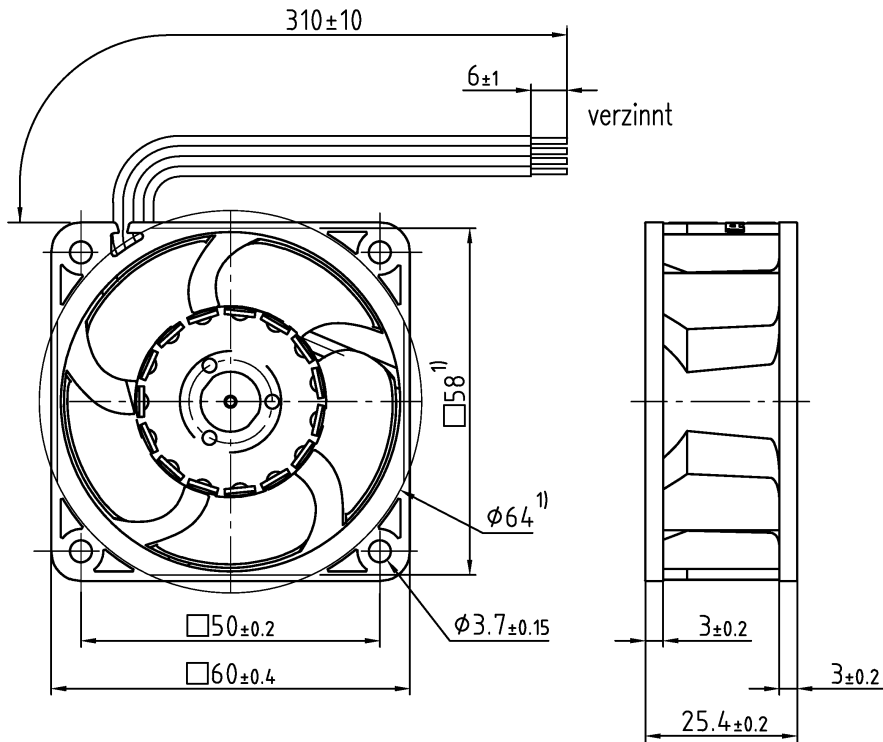
## 6 Reliability

### 6.1 General

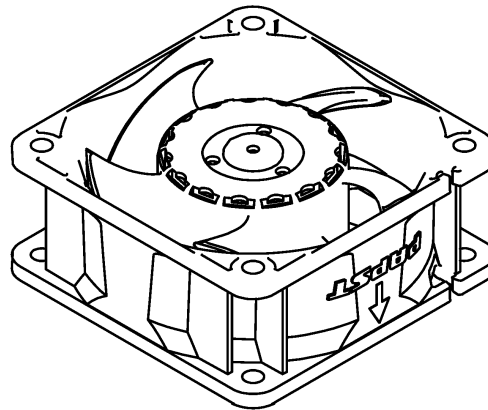
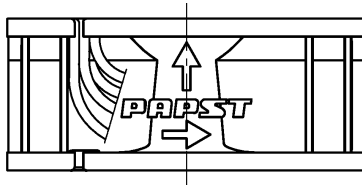
Life expectancy L10 at TU = 40 °C	65.000 h	
Life expectancy L10 at TU max.	32.500 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	110.000 h	

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Schutzvermerk nach DIN ISO 16016 beachten



Flanschseite



Anzahl und Länge der Litzen s. Stückliste

1) Maße für Montagewand

Axialspiel bei

- Kugellagerung (K) : 0 (mit Federausgleich)
- Gleitlagerung (G) :

Tolerierung: DIN 7167		DIN ISO 2768-mK-E			
Allgemeintoleranzen:				Artikel	
	Datum	Name		Maßstab	
Bearbeitet				Zchg.-Nr.	
	Index	Aend.-Nr.	<b>ebmpapst</b>	Blatt	
Geprüft u. zur Verwendung freigegeben von		am		ebm-papst St. Georgen GmbH & Co. KG	Ers.f.Zchg.: