

Product Data Sheet

9592910012

VHS0065XUFBS
RL65-21/14/37HP

ebmpapst

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RL65-21/14/37HP

INDEX

1 General 3

2 Mechanics 3

2.1 General..... 3

2.2 Connections..... 3

3 Operating Data 4

3.1 Electrical Interface - Input..... 4

3.2 Electrical Operating Data 5

3.3 Electrical Interface - Output..... 6

3.4 Electrical Features 7

3.5 Aerodynamics 8

3.6 Sound Data..... 9

4 Environment..... 9

4.1 General..... 9

4.2 Climatic Requirements 9

5 Safety..... 10

5.1 Electrical Safety 10

5.2 Approval Tests 10

6 Reliability..... 10

6.1 General..... 10

1 General

Fan type	Blower	
Rotating direction looking at rotor	Counterclockwise	
Airflow direction	Air in axially, Air out radially	
Bearing system	Ball bearing	
Mounting position - shaft	Any	

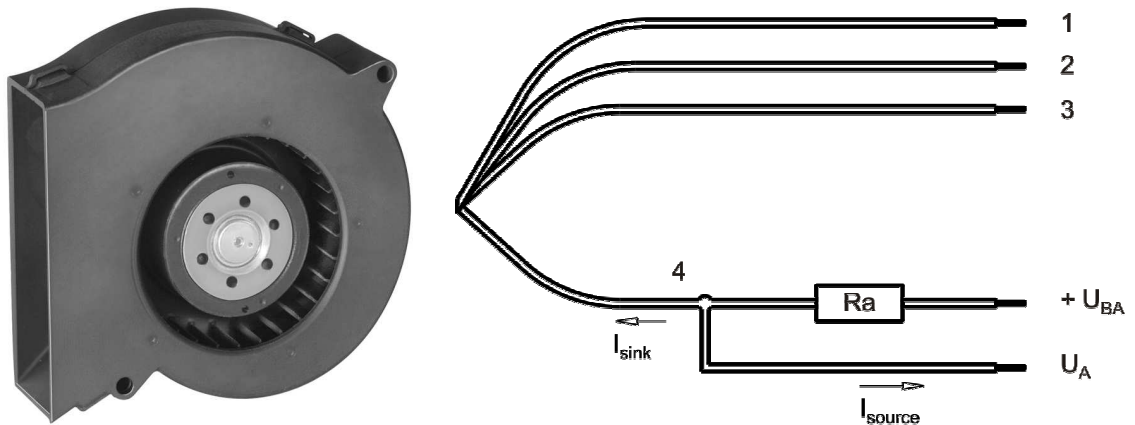
2 Mechanics

2.1 General

Width	97,0 mm	
Height	94,0 mm	
Depth	33,0 mm	
Mass	0,165 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	Wire outlet corner: 60 Ncm Remaining corners: 100 Ncm	
Screw size	ISO 4762 - M4 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 26	1,35 mm
2	blue	- GND	AWG 26	1,35 mm
3	violet	PWM	AWG 26	1,35 mm
4	white	Alarm	AWG 26	1,35 mm

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

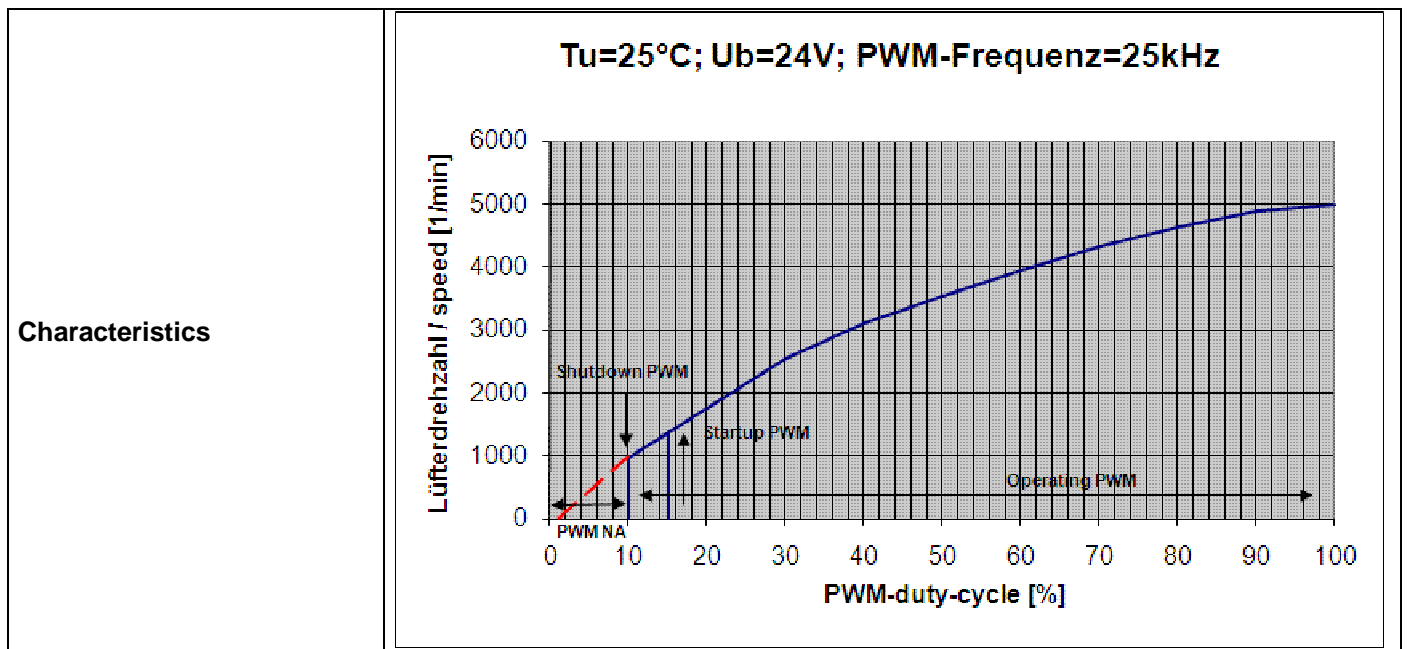
3 Operating Data

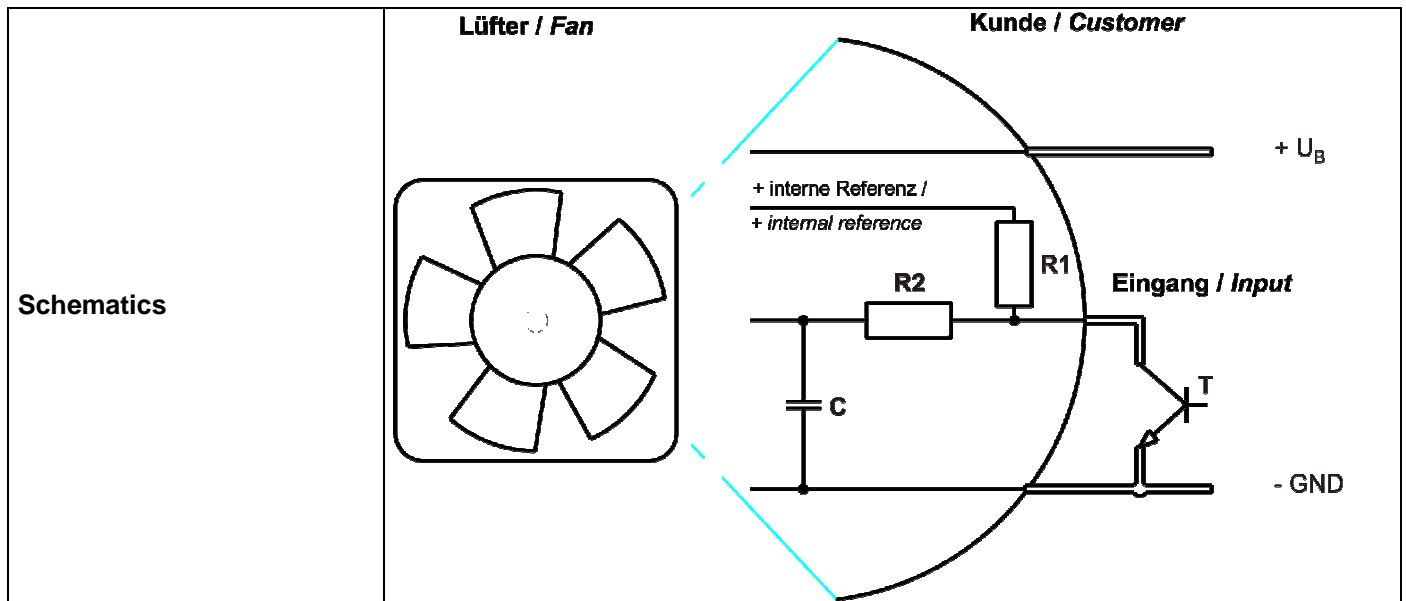
3.1 Electrical Interface - Input

Control input	PWM
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Features

Input type	Open collector	
PWM - Frequency		21 kHz - 28 kHz typical: 25 kHz
4 wire startup condition	PWM duty cycle	$\geq 15\%$
4 wire operation condition after startup	PWM duty cycle	10 % - 100 %
PWM not applicable	PWM n.a.	0 % - 10 %
Shutdown condition	PWM duty cycle	= 0 %
Typical time until warm restart	After shutdown by PWM	8,2 s





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.

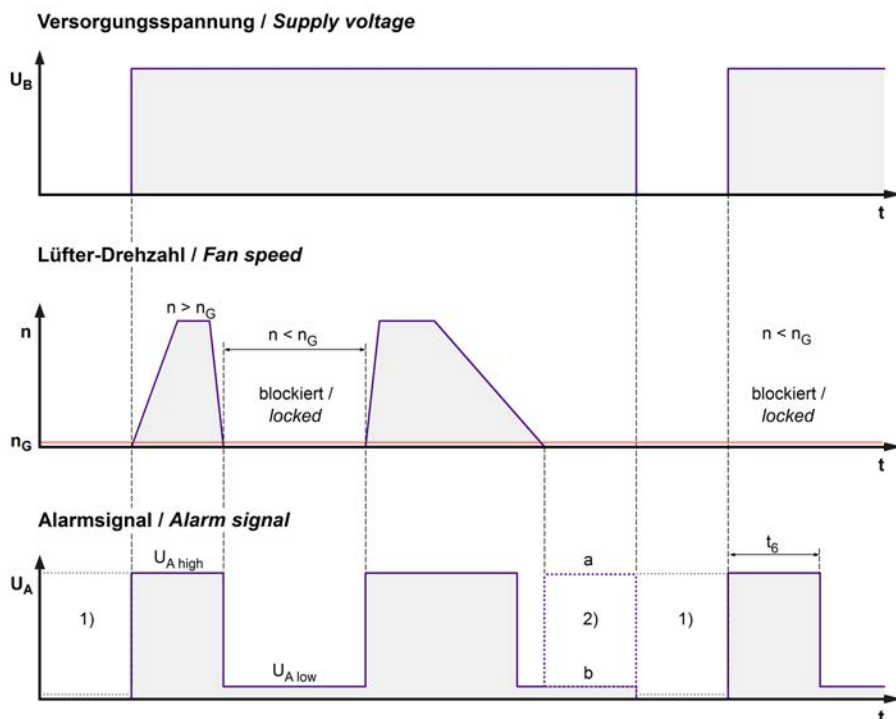
$\Delta p = 0$: corresp. to free air flow (see chapter aerodynamics)
I: corresp. to arithm. mean current value

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

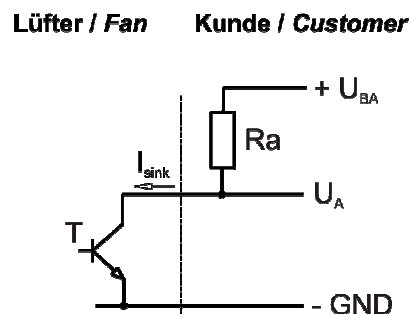
Features	Condition	Symbol	Values		
Voltage range		U	18 V		26,4 V
Nominal voltage		U_N		24,0 V	
Power consumption	$\Delta p = 0$	P	10,9 W	20,0 W	24,4 W
Tolerance	PWM 0010		+/- 17,5 %	+/- 12,5 %	+/- 15,0 %
Current consumption	$\Delta p = 0$	I	605 mA	840 mA	925 mA
Tolerance	PWM 0010		+/- 17,5 %	+/- 12,5 %	+/- 15,0 %
Speed	$\Delta p = 0$	n	4.180 1/min	4.900 1/min	5.330 1/min
Tolerance	PWM 0010		+/- 12,5 %	+/- 7,5 %	+/- 10,0 %
Starting current consumption				3.000 mA	

3.3 Electrical Interface - Output

Alarm type	/37 (high = ok, open collector inverse)
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$$R_a = \frac{U_{BA} - U_{A\text{low}}}{I_{\text{sink}}}$$

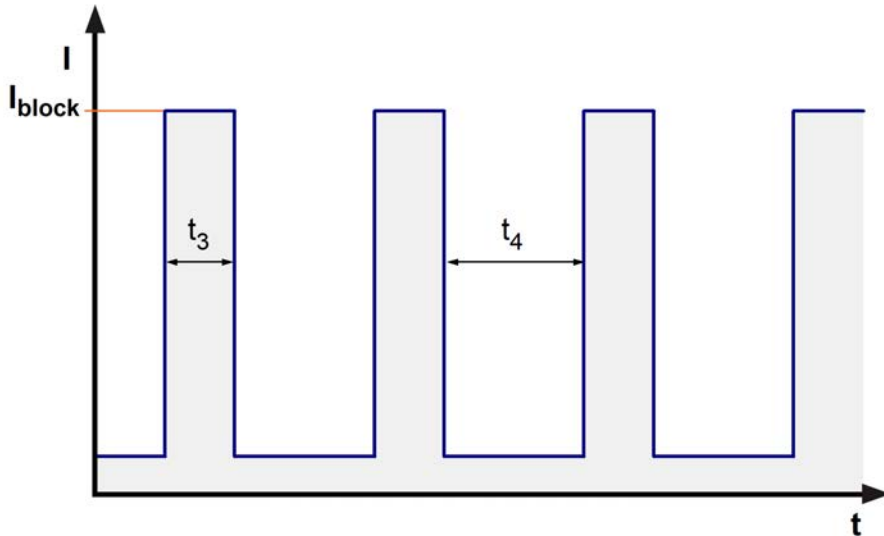


- 1) Wenn der Lüfter abgeschaltet ist, hängt der Zustand des Ausgangssignals U_A von der Kundenapplikation ab.
When the fan is powered off, the output signal U_A depends on the customer's application.
- 2) Für den gültigen Zustand (a oder b) siehe Alarmunterdrückung in der Tabelle.
For the valid condition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

Features	Note	Values
Alarm operating voltage	U_{BA}	$\leq 28 \text{ V}$
Alarm signal Low	$U_{A\text{low}}$	$\leq 0,4 \text{ V}$
Alarm signal High	$U_{A\text{high}}$	28 V
Maximum sink current	I_{sink}	10 mA
External resistor	External resistor R_a from U_{BA} to U_A required. All voltage measured to GND.	
Alarm start-up delay time	t_6	$< 1 \text{ s}$
Alarm trip speed limit	n_G	0 1/min
Alarm at sense failure	No	
Alarm latch	No	
Alarm isolated from motor	No	

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection	Rectifying diode	
Max. residual current at U_N	$I_F < 100 \mu A$	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block} approx. 3.000 mA	
Clock signal at locked rotor	t_3 / t_4 typical: 0,14 s / 8,2 s	



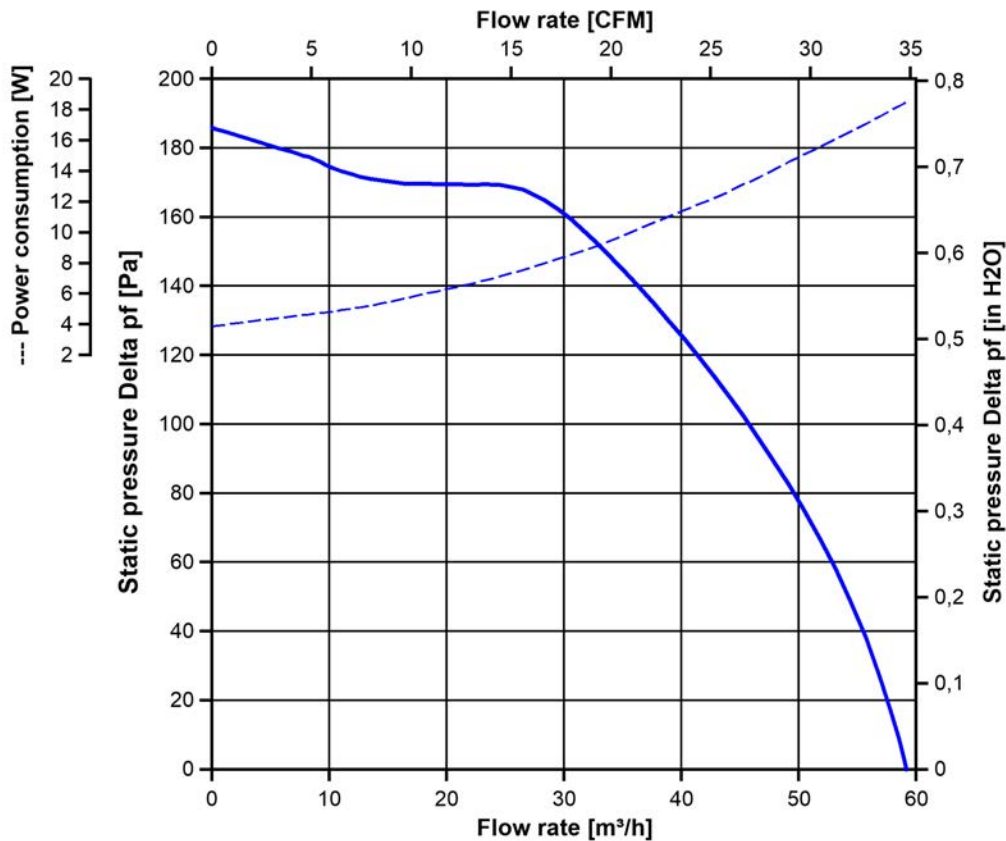
3.5 Aerodynamics

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. 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. Power consumption of the fan motor when operating at normal voltage is shown. Depending on the operating conditions of the application, the power input may be higher.

a.) Operation condition:

4.900 1/min at free air flow	PWM 100 %; f: 25 kHz		
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Max. free-air flow ($\Delta p = 0 / \dot{V} = \text{max.}$)	59 m ³ /h	
Max. static pressure ($\Delta p = \text{max.} / \dot{V} = 0$)	186 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:

4.900 1/min at free air flow	PWM 100 %; f: 25 kHz		
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Optimal operating point	28 m3/h @ 166 Pa		
Sound power level at the optimal operating point	6,3 bel(A)		
Sound pressure level at free air flow, measured in rubber bands			

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C		
Max. permitted ambient temperature TU max.	60 °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 62368 and DIN EN 60335 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. 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 E38324
VDE	Association for Electrical, Electronic and Information Technologies	No
CSA	Canadian Standards Association	Yes
CCC	China Compulsory Certification	Not applicable

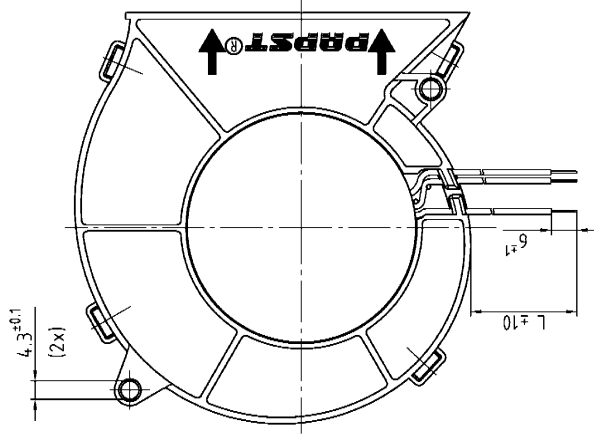
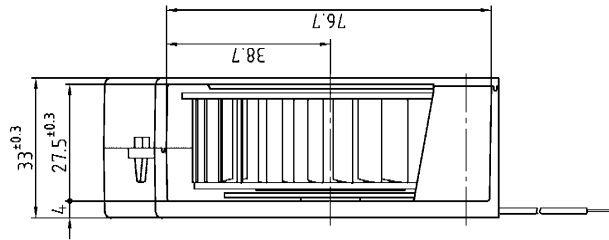
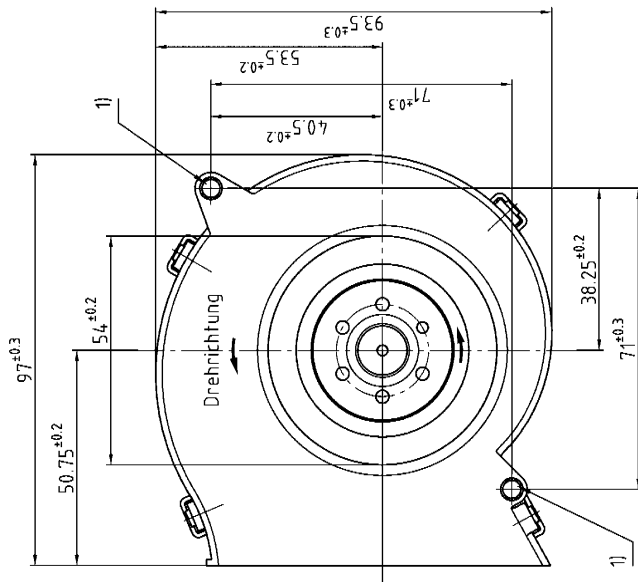
6 Reliability

6.1 General

Life expectancy L10 at TU = 40 °C	55.000 h	
Life expectancy L10 at TU max.	35.000 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	92.5 00 h	

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Anzahl und Länge der Litzen
siehe entspr. SPE-Datei

1) max. Anschraubmoment = 1.3 Nm

Tolerierung Allgemeintoleranzen:				Artikel	MeiBtab
Bezeichnet	Datum	Name			Blatt
Index	Aend.-Nr.			Zitg.-Nr.	
Gepufft u. zur Verwendung freigegeben		PAPST PAPST-MOTOREN GmbH & Co KG D-78127 St. Georgen Germany		Ers.Zitg.	A3
von	an				