

KARTA KATALOGOWA

6318/2TDH4PU

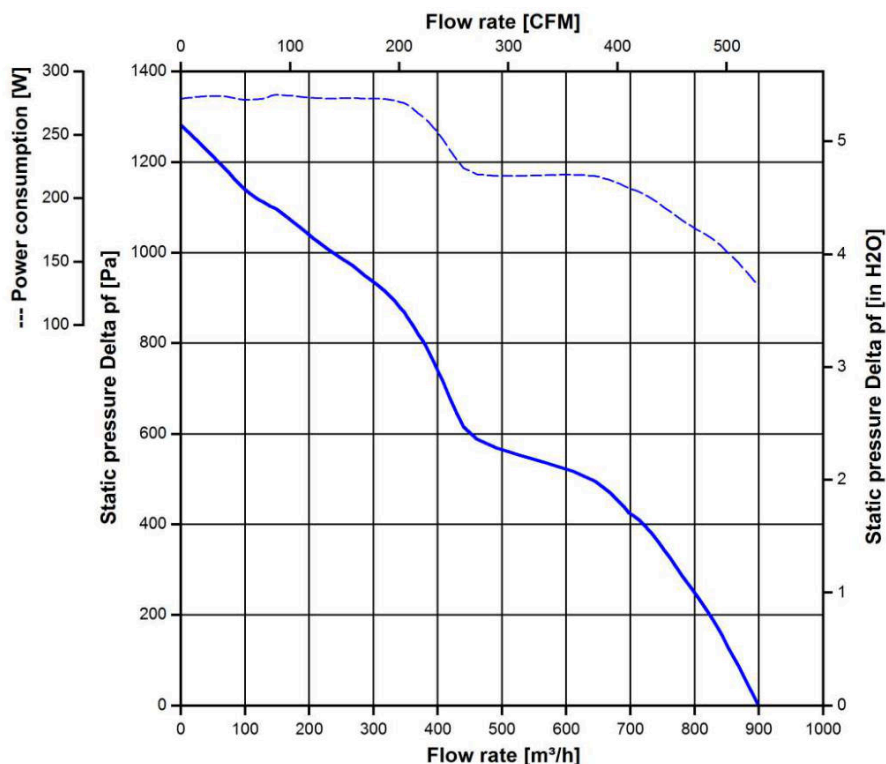
Wentylator osiowy kompaktowy DC

Producent: ebm-papst



Dane znamionowe		Budowa	
Napięcie znamionowe	48 V DC (36...72 V DC)	Wymiary	Ø 172 × 51 mm
Prędkość obrotowa	8900 obr/min	Materiał wirnika	tworzywo sztuczne
Pobór mocy	140 W	Obudowa	metal
Pobór prądu	2900 mA	Kierunek przepływu	wydmuch przez żebra
Wydajność	900 m³/h	Łożyskowanie	kulkowe
Maks. ciśnienie statyczne	1280 Pa	Podłączenie	przewody
Poziom ciśnienia akustycznego	73 dB(A)	Trwałość L10 (40 °C)	52500 h
Poziom mocy akustycznej	8,7 B		
Temperatura otoczenia	-20...+60 °C		

Charakterystyka przepływowa



Dane na okładce odczytane z karty produktu ebm-papst (oryginał na kolejnych stronach).
 Producent zastrzega możliwość zmian.

Dobór, wycena i dostawa – zapytaj LUFTBERG

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Product Data Sheet **9295420046**
VWEG172XKLUZ
6318/2TDH4PU-046

ebm**papst**

engineering a better life



Product Data Sheet

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1 General

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

Please note:

"Sensorless commutation electronic, starting at the first start may not be 100% guaranteed, automatic restart occurs."

2 Mechanics
2.1 General

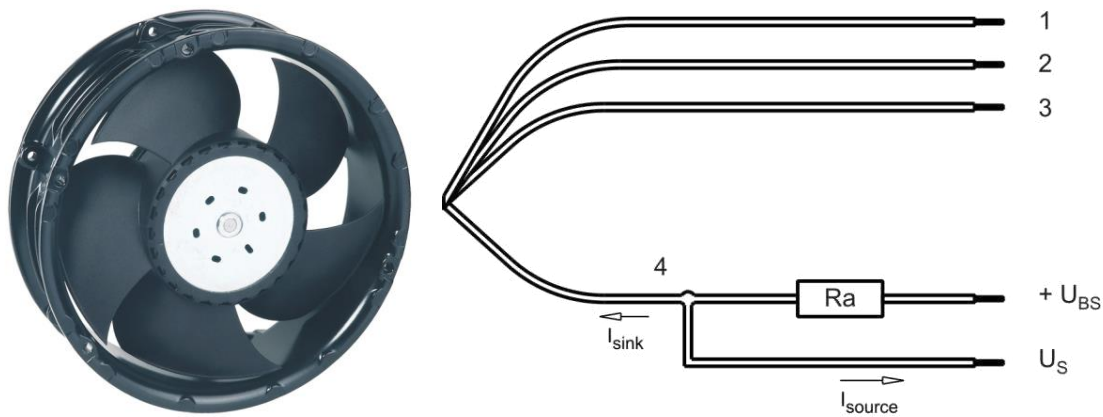
Depth	51,0 mm	
Diameter	172,0 mm	
Mass	0,875 kg	
Housing material	Metal	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	Wire outlet corner: 600 Ncm Remaining corners: 600 Ncm	
Screw size	ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

Electrical connection	Wires	
Lead wire length	L = 365 mm	
Tolerance	+ - 10,0 mm	
Tube length	S = 15 mm	
Tolerance	+ - 5 mm	
Electrical connection		
Lead wire length	See drawing	
Tolerance		

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Wire	Color	Operation	Wire size	Insulation diameter
1	red	+ UB	AWG 18	2,2 mm
2	blue	- GND	AWG 18	2,2 mm
3	violet	PWM	AWG 22	1,7 mm
4	white	Tacho	AWG 22	1,7 mm

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

Lead wire 1 - 2: AWG18 (Insulation diameter 2,20 mm)
Lead wire 3 - 4: AWG22 (Insulation diameter 1,70 mm)

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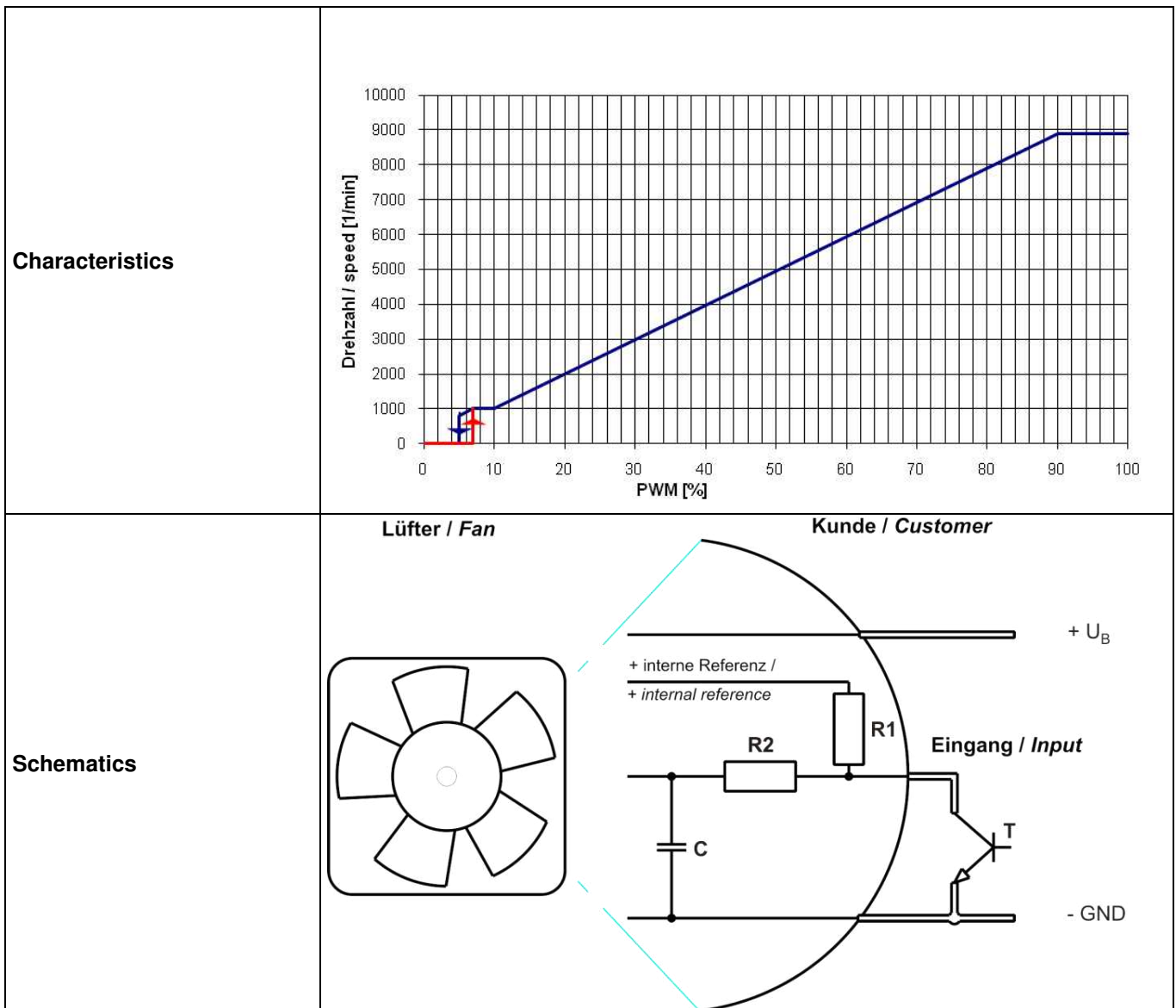
3 Operating Data

3.1 Electrical Interface - Input

Control input	PWM
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Features

Input type	Open collector	
PWM - Frequency		1 kHz - 20 kHz typical: 2 kHz



The shown pull-up resistor to the internal reference voltage (+5V) has 4.7kOhm.

Information to the curve:

0% - ≤7% PWM: 0 1/min (Fan off)
7% PWM: 1.000 1/min (Start-up, coming from 0% PWM)
7% - 10 % PWM: 1.000 1/min (corresp. to min fan speed)

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10% - 90% PWM: Linear increasing curve
 90% - 100% PWM: 8.900 1/min (corresp. to max fan speed)
 5% PWM: 800 1/min or 0 1/min (Fan turns off, coming from 100% PWM)

Transistor Requirements:

VCE max. $\geq 12V$
 Isink max $> 5mA$
 VCEsat $< 0,15V$

3.2 Electrical Operating Data

Measurement conditions: Normal air density = 1,2 kg/m³; Temperature 23°C $\pm$ 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: 95 %; f: 2 kHz

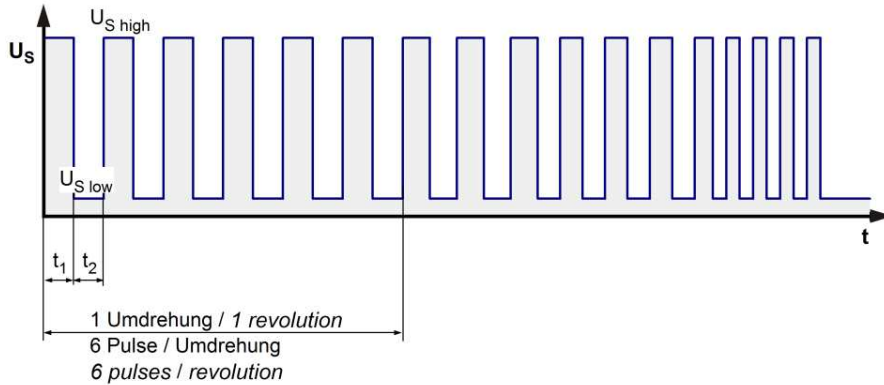
>90% PWM; f = 2 kHz or broken lead wire (open control input)

Features	Condition	Symbol	Values		
Voltage range		U	36 V		72,0 V
Nominal voltage		U _N		48,0 V	
Power consumption	$\Delta p = 0$	P	79 W	140 W	144 W
Tolerance	PWM 0010		$\pm 10 \%$	$\pm 10 \%$	$\pm 10 \%$
Current consumption	$\Delta p = 0$	I	2.200 mA	2.900 mA	2.000 mA
Tolerance	PWM 0010		$\pm 10 \%$	$\pm 10 \%$	$\pm 10 \%$
Speed	$\Delta p = 0$	n	7.500 1/min	8.900 1/min	8.900 1/min
Tolerance	PWM 0010		$\pm 10 \%$	$\pm 5 \%$	$\pm 10 \%$

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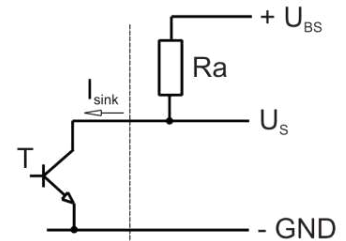
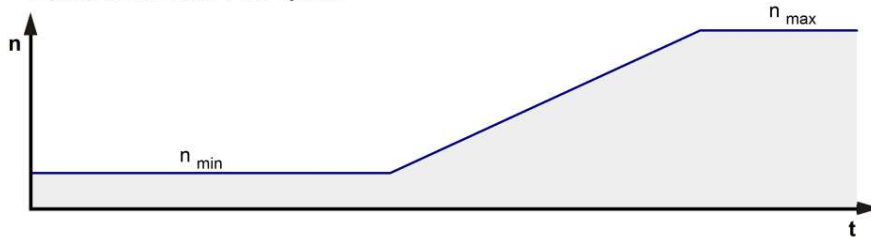
3.3 Electrical Interface - Output

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 / Fan Kunde / Customer


Lüfter-Drehzahl / Fan speed


Features	Note	Values
Tacho operating voltage	U_{BS}	$\leq 60 \text{ V}$
Tacho signal Low	$U_{S \text{ low}}$	$I_{\text{sink}}: 2 \text{ mA}$ $\leq 0,4 \text{ V}$
Tacho signal High	$U_{S \text{ high}}$	$I_{\text{source}}: 0 \text{ mA}$ $60,0 \text{ V}$
Maximum sink current	I_{sink}	$\leq 20 \text{ mA}$
External resistor	External resistor R_a from U_{BS} to U_S required. All voltages measured to GND.	
Tacho frequency	$(6 \times n) / 60$	
Tacho isolated from motor	No	
Slew rate		$\Rightarrow 0,5 \text{ V/us}$

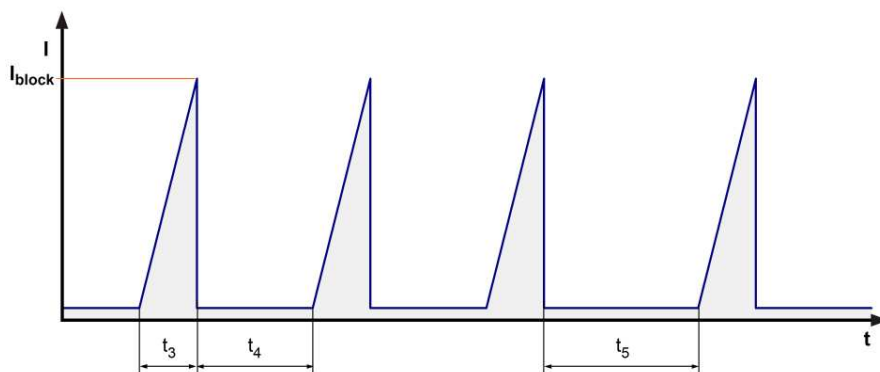
n = revolutions per minute (1/min)

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3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection	P-CH FET	
Max. residual current at U_N	$I_F \leq 5 \text{ mA}$	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block}	
Clock signal at locked rotor	t_3 / t_4 typical: 1,5 s / 10,0 s	



Locked rotor signal t_5 :

After 4 failed start-ups there is an extended timeout of 40 s.

Start-up current @ 48 V ($I = 1 \text{ A/div}$; $t = 2 \text{ s/div}$)

Running current @ 48 V ($I = 1 \text{ A/div}$; $t = 500 \mu\text{s/div}$)

Internal Fuse:

Littelfuse Nano2 Fuse
 Very Fast-Acting 451/453 Series
 10A / 125V

3.5 Data According ErP Directive

Installation / Efficiency category	A / static
Speed control	integrated
Specific ratio	1,00485
Target overall efficiency 2015	29,2 %
Overall efficiency	45,1 %
Efficiency grade	40
Power input	198 W
Speed	8.860 1/min

All values measured in optimum energy efficiency point.

Productiondatecode is printed on the fan label.

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3.6 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;

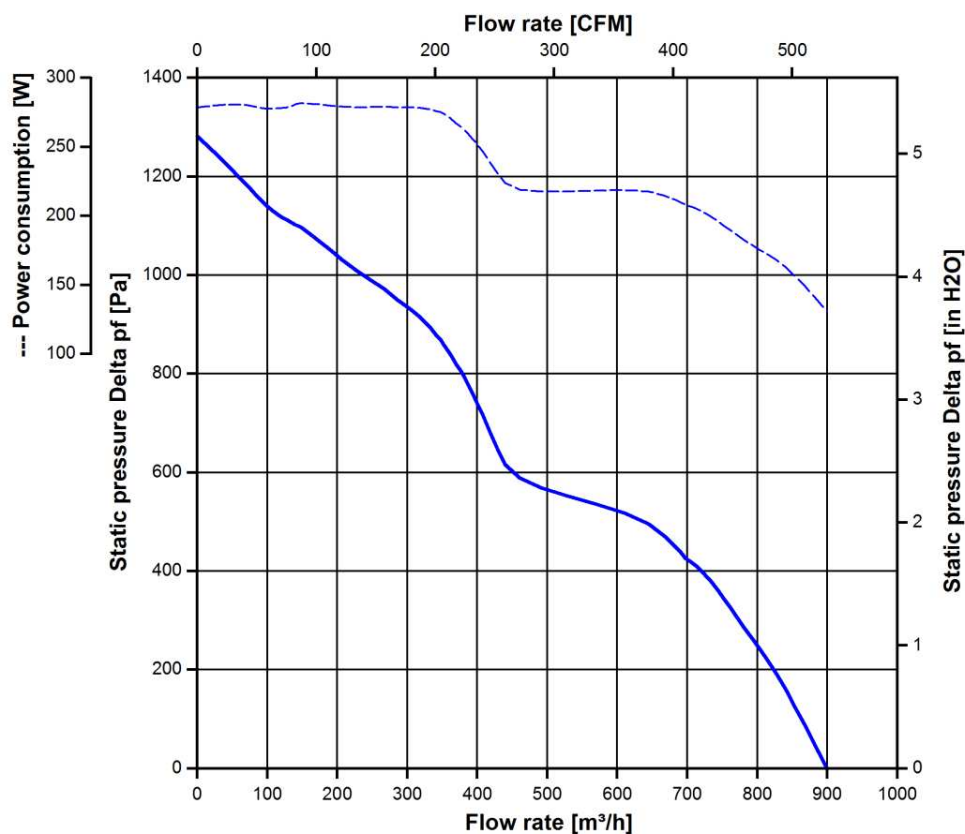
In the intake and outlet area should not be any solid obstruction within 0,5 m. Motor shaft horizontal.

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:

8.900 1/min at free air flow	PWM 95 %; f: 2 kHz		
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Max. free-air flow ($\Delta p = 0$ / $\dot{V} = \max.$)	900,0 m ³ /h	
Max. static pressure ($\Delta p = \max.$ / $\dot{V} = 0$)	1.280 Pa	



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3.7 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 semianechoic chamber with a background noise level of $L_p(A) < 5 \text{ dB(A)}$
 For further measurement conditions see chapter aerodynamics.

a.) Operation condition:

8.900 1/min at free air flow	PWM 95 %; f: 2 kHz		
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Optimal operating point	863,0 m ³ /h @ 83 Pa	
Sound power level at the optimal operating point	8,7 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	73,0 dB(A)	

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	

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4.2 Climatic Requirements

IP-protection type (certified)	IP 68 (for fan only, not for connector if applicable) **)	
Humidity requirements	humid temperature, cyclic; according to DIN EN 60068-2-38, 10 cycle and condensation water check; according to DIN EN ISO 6270-2, 14 days	
Salt fog requirements	salt fog, cyclic, in operation; according to DIN EN 60068-2-52, 3 cycle	

Permitted application area:

The product is for the use in open and unsheltered areas. Direct exposure to water as well as saline ambient conditions are allowed provided that this does not prevent the normal operation.

Pollution degree 3 (according DIN EN 60664-1)

It occurs conductive pollution or dry non-conductive pollution which becomes conductive due to condensation.

**) The specification of the IP protection refers to the conditions mentioned in certification of the fan. The above mentioned short description of the protection scope is not final. For detailed information of the respective protection scope and definitions, see certification as well as DIN EN 60529 (protection by housings) and ISO 20653 (for vehicles) with the letter K.

Short description of the IP-protection type:

Solid particle Protection: Dust tight.

Protection against deliberate contact: Protected against contact to hazardous parts with a wire.

Protection against water: The fan test according to IP68 (Based on IEC 60529), is conducted in non-operating mode. The fan is tested by a complete immersion in water for a period of 2h at a water-level of 1,2m. Electrical connections are not immersed since they are customer specific.

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4.3 Mechanical Requirements

severity level	Vibration (sinusoidal)	
0,5 G	Vibration (sinusoidal) in use IEC 60068-2-6 Displacement / frequency range Acceleration / frequency range Sweep rate Sweep cycles Duration Axes of vibration	Vibration (sinusoidal) 0,035 mm / 10-60, 60-10 Hz 0,5 G / 60-500-60 Hz 1 Oct./min 10 2 hrs. 3

severity level	stationary use		
1	storage / transportation	Random vibration not in use IEC 60068-2-64 Frequency range / ASD G _{RMS} Axes of vibration Test duration	Random vibration 5 - 20 Hz : 1,0 m ² / s ³ 20 - 500 Hz : - 3 dB / Oct 0,91 G 3 3 x 5 h
	storage / transportation	Bump not in use IEC 60068-2-29 Shock spectrum Acceleration Duration Number of bumps (+X, -X, -Y, +Y, -Z, +Z) Total bumps	Bump half sine 18 G 6 ms 100 in each direction 600
	stationary use	Random vibration in use IEC 60068-2-64 Frequency range / ASD G _{RMS} Axes of vibration Test duration	Random vibration 5 - 20 Hz : 2,0 m ² / s ³ 20- 150 Hz : - 3 dB / Oct 0,83 G 3 3 x 5 h
	stationary use	Bump in use IEC 60068-2-29 Shock spectrum Acceleration Duration Number of bumps (+X, -X, -Y, +Y, -Z, +Z) Total bumps	Bump half sine 5 G 11 ms 100 in each direction 600

severity level	Railroad application	
1 IEC 61373 Category 1	Random vibration in use IEC 60068-2-64 Frequency range / ASD	Random vibration 5 - 20 Hz : 2,0 m ² / s ³

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Class B	GRMS Axes of vibration Test duration	20- 150 Hz : - 3 dB / Oct 0,83 G 3 3 x 5 h
	Shock in use IEC 60068-2-27 Shock spectrum Acceleration Duration Number of bumps (+X, -X, -Y, +Y, -Z, +Z) Total bumps	Shock half sine 7 G 18 ms 10 in each direction 60

Notice:

In the case of external excitation, noise may increase due to resonance vibrations. Under this conditions the fan should not be operated in the resonance range.

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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.	1000 VAC / 1 Min. 1700 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 / 1,5 mm	
Protection class	I	

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	Yes / Approval acc. to EN 62368 - Audio/video, information and communication 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

The approval tests are observed to:

U approval max.: 72 V @ TU approval max.: 60 °C

6 Reliability
6.1 General

Life expectancy L10 at TU = 40 °C	52.500 h	
Life expectancy L10 at TU max.	32.500 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	87.500 h	



butylacrylate nach DIN ISO 18016 beachten !
 refer to protection notice DIN ISO 18016 !

1:2



- Axialspiel der Kugellager mit Feder spielfrei verspannt.
 1.) Maße für Montageausschnitt
 2.) Anzahl und Länge der Litzen und des Schlauchs
 siehe Produktspezifikation.

- Ball bearings without axial clearance by a pre-loaded spring.
 1.) Dimensions for mounting cut-out.
 2.) Number and length of wires and tube see product specification.

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Document Status / Document State		DATA-Version / DATA-Version	Doc. (Signature) / Doc. (Signature)	Quantity / Volume (m³):
		TECHNICAL DATA		Weight / Mass (t):
 Rev. # / Change #		Articles / Titles:		
		3D References:		
Tolerancing / Tolerances: 		(Part / Frame)		
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