Product Data Sheet

9295420004
VWS0148XULDS
6314/2TDHP

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The engineer's choice



GREEN TECH

6314/2TDHP

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 9
3.6 Sound Data 10
4 Environment 10
4.1 General 10
4.2 Climatic Requirements 10
5 Safety 11
5.1 Electrical Safety 11
5.2 Approval Tests 11
6 Reliability 11
6.1 General 11

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

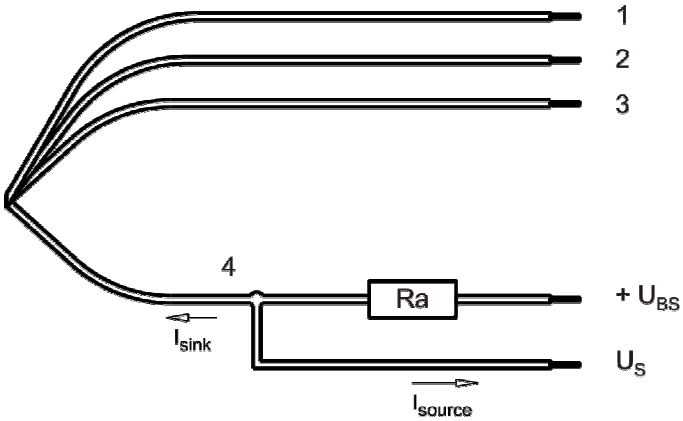
2.1 General

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 Screw size	Wire outlet corner: 600 Ncm Remaining corners: 600 Ncm ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

Electrical connection	Wires	
Lead wire length Tolerance	L = 365 mm +- 10,0 mm	
Tube length Tolerance	S = 10 mm +- 2,0 mm	





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

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

3 Operating Data

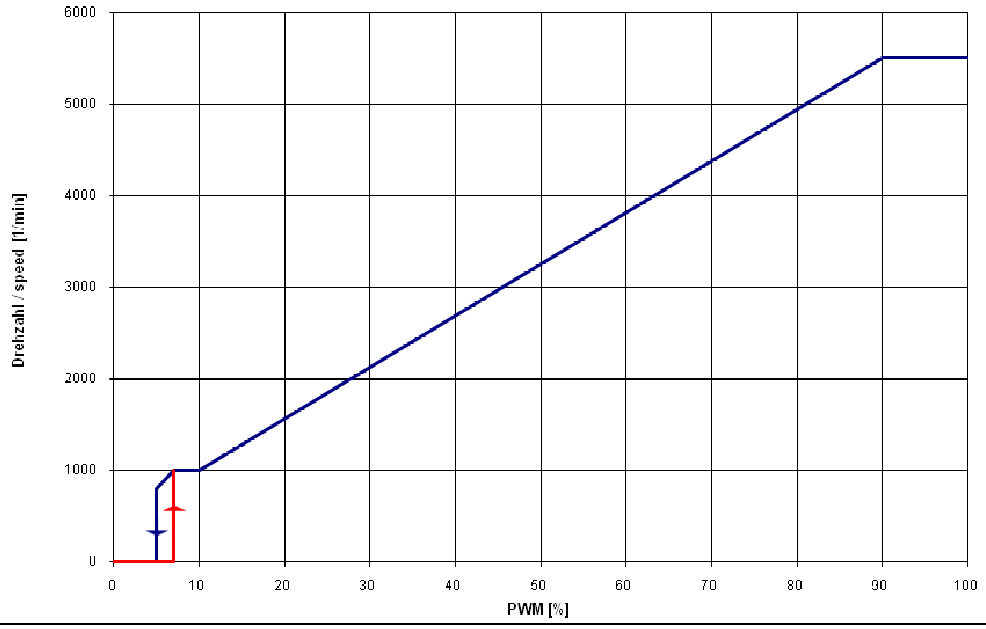
3.1 Electrical Interface - Input

Control input	PWM

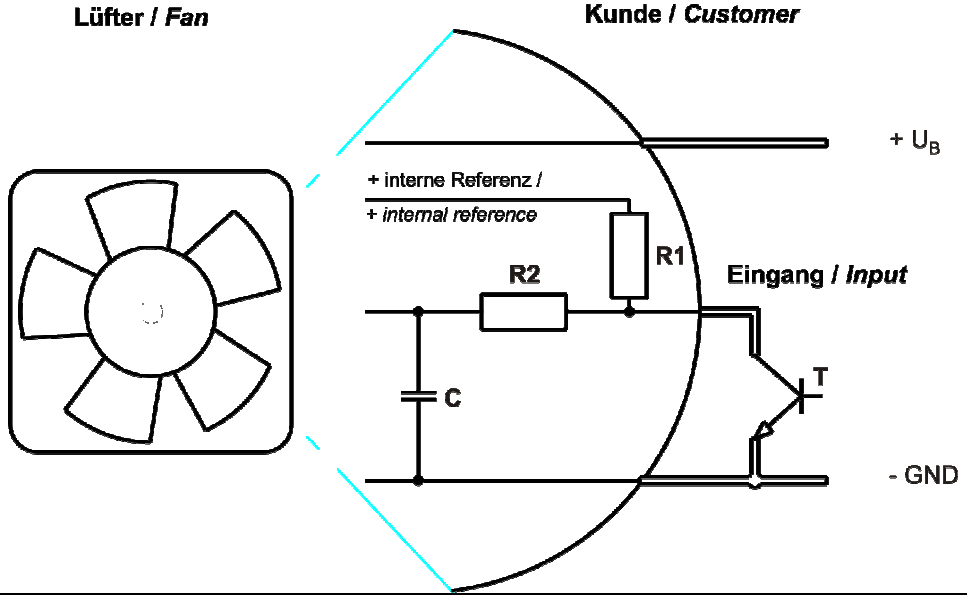
Features

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

Characteristics



Schematics



Information to the curve:

0 % - 7% PWM: 0 1/min
7 % PWM: 1.000 1/min (Fan on, comming from 0% PWM)

7 % - 10% PWM: 1.000 1/min (corresponding to min. speed)
10 % - 90% PWM: linear increasing curve
90 % - 100% PWM: 5.500 1/min (corresponding to max. speed)
7 % - 5 % PWM: linear decreasing curve (comming from 100% PWM)
5 % PWM: 800 1/min or 0 1/min (Fan off, comming from 100% PWM)

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: 95 %; f: 2 kHz		

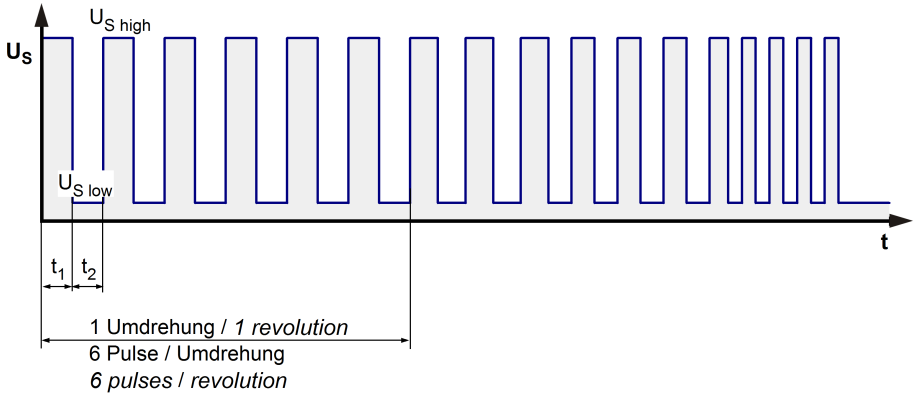
100% PWM or broken lead wire (open control input)

Features	**Condition**	**Symbol**	**Values**		
Voltage range		U	16 V		36 V
Nominal voltage		U_N		24 V	
Power consumption Tolerance	$\Delta p = 0$ PWM 0010	P	20,5 W +- 10 %	41 W +- 10 %	38 W +- 10 %
Current consumption Tolerance	$\Delta p = 0$ PWM 0010	I	1.280 mA +- 10 %	1.700 mA +- 10 %	1.055 mA +- 10 %
Speed Tolerance	$\Delta p = 0$ PWM 0010	n	4.500 1/min +- 7,5 %	5.500 1/min +- 5 %	5.500 1/min +- 5 %

3.3 Electrical Interface - Output

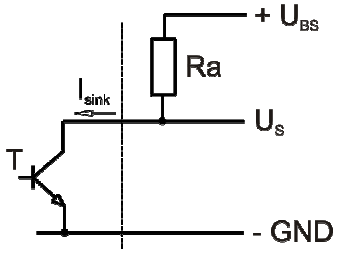
Tacho type	/2 (open collector)

Signal-Ausgangsspannung / *Signal output voltage*

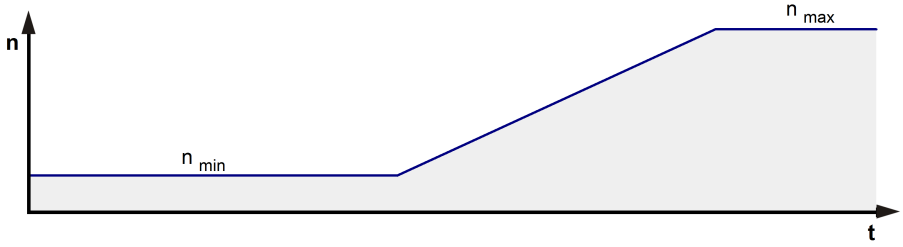


$$Ra = \frac{U_{BS} - U_{S\,low}}{I_{sink}}$$

Lüfter / *Fan* **Kunde / *Customer***



Lüfter-Drehzahl / *Fan speed*



Features		**Note**	**Values**
Tacho operating voltage	U_{BS}		<= 60,0 V
Tacho signal Low	$U_{S\,low}$	I sink: 2 mA	<= 0,4 V
Tacho signal High	$U_{S\,high}$	I source: 0 mA	<=60,0 V
Maximum sink current	I_{sink}		<= 20 mA
External resistor		External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency		(6 x n) / 60	550 Hz @ 5.500 1/min
Tacho isolated from motor		No	
Slew rate			=> 0,5 V/us

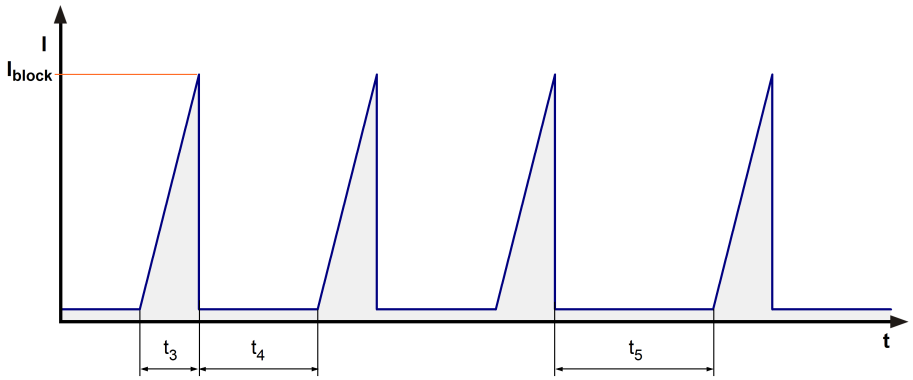
n = revolutions per minute (1/min)

Please note:
At zero speed the tacho signal is at a static HIGH. It will be also HIGH when the fan is still spinning, but the speed control signal is set to zero speed already.
The tacho signal is only activated after the start-up is completed.

3.4 Electrical Features

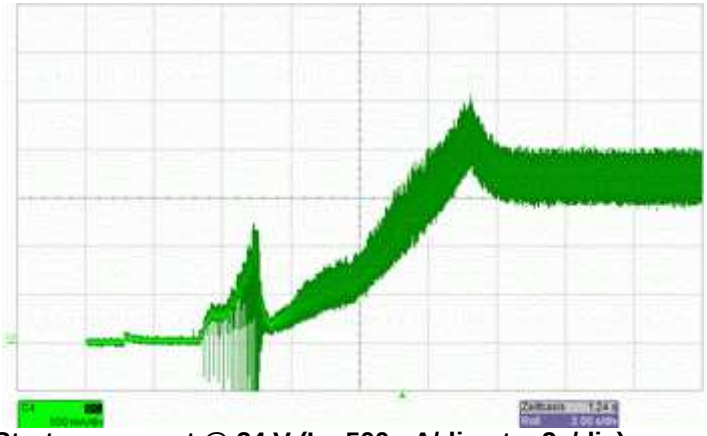
Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at U_N	P-CH FET I_F <= 5 mA	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block}	
Clock signal at locked rotor Extended Downtime	t_3 / t_4 typical: 2,7 s / 10,0 s t_5: 40 s after 4 start-up tests	
Internal fuse	Littelfuse NANO2 > Very Fast-Acting > 451/453 Series 7A / 125V (Art.No.: 0451007.MRL)	
Voltage control *)	Fan turns on at U_B > 14 V or < 40 V Fan turns off at U_B < 13 V or > 42 V	

*) This fan has an undervoltage and overvoltage control circuit integrated which turns the motor off if the voltage is out of range.

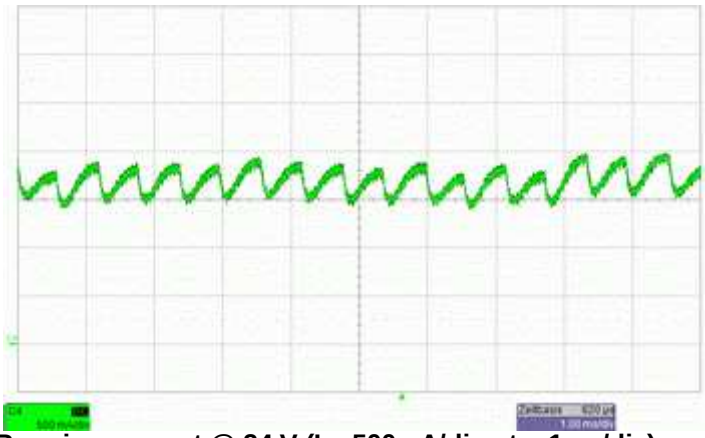


First locked rotor off time is reduced to 3 seconds.

This fan has a startup delay of 2 seconds after applying supply voltage.



Start-up current @ 24 V (I = 500mA/div ; t = 2s/div)



Running current @ 24 V (I = 500mA/div ; t = 1ms/div)



Locked rotor current @ 24 V (I = 0,5A/div ; t = 1s/div)

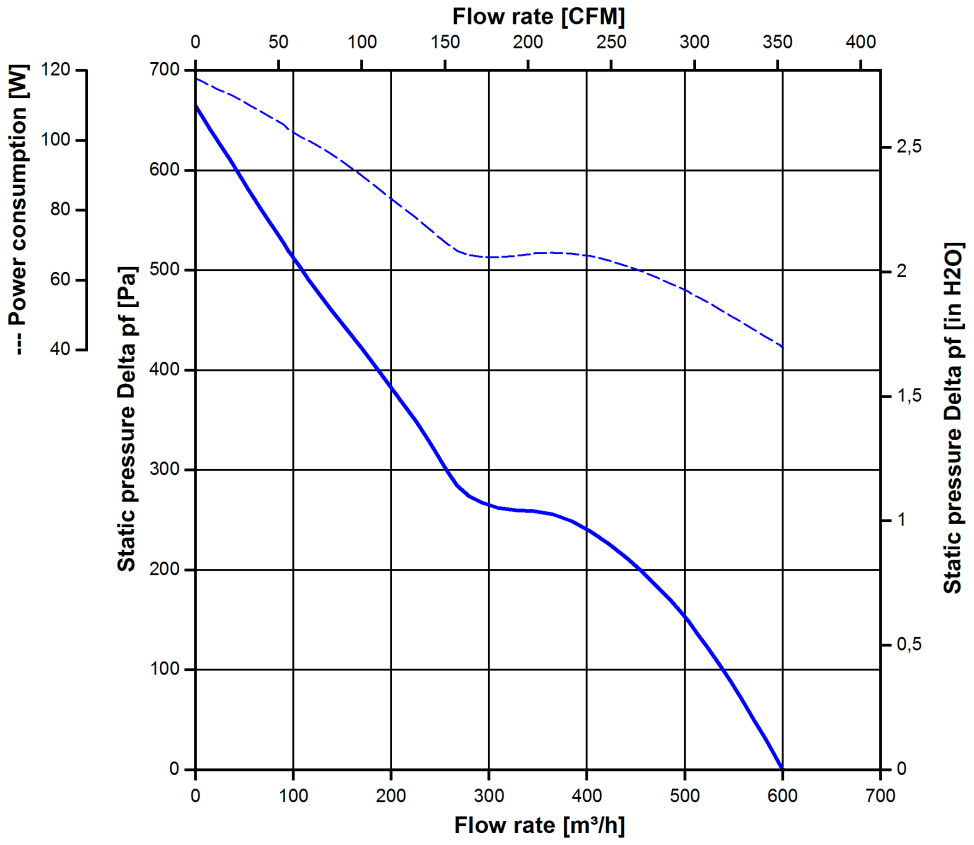
3.5 Aerodynamics

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:

5.500 1/min at free air flow	PWM 95 %; f: 2 kHz		

Max. free-air flow (Δp = 0 / V̇ = max.)	600 m3/h	
Max. static pressure (Δp = max. / V̇ =0)	655 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 Lp(A) < 5 dB(A) For further measurement conditions see chapter aerodynamics.

a.) Operation condition:

5.500 1/min at free air flow	PWM 95 %; f: 2 kHz		

Optimal operating point	505 m3/h @ 123 Pa	
Sound power level at the optimal operating point	7,2 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	63,0 dB(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	75 °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℃. 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

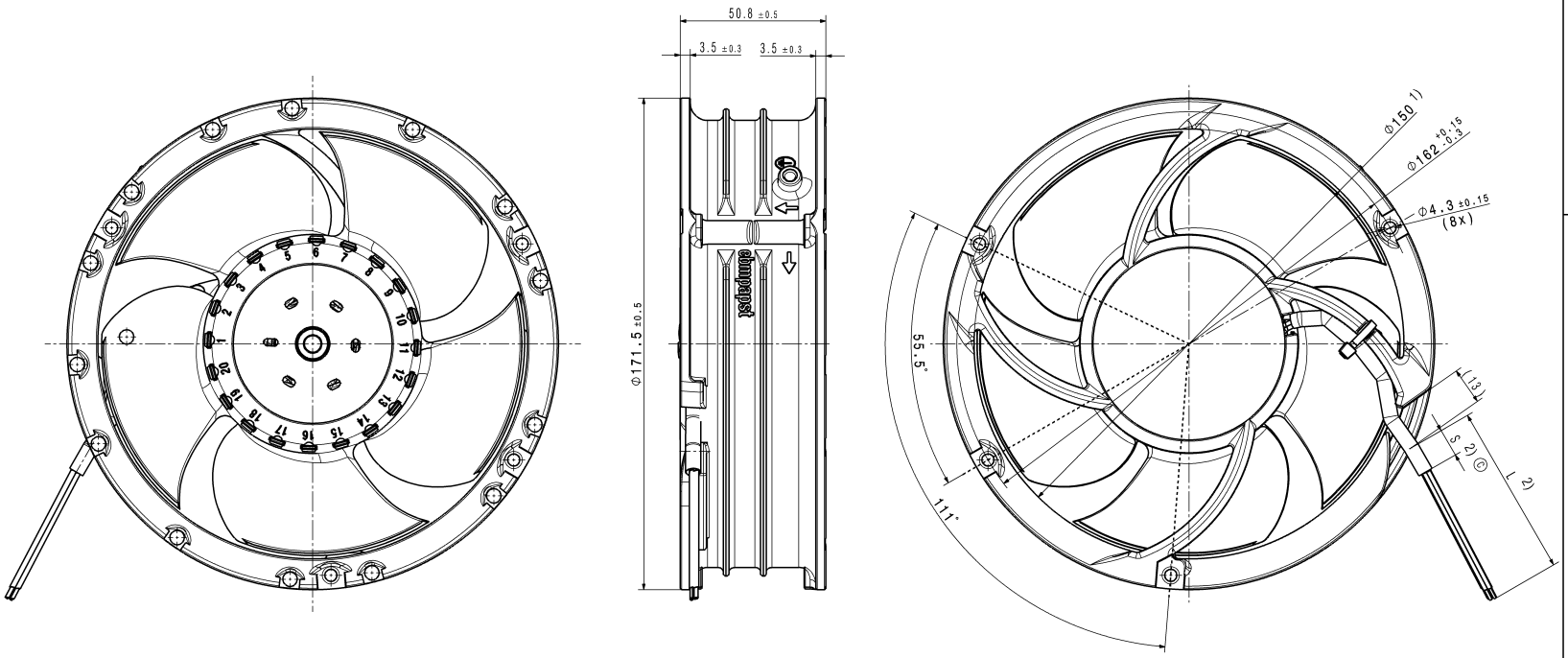
CE	EC Declaration of Conformity	No
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans E38324
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Canadian Standards Association	Yes / C22.2 No. 113 Fans and Ventilators
CCC	China Compulsory Certification	Not applicable

The approval tests are observed to:
U approval max.:36,0 V @ TU approval max.: 70,0 ℃

6 Reliability

6.1 General

Life expectancy L10 at TU = 40 ℃	70.000 h	
Life expectancy L10 at TU max.	35.000 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 ℃	117. 500 h	



- Axialspiel der Kugellager mit Feder spielfrei gelagert
1) Maße für Montageausschnitt
2) Anzahl und Länge der Litzen und des Schlauches siehe Produktspezifikation
Ⓒ

- ball bearing without clearance by a pre-load spring
1) measures of mounting cut out
2) length an number of wires and tube see product specification
Ⓒ

BAP-Status/State	Aand.-Nr./ Change-No.	CATIA-System-Version/ CATIA-System-Version	CAD-Umgebung/ CAD-Environment	Werkstoff / Material:	Volumen / Volume (mm³):
		Datum	Name		Gewicht / Mass (g):
		Bearb./ Drawn		Artikel / Title:	
Tolerierung / Tolerances:		Gepr./ Checked			
		Freig./ Releas.			
Allgemeintoleranzen / Gen. Tolerances:		ebmpapst		Zchg.-Nr./ Drawing No:	Ers.f.Zchg. / Replaces:
		ebm-papst St.Georgen GmbH & Co KG		Dokumenttyp / Type of Document	Teildokument (Blatt/Page)	Index / Index	Format / Size:	Massstab/Scale

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