Product Data Sheet 9295420052

VWS0148XULDS
6314/2TDHHPU

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The engineer's choice

6314/2TDHHPU (9295420052) ebmpapst Datasheet FansCo sales@fansco.com www.fansco.com

GREEN TECH

6314/2TDHHPU

INDEX

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	

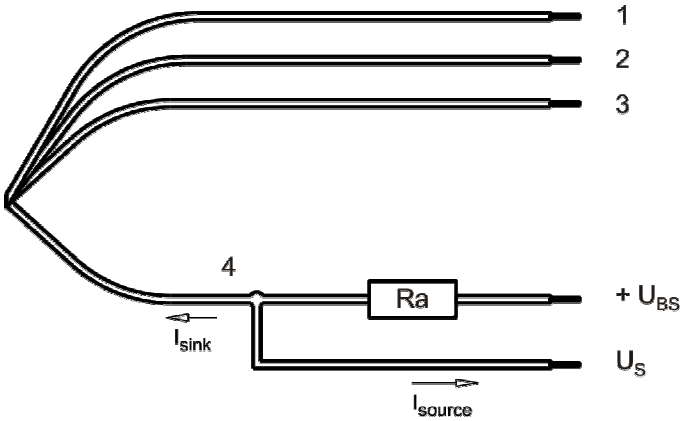
2 Mechanics

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

3 Operating Data

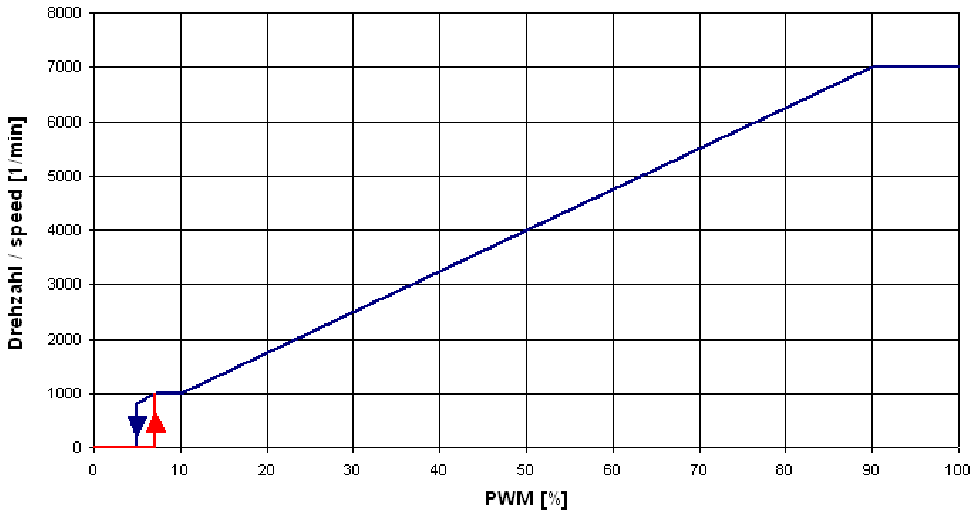
3.1 Electrical Interface - Input

Control input	PWM

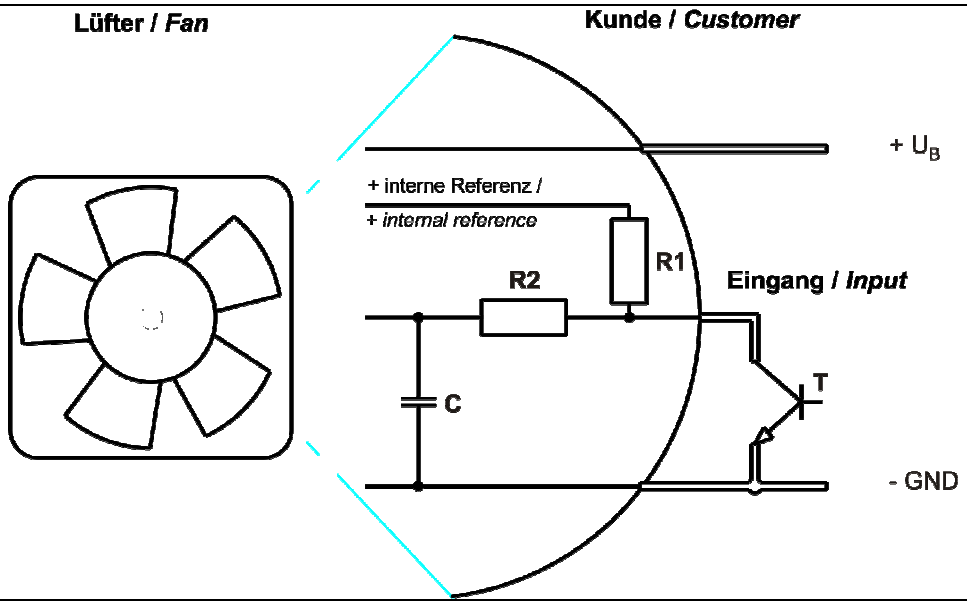
Features

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

Characteristics



Schematics



The shown pull-up resistor R1 to the internal reference voltage (+5V) has 4.7kOhm.

Information to the curve:

0% - <=7%	PWM:	0 1/min
7% - 10%	PWM:	1.000 1/min (corresponding to min. speed)
10% - 90%	PWM:	linear increasing curve
90% - 100%	PWM:	7.000 1/min (corresponding to max. speed)
7% PWM:		1.000 1/min (Fan on, comming from 0% PWM)
7% - 5%	PWM:	linear decreasing curve (von 100% PWM kommend)
5% PWM:		800 1/min or 0 1/min (Fan off, comming from 100% PWM)

Transistor requirements:
Vce max. >= 12V; Isink max. >=5mA; Vce sat. <= 0,15V

3.2 Electrical Operating Data

Measurement conditions: Normal air density = 1,2 kg/m3; Temperature 23℃ +/ - 3℃; 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

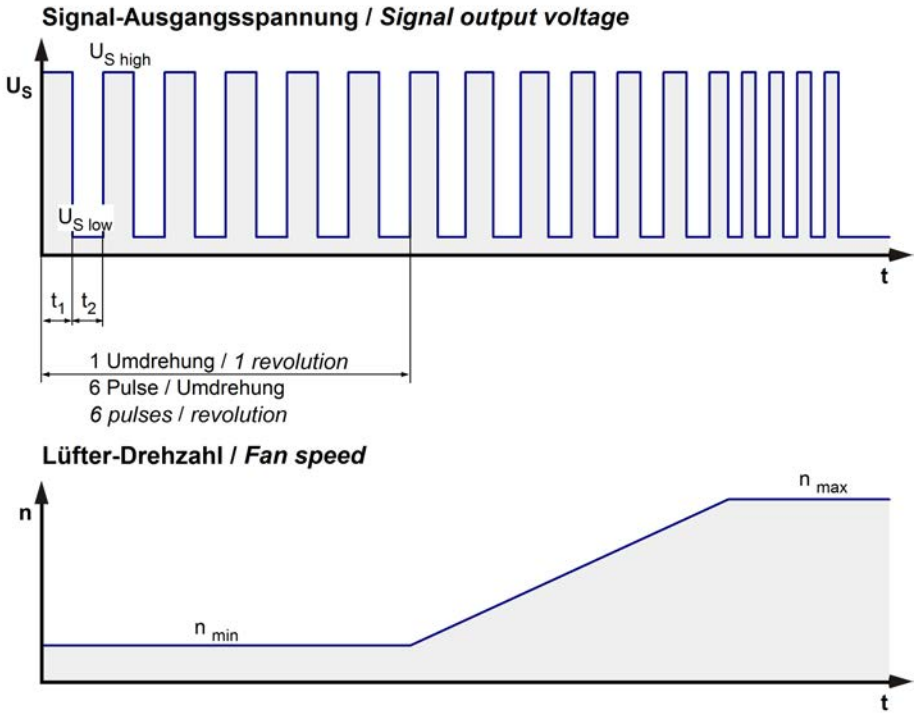
Name	Condition		
PWM 0001	PWM: 95 %; f: 2 kHz		

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

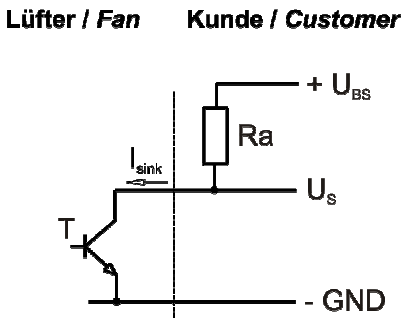
Features	Condition	Symbol	Values		
Voltage range		U	16 V		36 V
Nominal voltage		U_N		24,0 V	
Power consumption Tolerance	Δp = 0 PWM 0010	P	37 W +- 10 %	70 W +- 10 %	70 W +- 10 %
Current consumption Tolerance	Δp = 0 PWM 0010	I	2.300 mA +- 10 %	2.800 mA +- 10 %	1.850 mA +- 10 %
Speed Tolerance	Δp = 0 PWM 0010	n	5.750 1/min +- 7,5 %	7.000 1/min +- 5 %	7.000 1/min +- 5 %

3.3 Electrical Interface - Output

Tacho type	/2 (open collector)



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



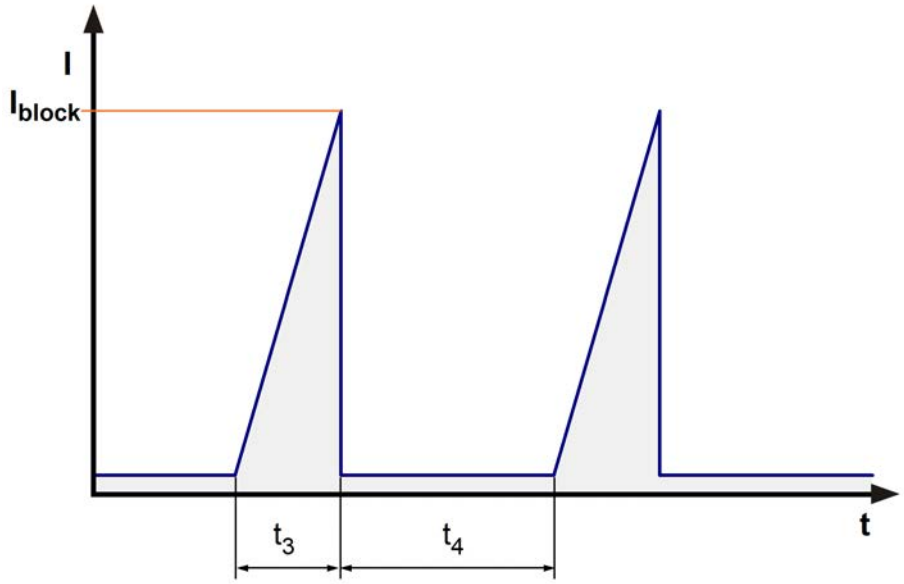
Features		Note	Values
Tacho operating voltage	U_{BS}		<= 32 V
Tacho signal Low	$U_{S\,low}$	I sink: 2 mA	<= 0,4 V
Tacho signal High	$U_{S\,high}$	I source: 0 mA	<=32 V
Maximum sink current	I_{sink}		<= 20 mA
External resistor		External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency		(6 x n) / 60	
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} approx. 2.000 mA	
Clock signal at locked rotor	t_3 / t_4 typical: 4 s / 11,0 s	
Internal fuse	Littelfuse NANO2 > Very Fast-Acting > 451/453 Series 10A / 125V (Art.No.: 0451010.MRL)	



After 4 unsuccessful start up trys the fan will be turned off for 40 seconds. .

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

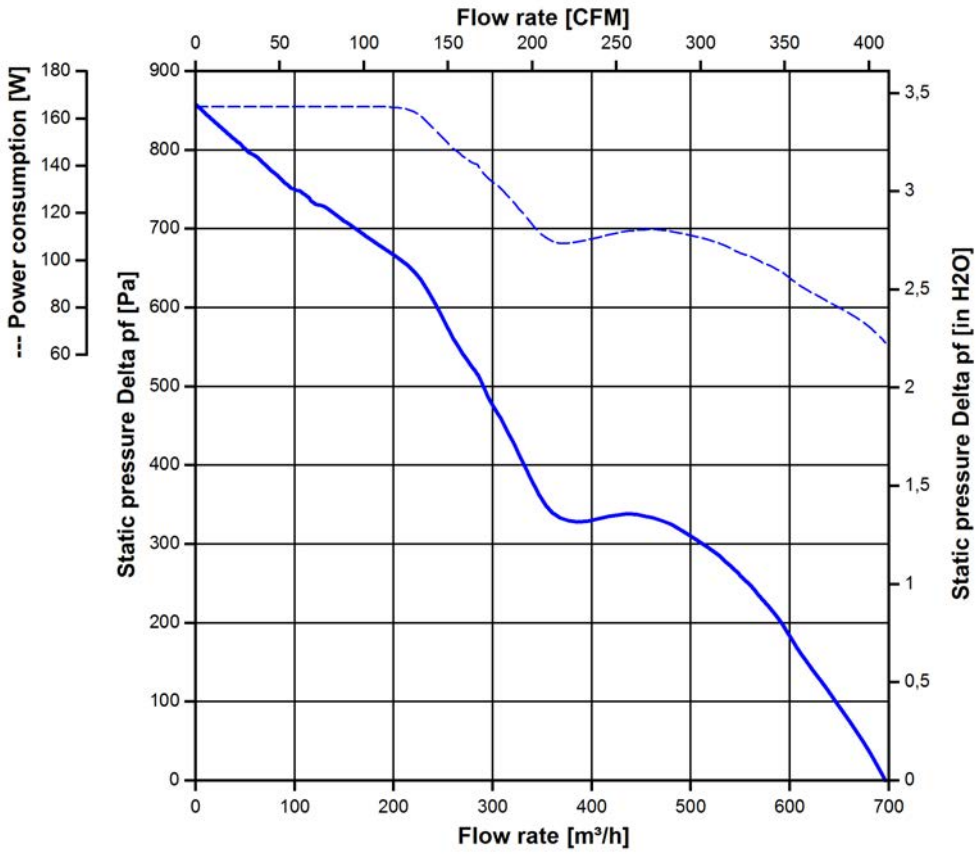
3.5 Aerodynamics

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. 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:

7.000 1/min at free air flow	PWM 95 %; f: 2 kHz		

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	697 m3/h	
Max. static pressure (Δp = max. / $\dot{V}$ =0)	860 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:

7.000 1/min at free air flow	PWM 95 %; f: 2 kHz		

Optimal operating point	680 m3/h @ 35 Pa	
Sound power level at the optimal operating point	8 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	68 dB(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	65 °C	
Min. permitted storage temperature TL min.	-40 °C	
Max. permitted storage temperature TL max.	80 °C	

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	None	

Permitted application area:
The product is for the use in partial sheltered rooms or open, roofed areas. Direct exposure to water is allowed provided that this does not prevent the normal operation. Saline ambient conditions must be avoided.

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.

Please require severity levels and specification parameters from the responsible development departments.

4.3 EMC

Kind	**Radiated Emission; 30 MHz - 1000 MHz**
According	DIN EN 55032:2016-02
Ceck accuracy / Limit	Class A
Result	Below limit Class B

Kind	**Electrostatic Discharge Immunity Test**
According	DIN EN 61000-4-2:2001-12
Ceck accuracy / Limit	Contact Discharge +/- 4 kV; Air Discharge +/- 8 kV
Result	A: The monitored function operates as designed during and after exposure to a disturbance.

Kind	**Electromagnetic Field Immunity Test**
According	DIN EN 61000-4-3:2006-12
Ceck accuracy / Limit	10 V/m; 80 - 1000 MHz; AM; m = 0,8; f = 1 kHz; 1%; t = 3 s
Result	A: The monitored function operates as designed during and after exposure to a disturbance.

Kind	**Electrical Fast Transient / Burst Immunity Test**
According	DIN EN 61000-4-4:2005-07
Ceck accuracy / Limit	+/- 2 kV on Power Lines; Coupling: POS, NEG, {PE}, ALL, 5 kHz and 100 kHz; 1 min
Result	A: The monitored function operates as designed during and after exposure to a disturbance.

Kind	**Immunity to Conducted Disturbances, Induced by RF-Fields**
According	DIN EN 61000-4-6:2001-12
Ceck accuracy / Limit	10 Vrms; 150 kHz - 80 MHz; m = 0,8; f = 1 kHz; 1%; t = 3 s
Result	A: The monitored function operates as designed during and after exposure to a disturbance.

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

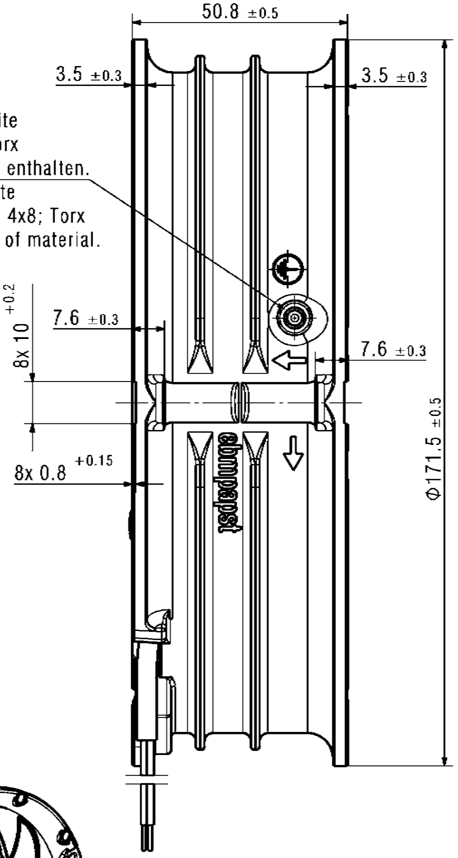
CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans E38324
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Canadian Standards Association	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.: 65 ℃

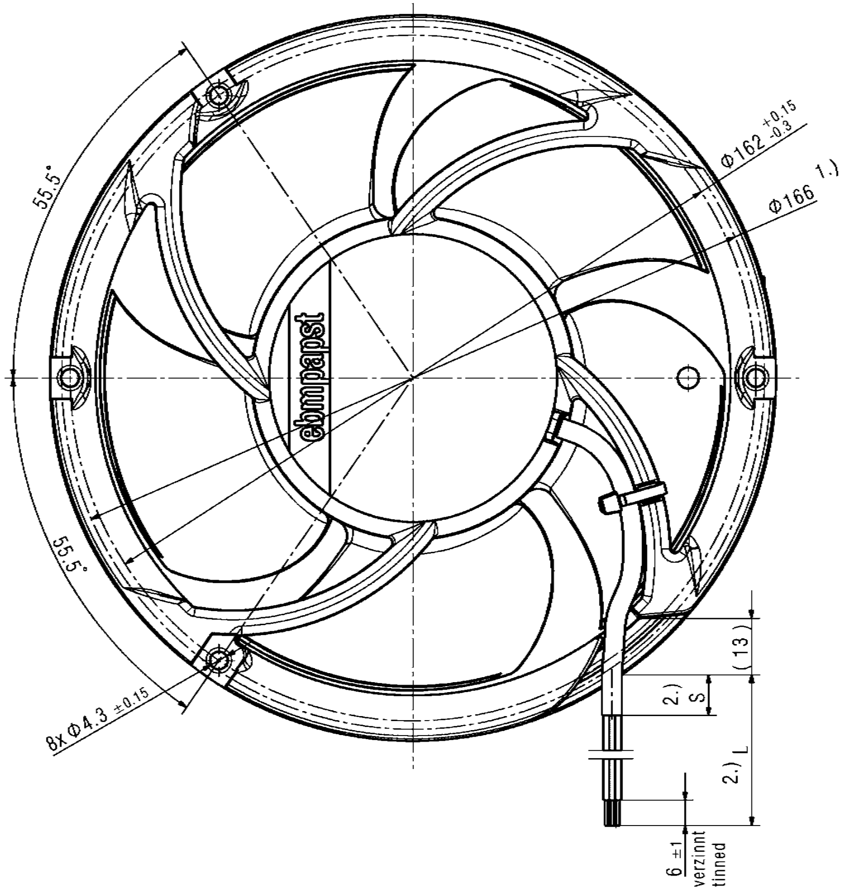
6 Reliability

6.1 General

Life expectancy L10 at TU = 40 ℃	62.500 h	
Life expectancy L10 at TU max.	35.000 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 ℃	105. 000 h	



Erdungsschraube Duo-Taptite nach DIN 7500; CM 4x8; Torx nur wenn in Unterstückliste enthalten.
Grounding screw Duo-Taptite according to DIN 7500; CM 4x8; Torx only if contained in subbill of material.



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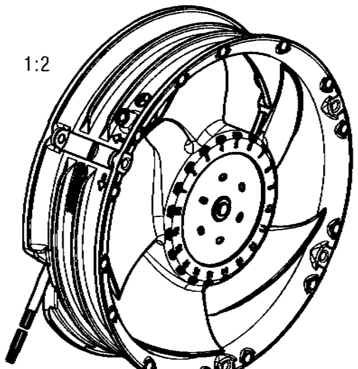

- Axialspiel der Kugellager mit Feder spielfrei verspannt.
1.) Maße für Montageausschnitt
2.) Anzahl und Länge der Litzen und des Schlauchs siehe Produktspezifikation.

- 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.

Dokument-Status / Document-State
CATIA-Version/ CATIA-Version
CAD-Umgebung/ CAD-Environment
9295420052 CPA000-
Aend.-Nr./ Change-No.
3D-Referenzmodell / 3D-Referencemodel
Tolerierung / Tolerances:
Allgemeintoleranzen / Gen. Tolerances:
Datum
Name
Bearb./ Drawn
Gepr./ Checked
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Werkstoff / Material:
Volumen / Volume (mm^3):
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Artikel / Title:
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