Product Data Sheet 6314/2TDHHP-015

ebmpapst

The engineer's choice



GREEN TECH

6314/2TDHHP-015

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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

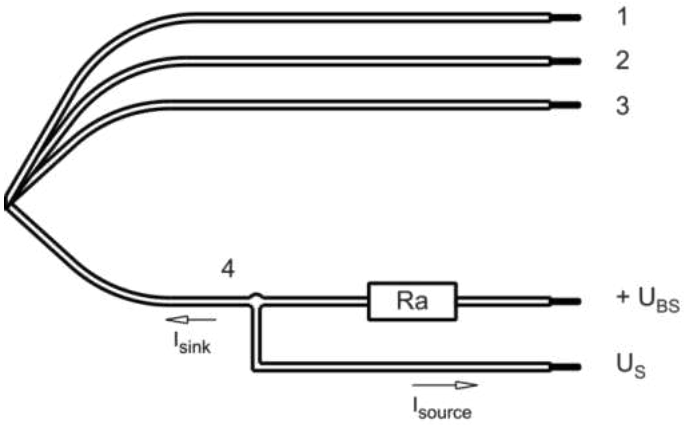
2.1 General

Width	160,0 mm	
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 size (AWG)	18 22	
Insulation diameter	1,7 mm 2,2 mm	





Wire	Color	Operation
1	red	+ UB
2	blue	- GND
3	violet	PWM
4	white	Tacho

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

3 Operating Data

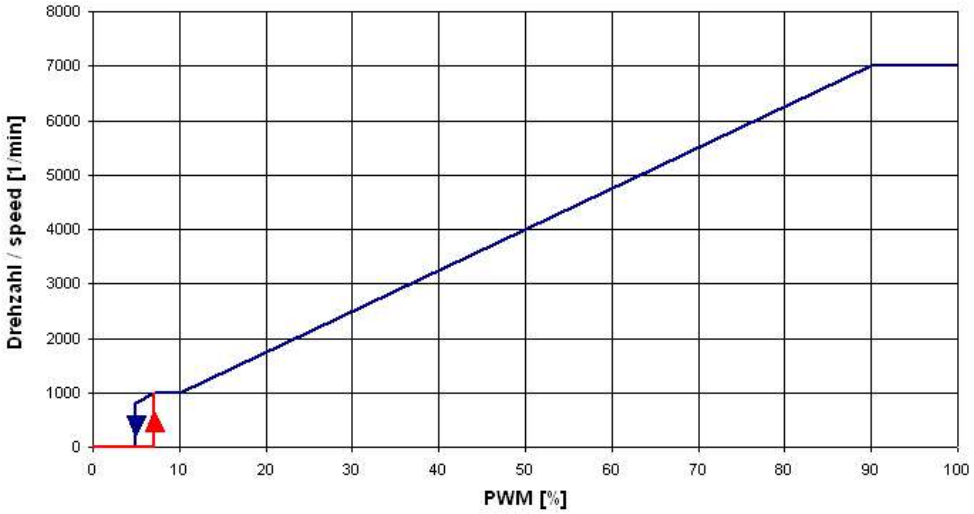
3.1 Electrical Interface - Input

Control input	PWM

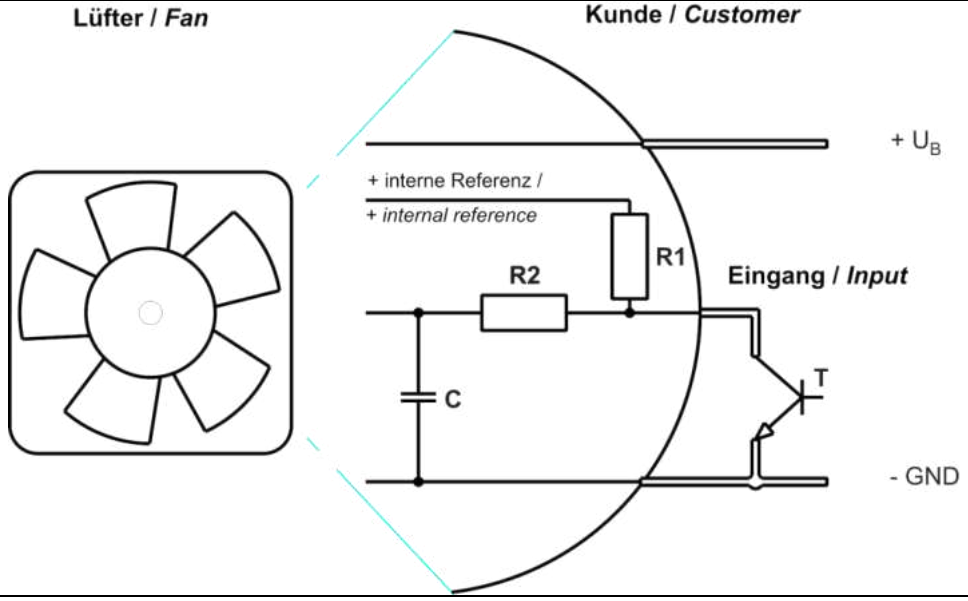
Features

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

Characteristics



Schematics



The shown pull-up resistor 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°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.

Δp = 0: corresp. to free air flow (see chapter aerodynamics)
I: corresp. to arithm. mean current value

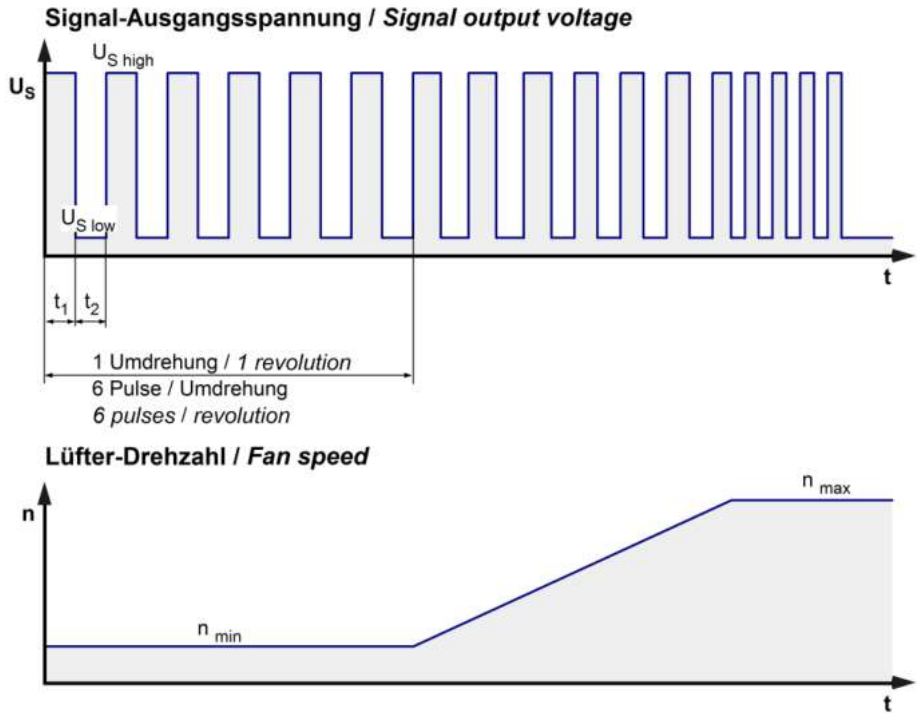
Name	Condition		
PWM 0001	PWM: 95 %; f: 2 kHz		

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

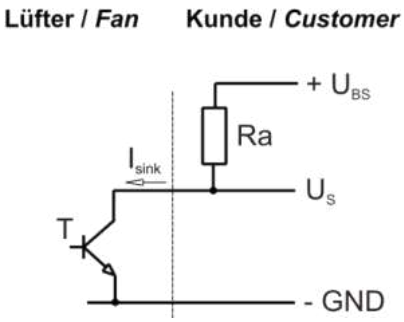
Features	Condition	Symbol	Values		
Voltage range		U	16 V		36 V
Nominal voltage		U_N		24 V	
Power consumption Tolerance	Δp = 0 PWM 0010	P	37 W +- 10 %	67 W +- 10 %	67,0 W +- 10 %
Current consumption Tolerance	Δp = 0 PWM 0010	I	2.300 mA +- 10 %	2.800 mA +- 10 %	1.850 mA +- 10 %
Speed Tolerance	Δp = 0 PWM 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)



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



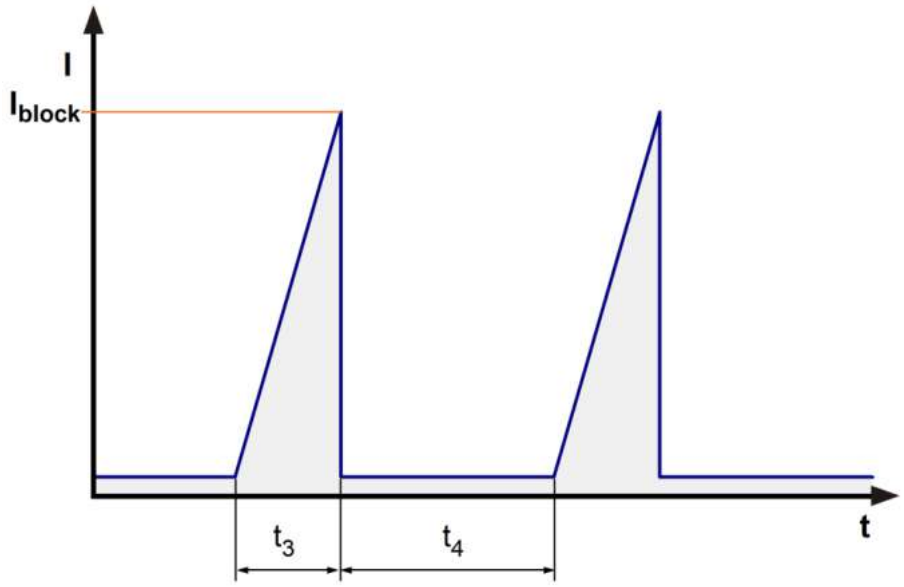
Features		Note	Values
Tacho operating voltage	U_{BS}		<= 60,0 V
Tacho signal Low	$U_{S\,low}$	I sink: 2 mA	<= 0,4 V
Tacho signal High	$U_{S\,high}$	I source: 0 mA	60,0 V
Maximum sink current	I_{sink}		<= 20 mA
External resistor		External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency		(6 x n) / 60	
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.

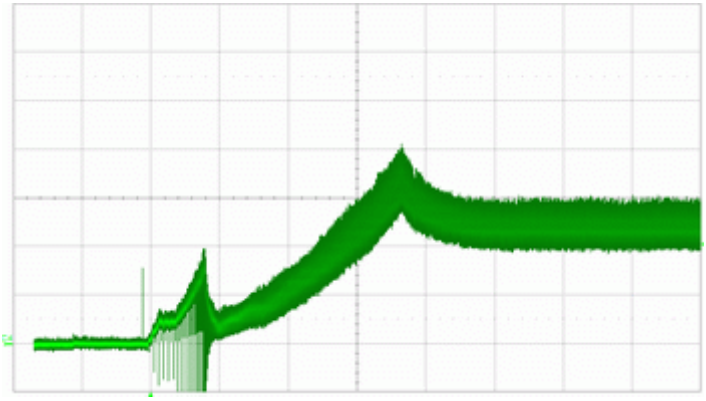
3.4 Electrical Features

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	t_3 / t_4 typical: 3 s / 10,0 s	

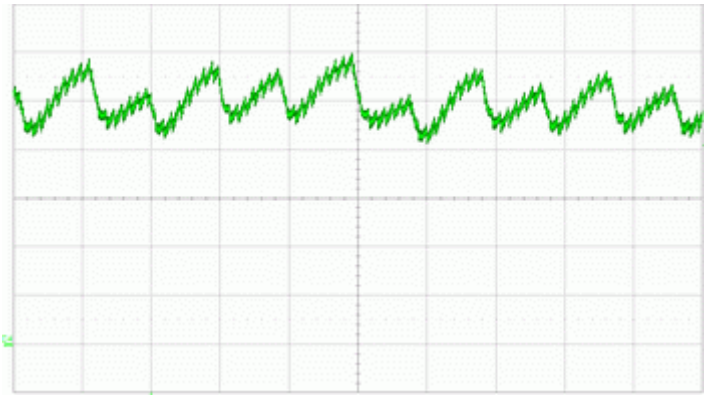


First locked rotor off time is reduced to 3 seconds.
Afer 4 unsuccessfull start up trys the fan will be turned off for 40 seconds. .

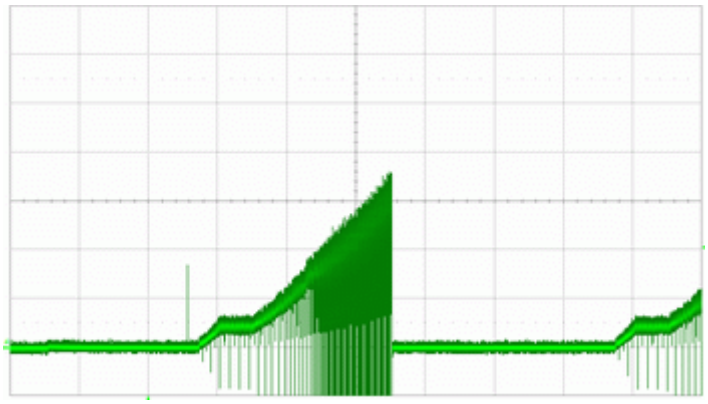
This fan has a startup delay of 2 seconds after applying supply voltage.



Start-up current @ 24 V (I = 1A/div ; t = 2s/div)



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



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

Internal Fuse:

Littelfuse Nano2 Fuse
Very Fast-Acting 451/453 Series
12A / 65V

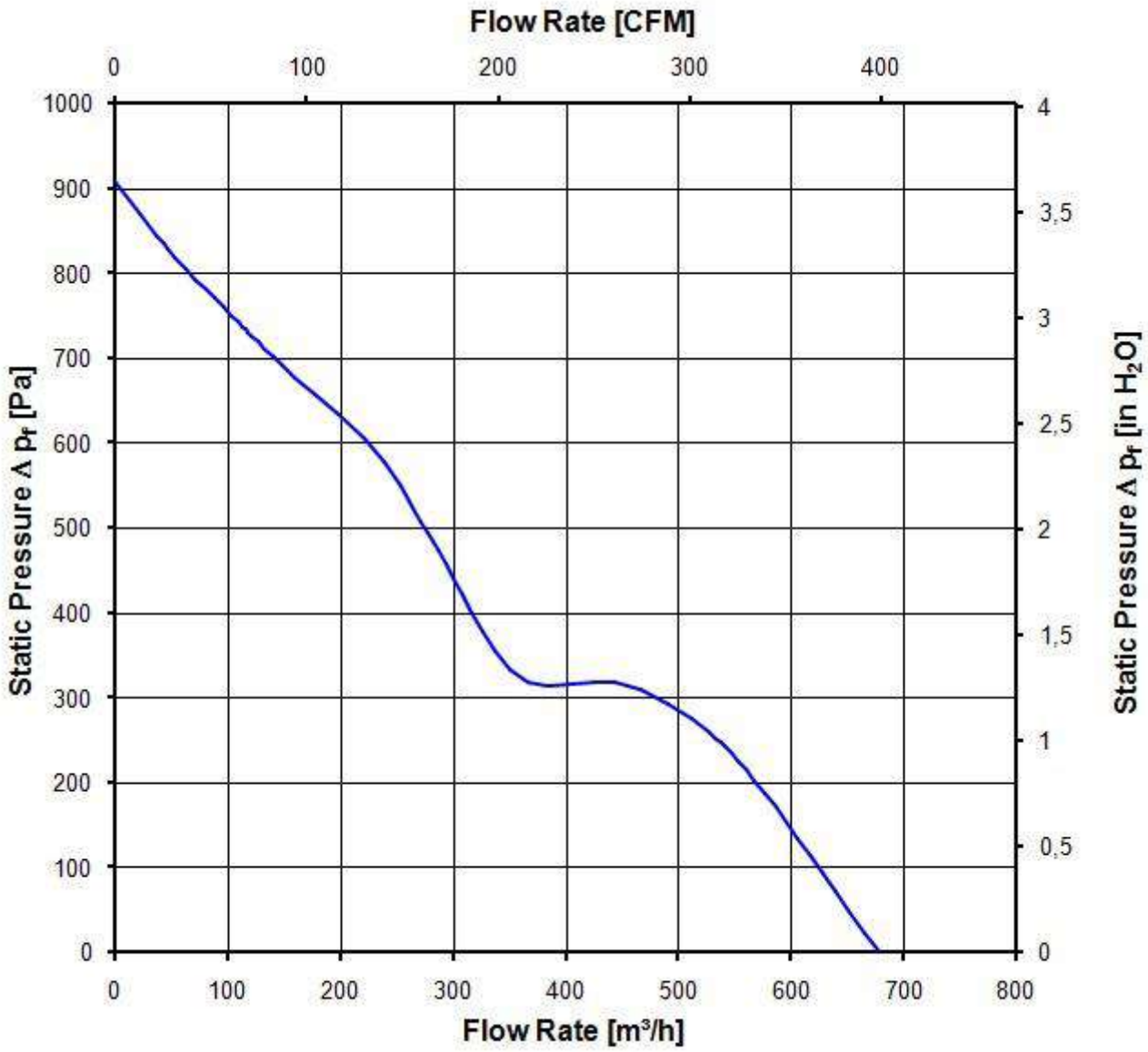
3.5 Aerodynamics

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.

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.)	680,0 m3/h	
Max. static pressure (Δp = max. / $\dot{V}$ =0)	910 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	670,0 m3/h @ 20 Pa	
Sound power level at the optimal operating point	7,9 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	69,0 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°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. 500 VAC / 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

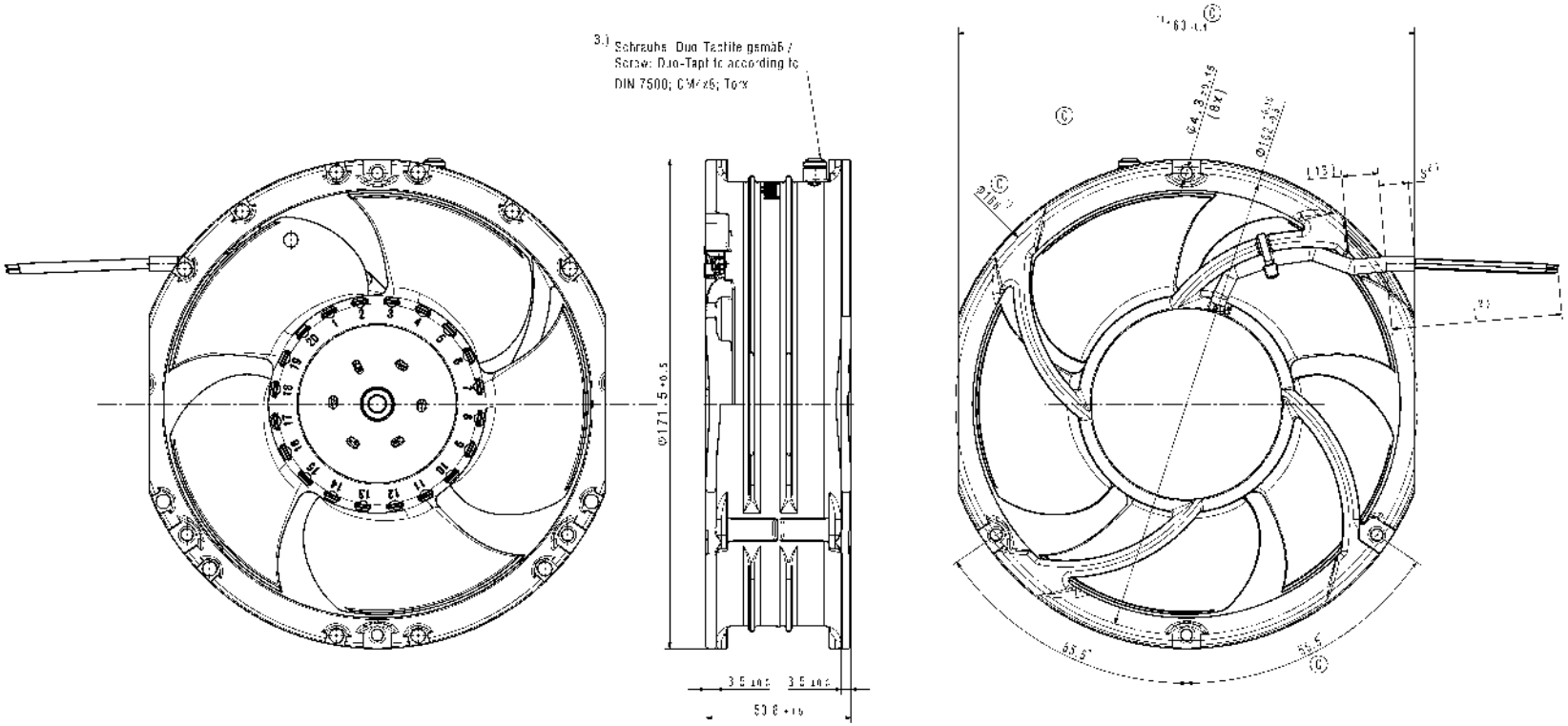
CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Canadian Standards Association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

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

6 Reliability

6.1 General

Life expectancy L10 at TU = 40 °C	62.500 h	
Life expectancy L10 at TU max.	30.000 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	105.000 h	



Ⓒ

1.) Maße für Montageausschnitt. / Dimensions for assembly wall.
2.) Anzahl und Länge von Litzen u. Sch auch siehe Produktspezifikation /
Length an number of wires and fuse see product specification.
3.) Nur wenn in Stückl ste enthalten. / Only if is included in bill of material.
- Axialspiel der Kugellager m t Federsp e frei verspannt. /
Ball bearing without clearance by a preload spring.

Zeichnung entspricht 3D-Modell:
Drawing is equivalent to 3D-Model:
9295420007_CPR_Q3C_-

System: CATIA V5 R 19

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