Product Data Sheet 6448/2TDHHP

ebmpapst

The engineer's choice



GREEN TECH

6448/2TDHHP

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6.1 General 11

1 General

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

2 Mechanics

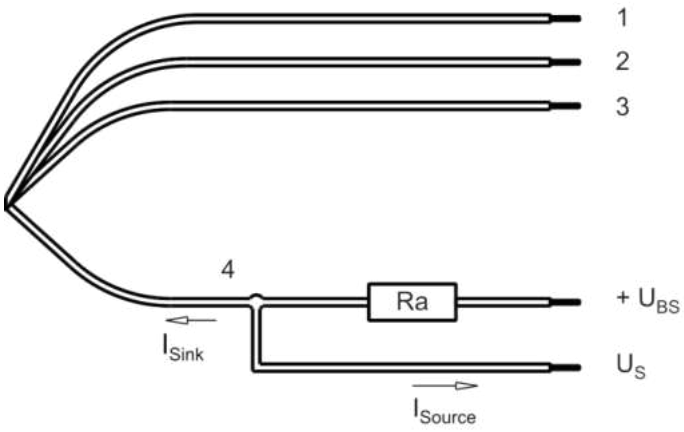
2.1 General

Width	150,0 mm	
Depth	51,0 mm	
Diameter	172,0 mm	
Mass	0,780 kg	
Housing material	Metal	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges Screw size	wire outlet corner: 260 Ncm remaining corners: 260 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 = 15 mm +- 5,0 mm	
Wire size (AWG)	22	
Insulation diameter	1,70 mm	
Contact	See drawing	





Wire	Colour	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.

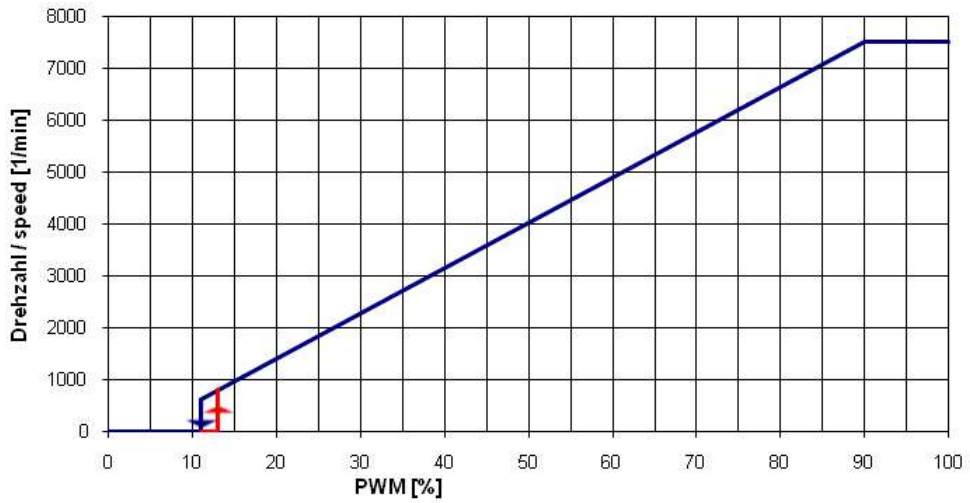
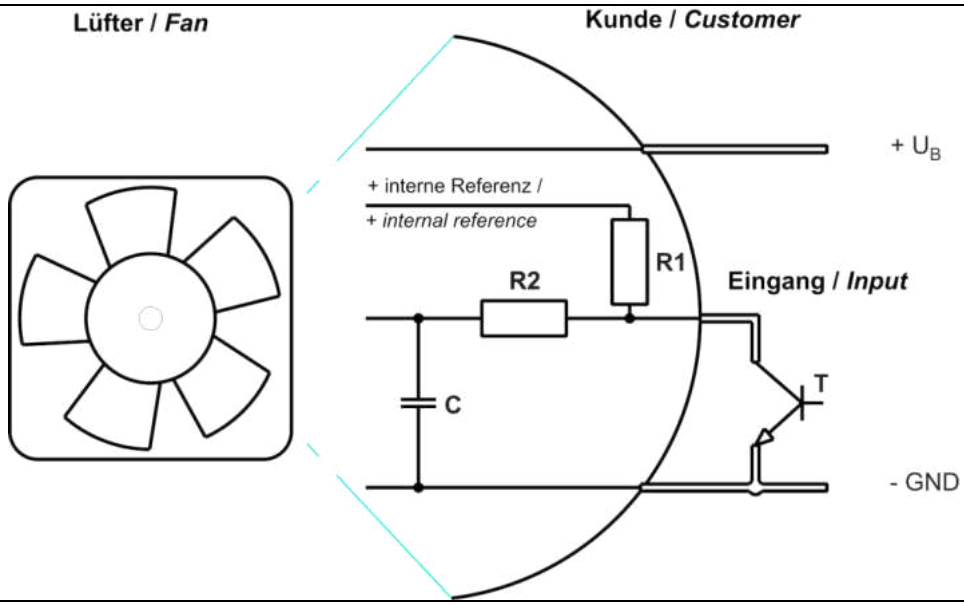
3 Operating Data

3.1 Operating Data - Electrical Interface - Input

Control input	PWM

Features

Inpute type	Open collector	
PWM - Frequency		Typical: 2 kHz

Characteristics	
Schematics	

Speed control:
By Puls width modulation (PWM) 0 ... 100%
Open collector in relation to signal-ground
f = 2kHz +-20%

Information to the curve:

0% - <=12% PWM:	0 1/min
13% - 90% PWM:	linear increasing curve
90% - 100% PWM:	7.500 1/min (corresponding to max. speed)
13% PWM:	800 1/min (Fan on, comming from 0% PWM)
11% PWM:	600 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 section 3.5)
I: corresp. to arithm. mean current value

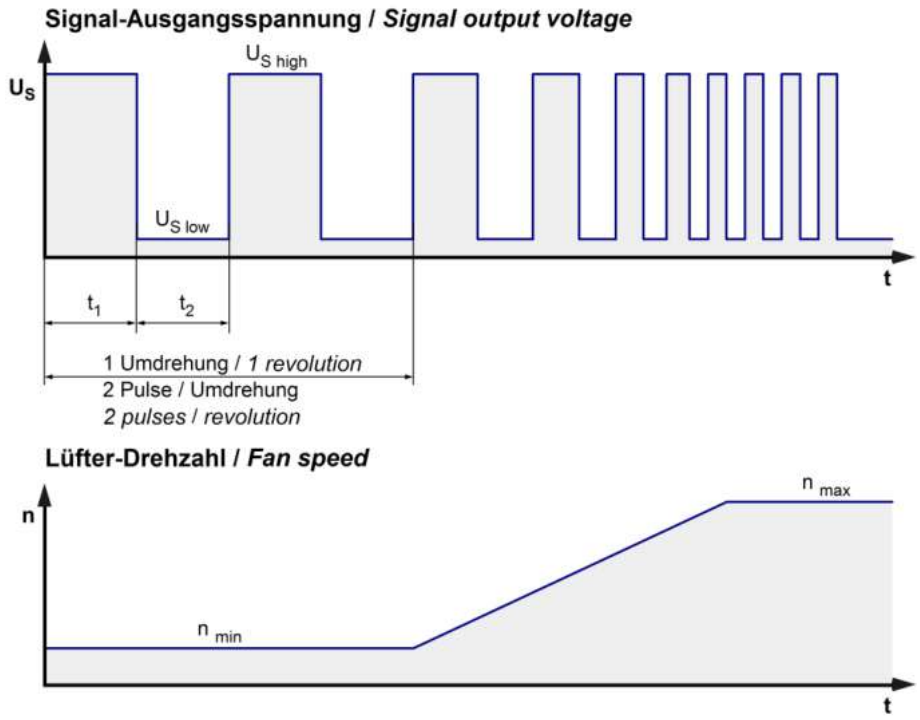
Name	Condition		
PWM 0001	PWM: 100 %;		

Remark: inrush current @ U nom:
The internal electrolytic capacitor 220uF/75V has inrush current limitation, the existing peak depends on ceramic capacitor 100nF.

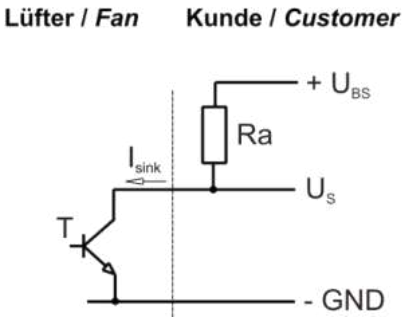
Features	Condition	Symbol	Values		
Voltage range		U	36 V		72 V
Nominal voltage		U_N		48 V	
Power consumption Tolerance	$\Delta p = 0$ PWM 0010	P	162 W +- 15 %	160 W +- 15 %	169,2 W +- 15 %
Current consumption Tolerance	$\Delta p = 0$ PWM 0010	I	4.500 mA +- 15 %	3.300 mA +- 15 %	2.350 mA +- 15 %
Speed Tolerance	$\Delta p = 0$ PWM 0010	n	7.500 1/min +- 10 %	7.500 1/min +- 10 %	7.500 1/min +- 10 %

3.3 Operating Data - Electrical Interface - Output

Tacho type	/2 (open collector)



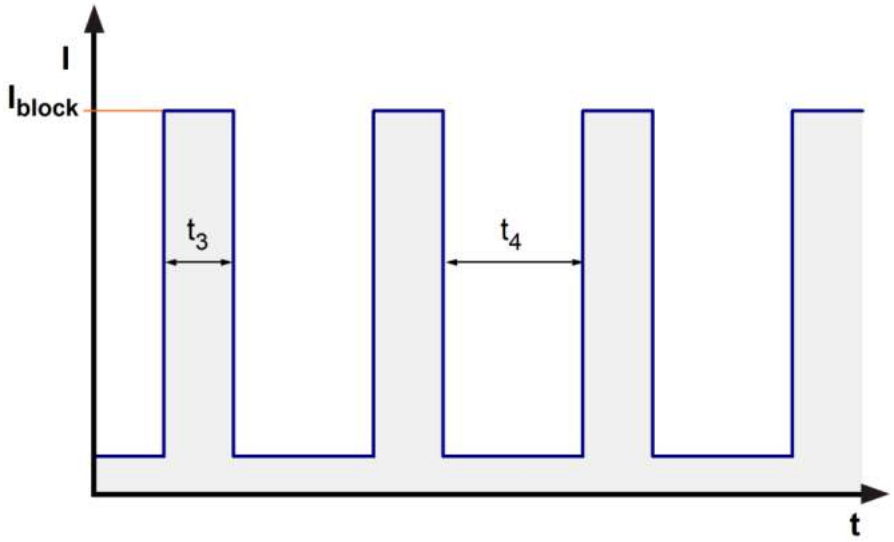
$$Ra = \frac{U_{BS} - U_{S\,low}}{I_{sink}}$$



Features	Note	Values
Tacho operating voltage (UBS)		<= 60 V
Tacho signal Low	I sink: 2 mA	<= 0,4 V
Tacho signal High	I source: 0 mA	
Maximum sink current		<= 20 mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency	(2 x n) / 60	
Tacho isolated from motor	No	
Slew rate		=> 0,5 V/us

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at U_N	P-CH FET I_F <= 20	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block}	
Clock signal at locked rotor	t_3 / t_4 Typical: 0,5 s / 10,0 s	



Internal Fuse:
Littlefuse NANO2(R) FUSE; Very fast acting 451 Series; 7 A (Art.-Nr.: 451007)

3.5 Data According ErP Directive

Installation / Efficency category	A / static
Speed control	integrated
Specific ratio	1,00398
Target overall efficiency 2015	29,2 %
Overall efficiency	37,5 %
Efficiency grade	40
Power input	198,7 W
Speed	7.480 1/min

All values measured in optimum energy efficiency point.

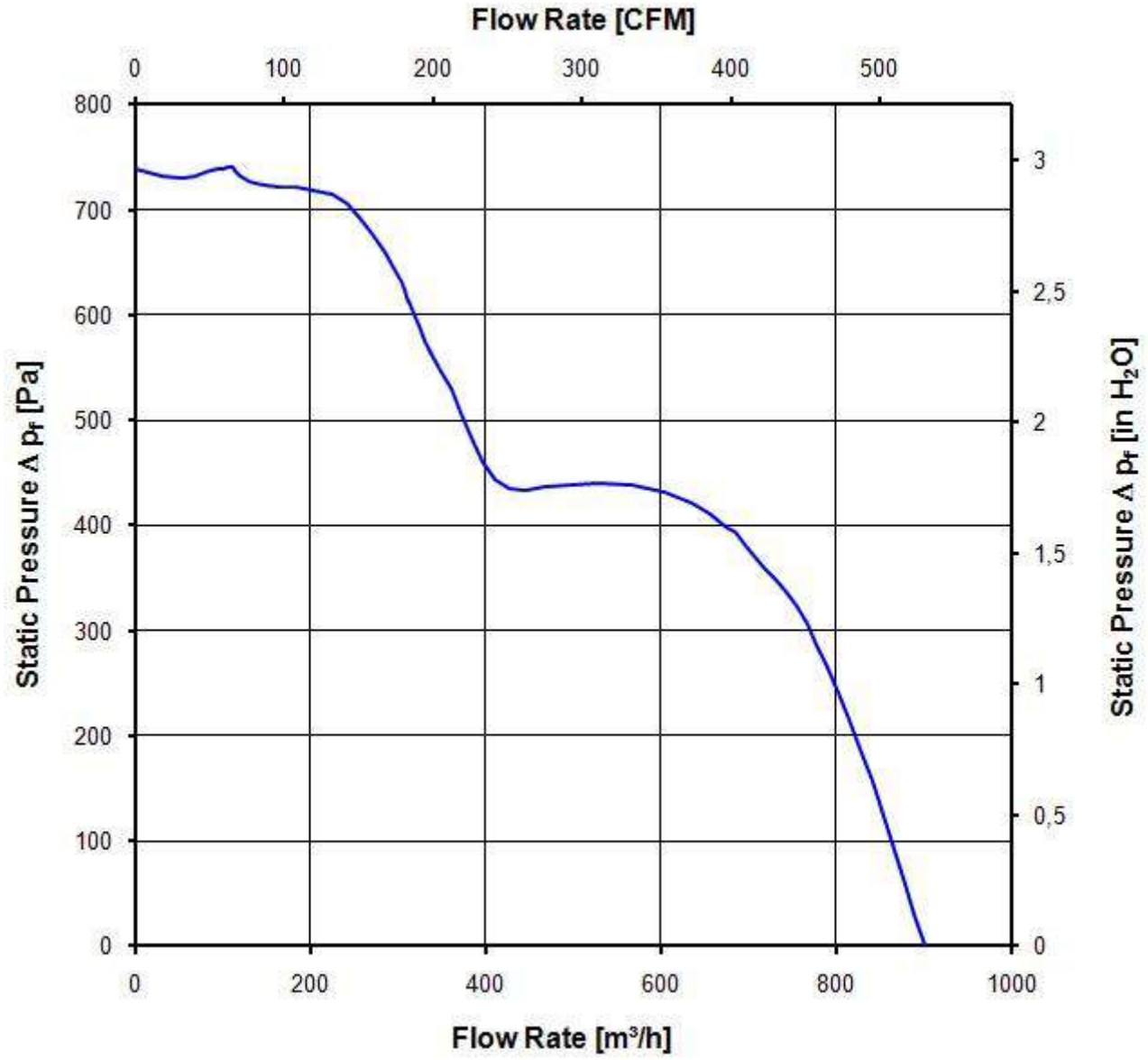
3.6 Aerodynamics

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. 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:

7.500 1/min at free air flow	PWM 100 %;		

Max. free-air flow (Δp = 0 / V̇ = max.)	900,0 m3/h	
Max. static pressure (Δp = max. / V̇ =0)	740 Pa	



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 semianchoic chamber with a background noise level of Lp(A) < 5 dB(A) For further measurement conditions see section 3.5

a.) Operation condition:

7.500 1/min at free air flow	PWM 100 %	PWM min.:	PWM max.:

Optimal operating point	655,0 m3/h @ 362 Pa	
Sound power level at the optimal operating point	8,7 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	80,0 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	

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	

*) Permittet 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.

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

5.2 Approval Tests

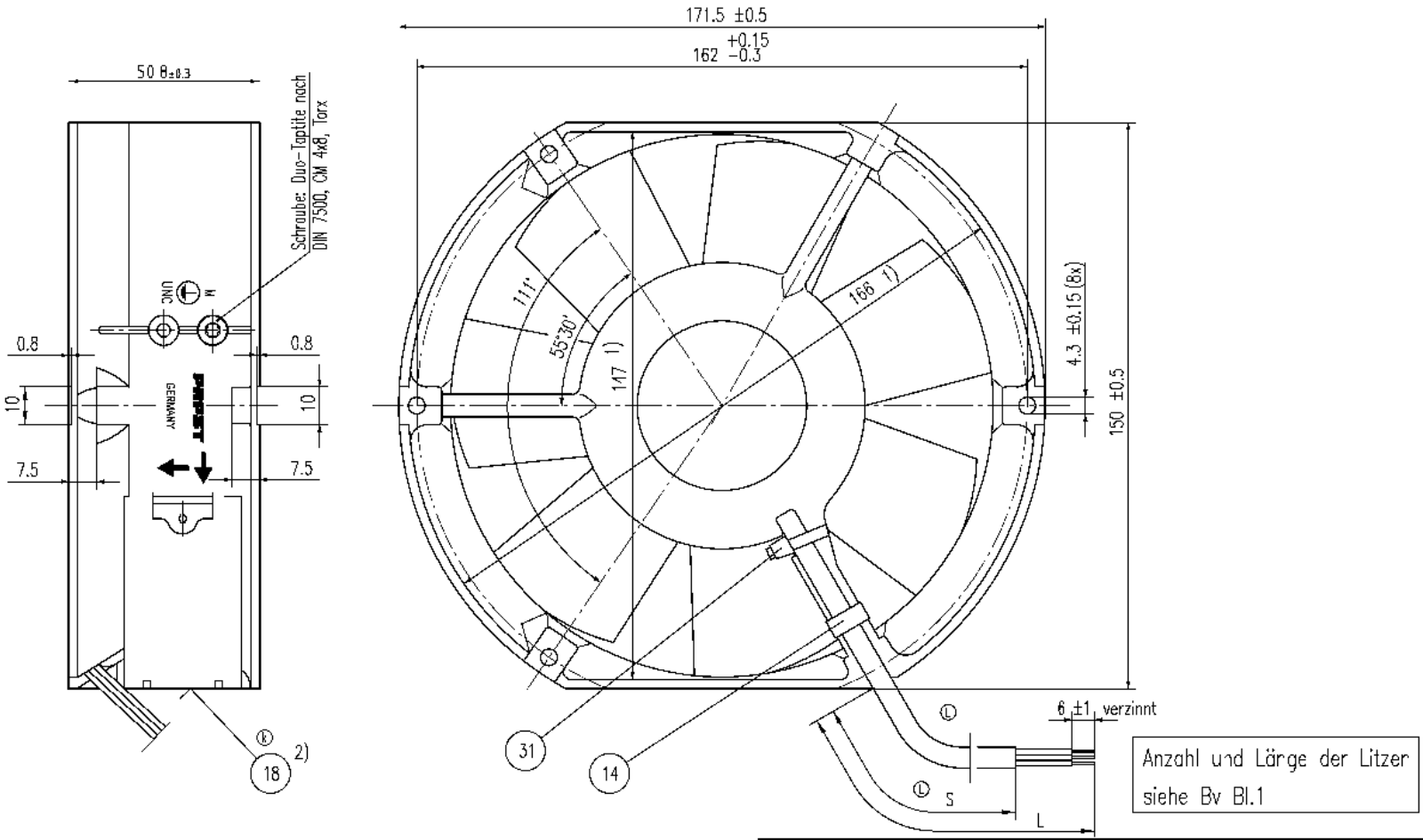
CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Canadian Standards Association	Yes / C22.2 No. 113 Fans and Ventilators
CCC	China Compulsory Certification	Yes / GB 12350 Safety Requirements for small Power Motors

The approval tests are observed to:
U approval max.:72,0 V @ TU approval max.: 65,0 °C

6 Reliability

6.1 General

Life expectancy L10 at TU = 40 °C	70.000 h	
Life expectancy L10 at TU max.	45.000 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	117.500 h	



Anzahl und Länge der Litzen siehe Bv Bl.1

1) Maße für Montagewand
2) nur wenn in Stückliste enthalten

Axialspiel: mit Feder spielfrei verspannt

Toleranzierung: DIN 7167 Allgemeintoleranzen: DIN ISO 2768-mK				
	Datum	Name	PAPST PAPST-MOTOREN GmbH & Co KG D-78112 St.Georgen Germany	Artikel	Maßstab
Bearbeitet					
	Index	Änd.-Nr.		Zchg. Nr.	Blatt
Geprüft u. zur Verwendung freigegeben von		am		Erst.Zchg:	A3