



The engineer's choice

ebmpapst

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1 General

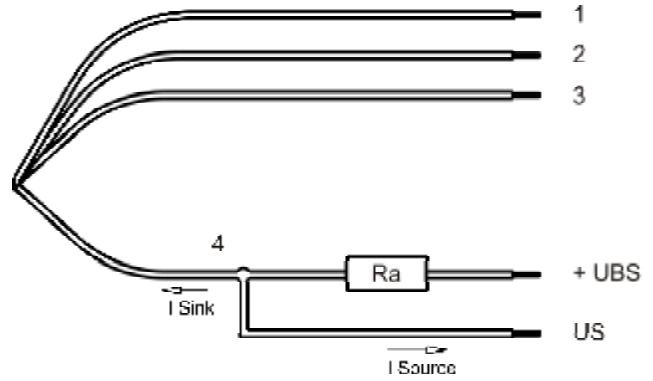
Fan type	Fan	
Rotational direction looking at rotor	counterclockwise	
Airflow direction	Air outlet over struts	
Bearing system	Ball bearing	
Mounting position	any	

2 Mechanics**2.1 General**

Width	40,0 mm	
Height	40,0 mm	
Depth	28,0 mm	
Weight	0,044 kg	
Housing material	Plastic	
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires	
Length of lead wire	310 mm	
Tolerance	+ - 10,0 mm	
Wire gauge (AWG)	28	
Insulation diameter	0,9 mm	
Contact	see drawing	



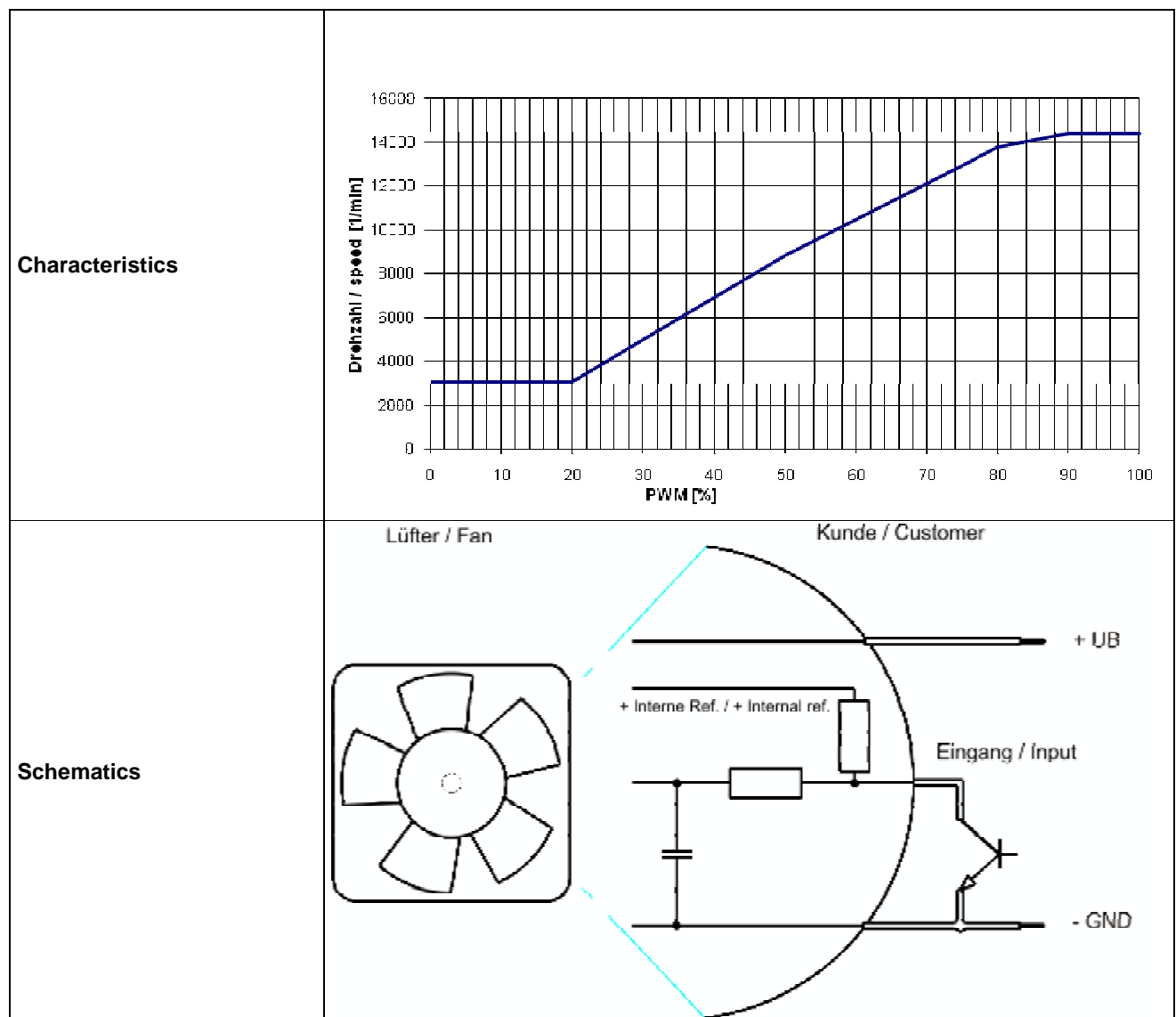
	Colour	Operation
Wire 1	red	+ UB
Wire 2	blue	- GND
Wire 3	violet	PWM
Wire 4	white	Tacho

The auxiliaries 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
Inpute type	Open collector	
PWM - Frequency		1 kHz - 30 kHz Typical: 25 kHz
Max. voltage for logic "Low"		0,2 V
Maximum source current	short circuit current	≤ 1 mA



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 %; f: 25 kHz

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	8,0 V		13,8 V
Nominal voltage	$\Delta p = 0$	U_N		12,0 V	
Power consumption	$\Delta p = 0$	P	3,4 W +- 17,5 %	7,9 W +- 12,5 %	10,5 W +- 15 %
Tolerance	PWM 0001				
Current consumption	$\Delta p = 0$	I	420 mA +- 17,5 %	660 mA +- 12,5 %	760 mA +- 15 %
Tolerance	PWM 0001				
Speed	$\Delta p = 0$	n	10.750 1/min +- 12,5 %	14.400 1/min +- 7,5 %	15.250 1/min +- 10 %
Tolerance	PWM 0001				
Starting current consumption				1.000 mA	

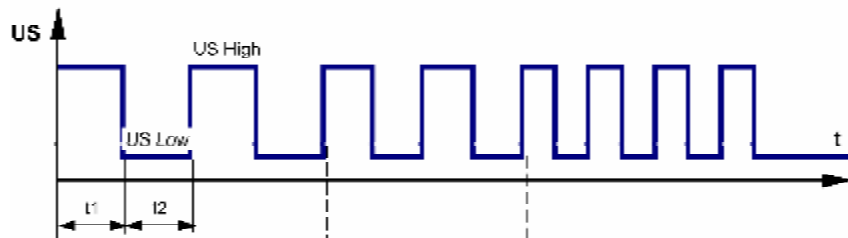
Name	Condition
PWM 0002	PWM: 50 %; f: 25 kHz

Features	Condition	Symbol	Values
Voltage range	$\Delta p = 0$	U	13,8 V
Nominal voltage	$\Delta p = 0$	U_N	12,0 V
Power consumption	$\Delta p = 0$	P	2,2 W +- 15,0 %
Tolerance	PWM 0002		
Current consumption	$\Delta p = 0$	I	180 mA +- 15 %
Tolerance	PWM 0002		
Speed	$\Delta p = 0$	n	8.850 1/min +- 10 %
Tolerance	PWM 0002		

3.3 Operating Data - Electrical Interface -Output

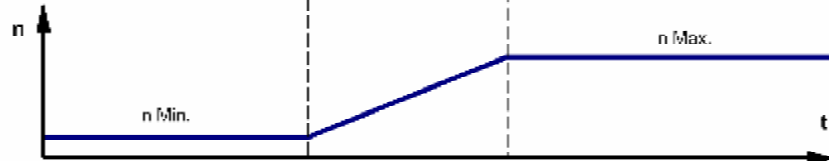
Tacho type	/2 (Open collector)
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Signal-Ausgangsspannung / Signal output voltage



$$R_a = \frac{U_{BS} - U_{S \text{ Low}}}{I_{\text{Sink}}}$$

Lüfter-Drehzahl / Fan speed

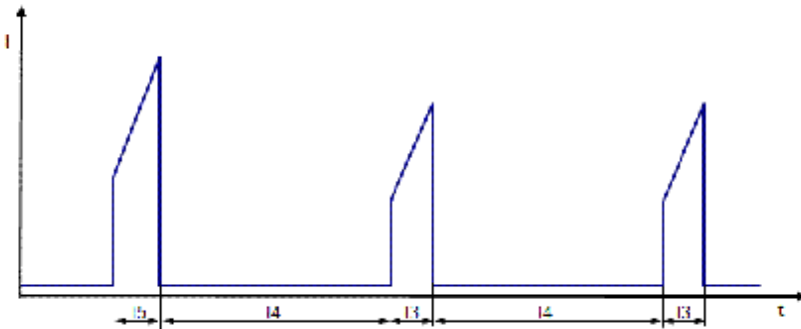


Features	Note	Values
Tacho operating voltage (UBS)		$\leq 15 \text{ V}$
Tacho signal Low	I sink: 2 mA	$\leq 0,4 \text{ V}$
Tacho signal High	I source: 0 mA	15 V
Maximum sink current		$\leq 4 \text{ mA}$
External resistor	External resistor R_a from UBS to US required. All voltages measured to GND.	
Tacho frequency	$(2 \times n) / 60$	480 Hz
Tacho isolated from motor	No	
Slew rate		$\Rightarrow 0,5 \text{ V/us}$

Alarm type	None
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3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection	Rectifying diode	
Max. residual current at U_n	$I_F \leq 5 \text{ mA}$	
Locked rotor protection	Auto restart	
Locked rotor current at U_n	approx. 1.000 mA	
Clock signal t_3/t_4 at locked rotor	Typical: 0,45 s / 4,5 s t_3 : 0,25 s... 0,75 s t_4 : 2,5 s... 7,5 s	



First pulse t_5 typical 0.7s (0.5 .. 1.0s) followed by t_4 .
Afterwards cyclical t_3/t_4 .

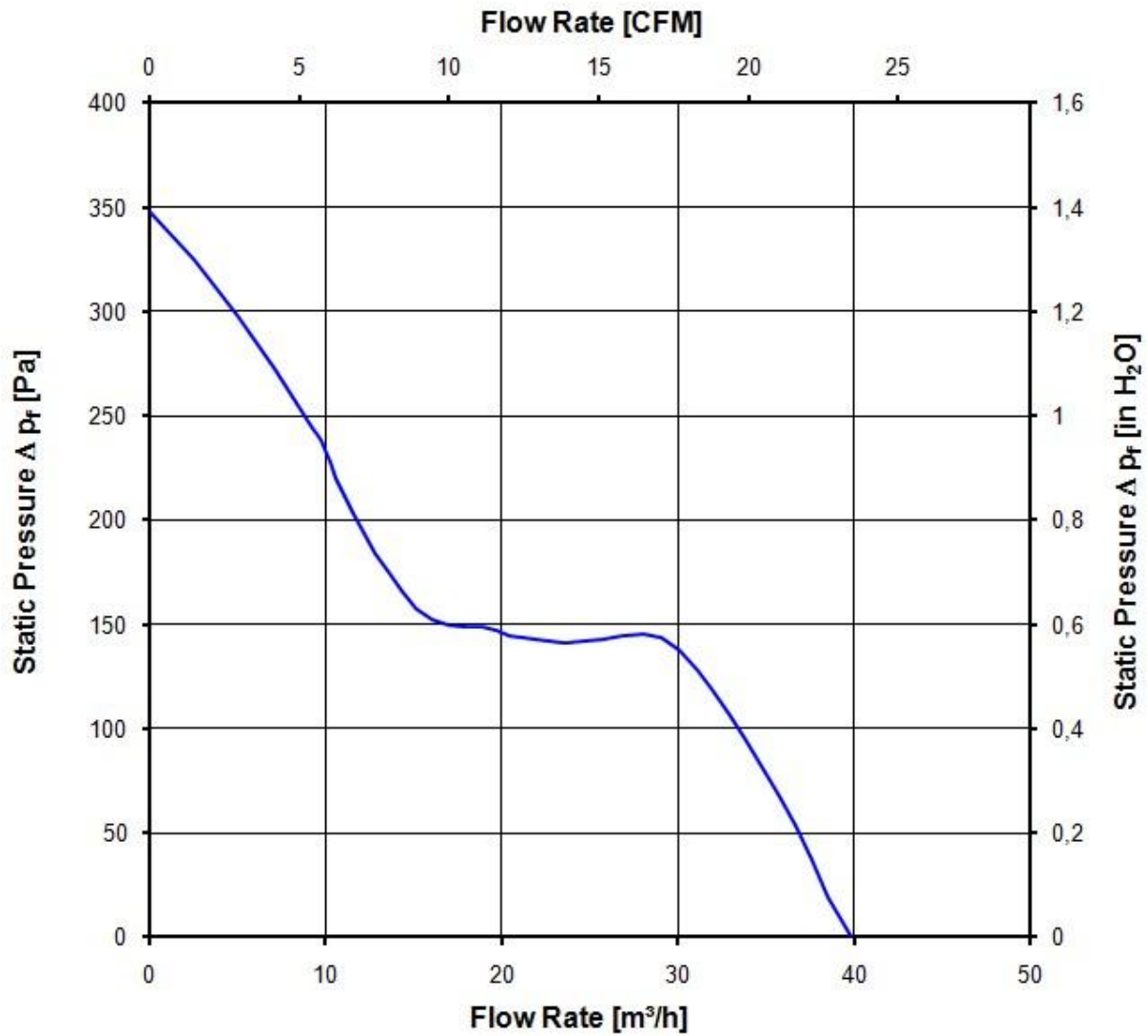
3.5 Aerodynamic

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.

a.) Operation condition:

14.400 1/min at free air flow	PWM 100 %; f: 25 kHz	
14.400 1/min at free air flow		

Max. free-air flow ($\Delta p = 0 / \dot{V} = \text{max.}$)	40,0 m ³ /h	
Max. static pressure ($\Delta p = \text{max.} / \dot{V} = 0$)	350 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 $L_p(A) < 5 \text{ dB(A)}$
 For further measurement conditions see section 3.5

a.) Operation condition:

14.400 1/min at free air flow	PWM 100 %; f: 25 kHz	PWM min.:	PWM max.:
14.400 1/min at free air flow			

Optimal operating point	30,0 m ³ /h @ 121 Pa	
Sound power level at the optimal operating point	6,9 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	58,0 dB(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	70 °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	
Radiation exposure	None	
Dust requirements	None	
Salt fog requirements	None	
Harmful gas 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.**Mechanical requirements**

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.	Not applicable Not applicable	
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	
Air and leakage distances	0,5 mm / 1,2 mm	
Protection class	III	

for functional security Test at 200 VAC / 1sec

5.2 Approval Tests

CE	No
UL	No
VDE	No
CSA	No
CCC	No

The approval tests are observed to:

Maximal permitted operating voltage (see section 3.1) and max. permitted ambient temperature TU max.

6 Reliability

6.1 General

Life expectancy L10 at TU = 40 °C	60.000 h	
Life expectancy L10 at TU max.	30.000 h	
Life expectancy L10 Delta (40 °C)	120.000 h	