

Product Data Sheet 3214 J/2H4PU

ebmpapst

The engineer's choice



3214 J/2H4PU

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1 General

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

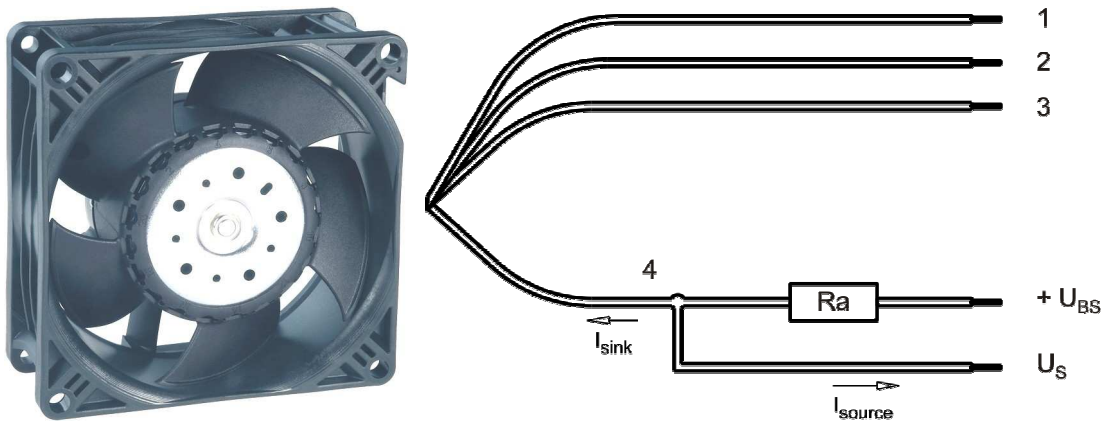
2 Mechanics

2.1 General

Width	92,0 mm	
Height	92,0 mm	
Depth	38,0 mm	
Mass	0,280 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	Wire outlet corner: 30 Ncm Remaining corners: 30 Ncm	
Screw size	ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

Electrical connection	Wires	
Lead wire length	L = 310 mm	
Tolerance	+ - 10,0 mm	



Wire	Color	Operation	Wire size	Insulation diameter
1	red	+ UB	AWG 22	1,30 mm
2	blue	- GND	AWG 22	1,30 mm
3	violet	PWM	AWG 22	1,30 mm
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 Electrical Interface - Input

Control input	PWM
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Features

Input type	Open collector	
PWM - Frequency		1 kHz - 5 kHz

Characteristics	<table border="1" style="margin: 10px auto;"> <caption>Approximate data from Characteristics graph</caption> <thead> <tr> <th>PWM [%]</th> <th>Speed [1/min]</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td></tr> <tr><td>5</td><td>2000</td></tr> <tr><td>10</td><td>2000</td></tr> <tr><td>20</td><td>3000</td></tr> <tr><td>30</td><td>4000</td></tr> <tr><td>40</td><td>5000</td></tr> <tr><td>50</td><td>6000</td></tr> <tr><td>60</td><td>7000</td></tr> <tr><td>70</td><td>8000</td></tr> <tr><td>80</td><td>9000</td></tr> <tr><td>90</td><td>13000</td></tr> <tr><td>100</td><td>13000</td></tr> </tbody> </table>	PWM [%]	Speed [1/min]	0	0	5	2000	10	2000	20	3000	30	4000	40	5000	50	6000	60	7000	70	8000	80	9000	90	13000	100	13000
PWM [%]	Speed [1/min]																										
0	0																										
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70	8000																										
80	9000																										
90	13000																										
100	13000																										
Schematics	<p>The schematic shows a fan (Lüfter / Fan) connected to a customer's control circuit (Kunde / Customer). The fan's input is connected to the emitter of a transistor (T). The base of the transistor is connected to the customer's input (Eingang / Input) through a resistor (R2). The collector of the transistor is connected to the positive supply rail (+ UB) through a resistor (R1). A capacitor (C) is connected between the base and emitter. The negative supply rail is labeled - GND. An internal reference (+ interne Referenz / + internal reference) is also shown connected to the base of the transistor.</p>																										

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)

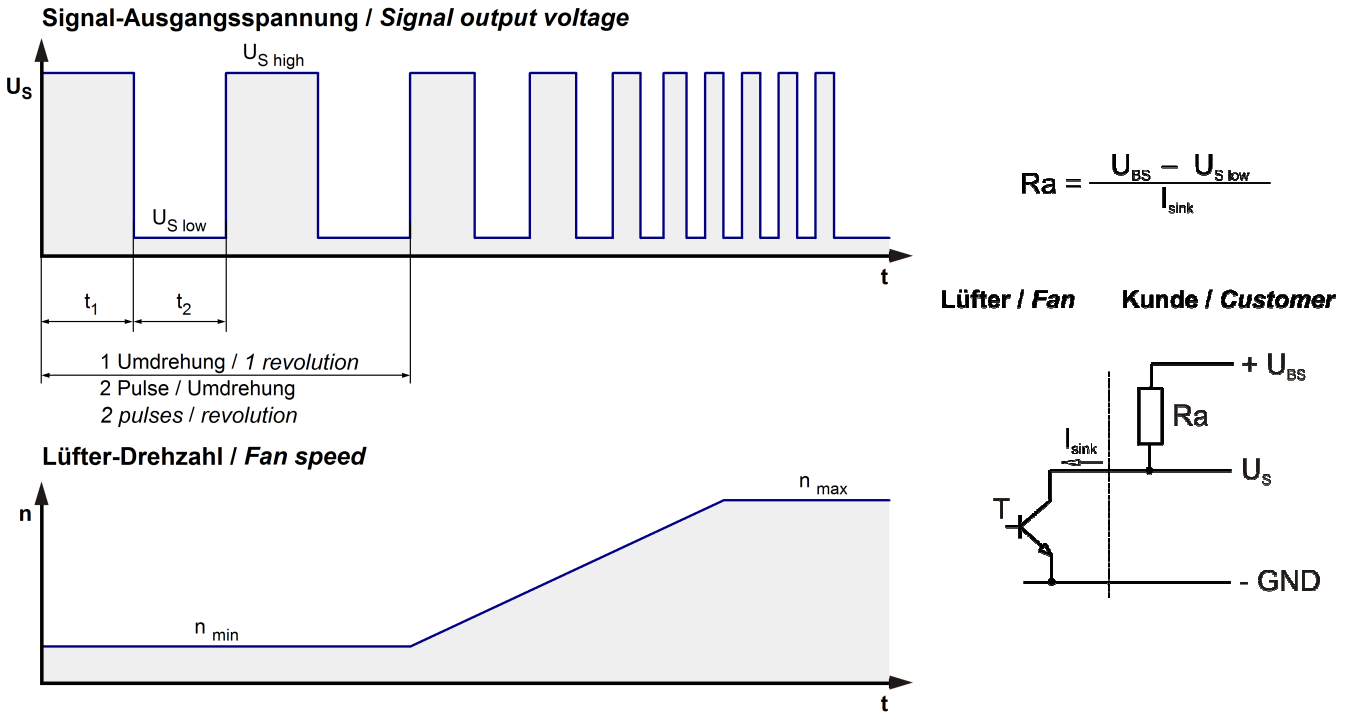
I: corresp. to arithm. mean current value

Name	Condition		
PWM 0001	PWM: 100 %;	f: 1 kHz	f: 5 kHz

Features	Condition	Symbol	Values		
Voltage range		U	12 V		27,6 V
Nominal voltage		U_N		24 V	
Power consumption	$\Delta p = 0$		12 W	50 W	50 W
Tolerance	PWM 0010	P	+/- 17,5 %	+/- 17,5 %	+/- 25 %
Current consumption	$\Delta p = 0$		1.000 mA	2.100 mA	1.800 mA
Tolerance	PWM 0010	I	+/- 17,5 %	+/- 17,5 %	+/- 25 %
Speed	$\Delta p = 0$		7.800 1/min	13.000 1/min	13.000 1/min
Tolerance	PWM 0010	n	+/- 12,5 %	+/- 7,5 %	+/- 3 %
Starting current consumption				6.500 mA	

3.3 Electrical Interface - Output

Tacho type	/2 (open collector)
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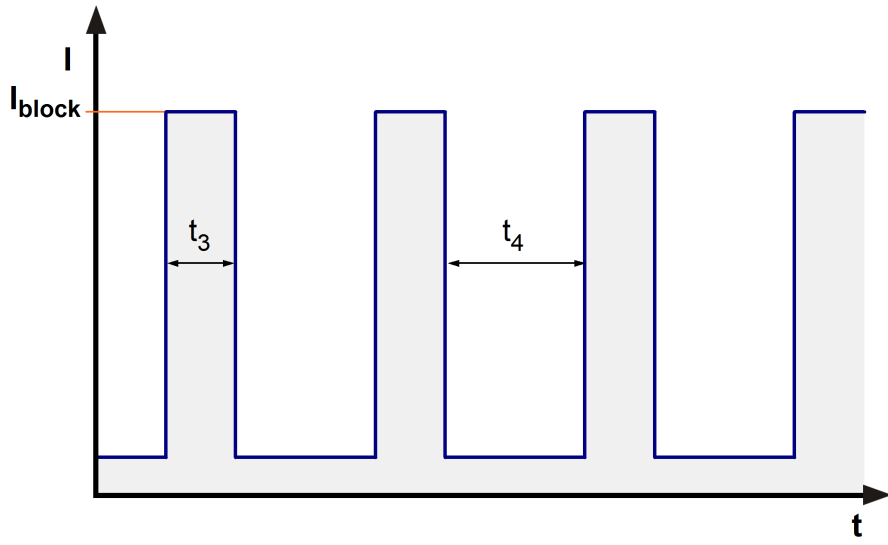


Features	Note	Values
Tacho operating voltage	U_{BS}	$\leq 60\text{ V}$
Tacho signal Low	$U_{S\ low}$	$\leq 0,4\text{ V}$
Tacho signal High	$U_{S\ high}$	$\leq 60\text{ V}$
Maximum sink current	I_{sink}	$\leq 4\text{ mA}$
External resistor	External resistor R_a from U_{BS} to U_S required. All voltages measured to GND.	
Tacho frequency	$(2 \times n) / 60$	
Tacho isolated from motor	No	
Slew rate		$\Rightarrow 0,5\text{ V/us}$

n = revolutions per minute (1/min)

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection	Rectifying diode	
Max. residual current at U_N	$I_F \leq 300\text{ uA}$	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block} approx. 6.500 mA	
Clock signal at locked rotor	t_3 / t_4 typical: 0,5 s / 10 s	



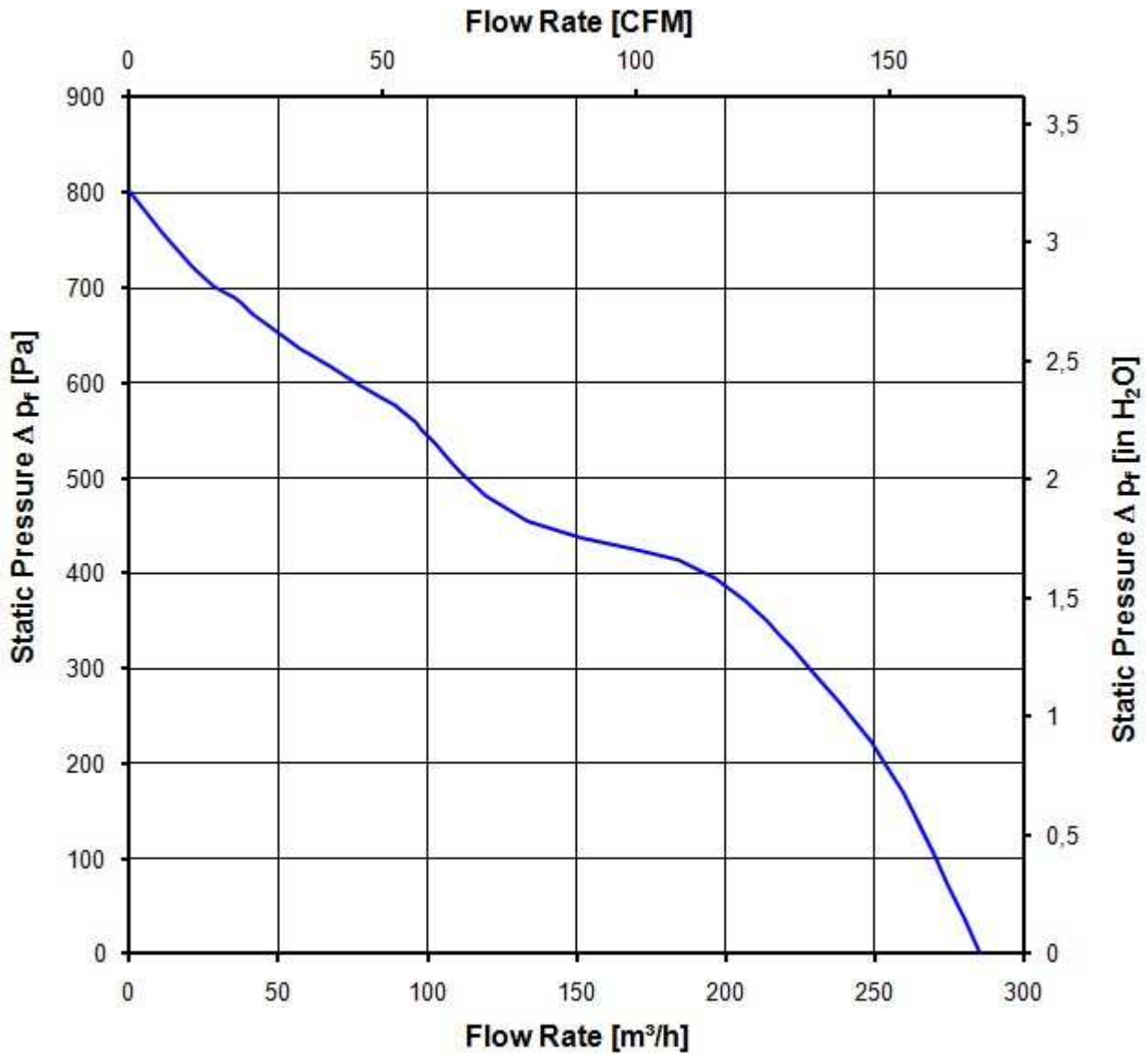
3.5 Aerodynamics

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:

13.000 1/min at free air flow	PWM 100 %;	f: 1 kHz	f: 5 kHz
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Max. free-air flow ($\Delta p = 0 / \dot{V} = \text{max.}$)	285,0 m ³ /h	
Max. static pressure ($\Delta p = \text{max.} / \dot{V} = 0$)	800 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 chapter aerodynamics.

a.) Operation condition:

13.000 1/min at free air flow	PWM 100 %;	f: 1 kHz	f: 5 kHz
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Optimal operating point	190,0 m ³ /h @ 374 Pa	
Sound power level at the optimal operating point	8,0 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	76,0 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 temperature, cyclic; according to DIN EN 60068-2-38, 10 cycle and condensation water check; according to DIN EN ISO 6270-2, 14 days	
Water exposure	Splash water check IPX4; according to DIN EN 60529 VDE 0470, not certified	
Dust requirements	Dust check IP5X; according to DIN EN 60529 VDE 0470, not certified	
Salt fog requirements	salt fog, cyclic, in operation; according to DIN EN 60068-2-52, 3 cycle	

Permitted application area:

The product is for the use in open and unsheltered areas. Direct exposure to water as well as saline ambient conditions are allowed provided that this does not prevent the normal operation.

Pollution degree 3 (according DIN EN 60664-1)

It occurs conductive pollution or dry non-conductive pollution which becomes conductive due to condensation.

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

4.3 EMC

Kind	Radiated Emission; 30 MHz - 1000 MHz
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Accordinging	DIN EN 55032:2016-02
Check accuracy / Limit	Class B
Result	Below limit Class B

Kind	Electrostatic Discharge Immunity Test
Accordinging	DIN EN 61000-4-2:2001-12
Check accuracy / Limit	Contact Discharge +/- 4 kV; Air Discharge +/- 8 kV
Result	B: The monitored function may deviate from designed performance to a specified level during exposure to a disturbance or revert to a fail safe mode or operation, but shall return to normal operation after the disturbance is removed.

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.	500 VAC / 1 Min.	
B.) Routine test Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All connections together to ground.	850 VDC / 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

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 acc. to IPC 9591 at TU = 40 °C	102.500 h	

