Product Data Sheet | 422 J/2HP



The engineer's choice

ebmpapst

422 J/2HP

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6.1 General 12

1 General

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

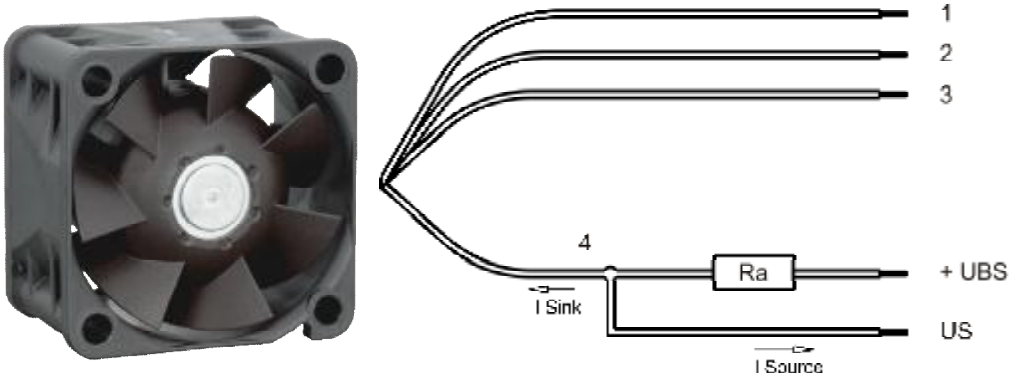
2 Mechanics

2.1 General

Width	40,0 mm	
Height	40,0 mm	
Depth	28,0 mm	
Weight	0,045 kg	
Housing material	Plastic	
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires	
Length of lead wire Tolerance	310 mm +- 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 auxilliaries shown on the schematic diagram (which are required for the intended use) are not part of our delivery.

3 Operating Data

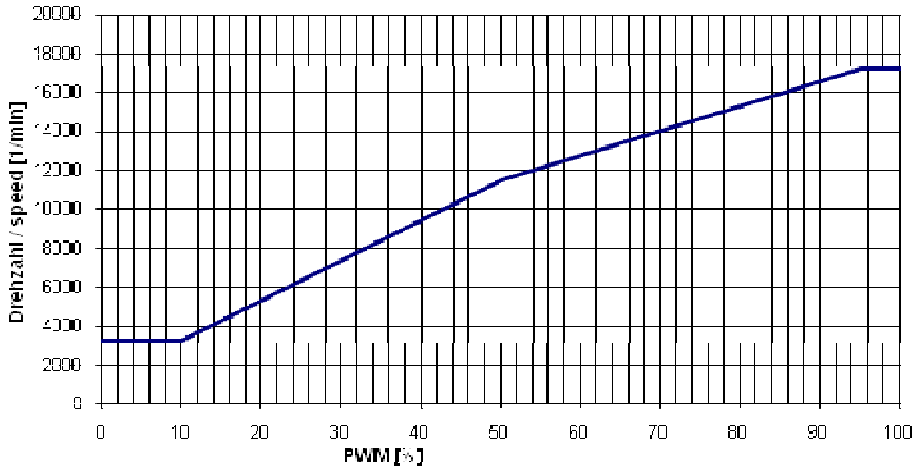
3.1 Operating Data - Electrical Interface - Input

Control input	PWM

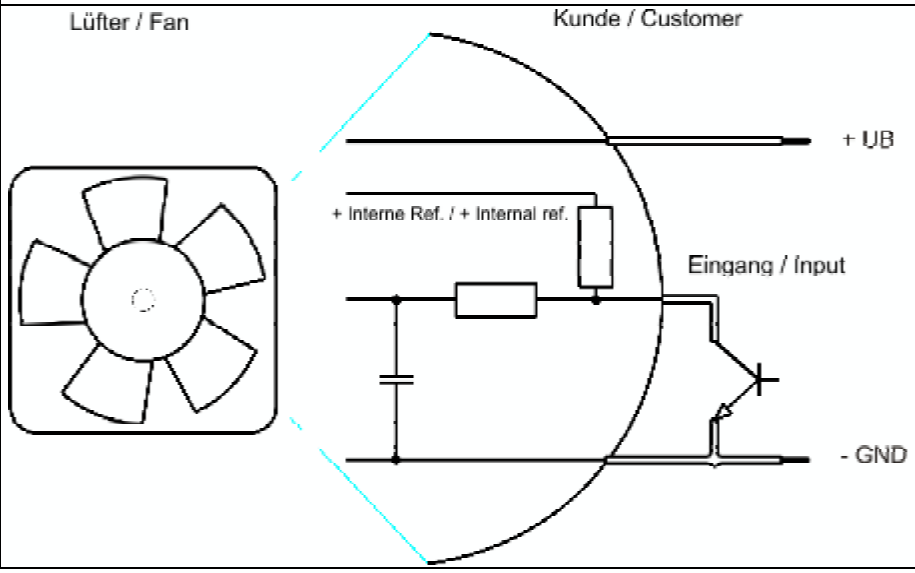
Features

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

Characteristics



Schematics



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		

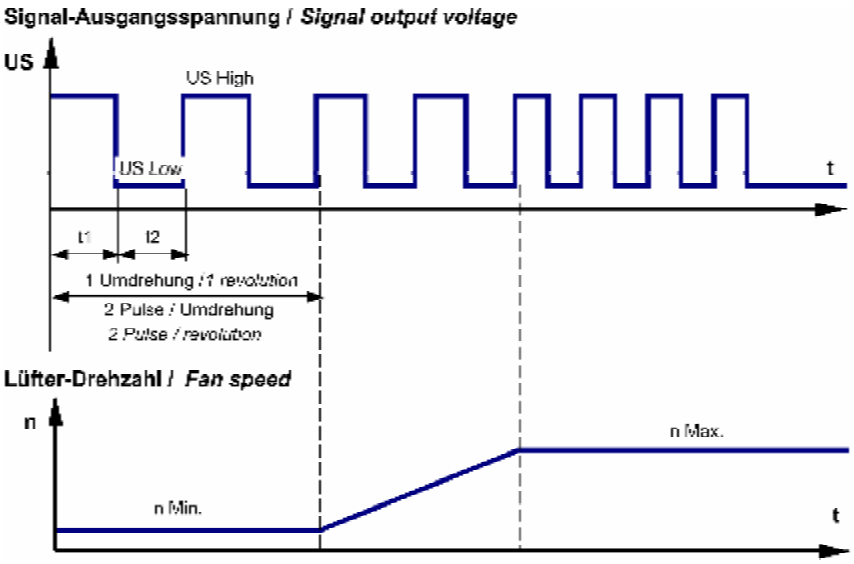
Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	8,0 V		13,8 V
Nominal voltage	$\Delta p = 0$	U_N		12,0 V	
Power consumption Tolerance	$\Delta p = 0$ PWM 0001	P	3,1 W +- 20,0 %	6,8 W +- 15,0 %	8,6 W +- 15,0 %
Current consumption Tolerance	$\Delta p = 0$ PWM 0001	I	385 mA +- 20,0 %	570 mA +- 15,0 %	625 mA +- 15,0 %
Speed Tolerance	$\Delta p = 0$ PWM 0001	n	12.900 1/min +- 15,0 %	17.250 1/min +- 10,0 %	18.700 1/min +- 10,0 %
Starting current consumption				<= 1.800 mA	

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

Features	Condition	Symbol	Values		
Voltage range	Δp = 0	U	8,0 V		13,8 V
Nominal voltage	Δp = 0	U_N		12,0 V	
Power consumption Tolerance	Δp = 0 PWM 0002	P	1,2 W +- 30,0 %	2,5 W +- 25,0 %	3,5 W +- 25,0 %
Current consumption Tolerance	Δp = 0 PWM 0002	I	145 mA +- 30,0 %	210 mA +- 25,0 %	250 mA +- 25,0 %
Speed Tolerance	Δp = 0 PWM 0002	n	7.350 1/min +- 25,0 %	11.500 1/min +- 20 %	13.000 1/min +- 20,0 %

3.3 Operating Data - Electrical Interface -Output

Tacho type	/2 (Open collector)



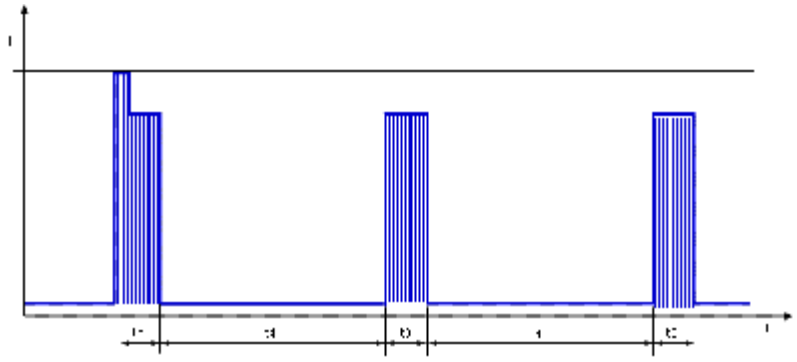
$$Ra = \frac{UBS - US\ Low}{I\ Sink}$$

Features	Note	Values
Tacho operating voltage (UBS)		<= 15 V
Tacho signal Low	I sink: 2 mA	<= 0,4 V
Tacho signal High	I source: 0 mA	15 V
Maximum sink current		<= 4 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

Alarm type	None

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at Un	Rectifying diode IF <= 5 mA	
Locked rotor protection	Auto restart	
Locked rotor current at Un	approx. 1.650 mA	
Clock signal t3/t4 at locked rotor	Typical: 0,45 s / 4,5 s t3: 0,25 s... 0,75 s t4: 2,5 s... 7,5 s	



First pulse t5 typical 0.7s (0.5 .. 1.0s) followed by t4. Afterwards cyclical t3/t4.

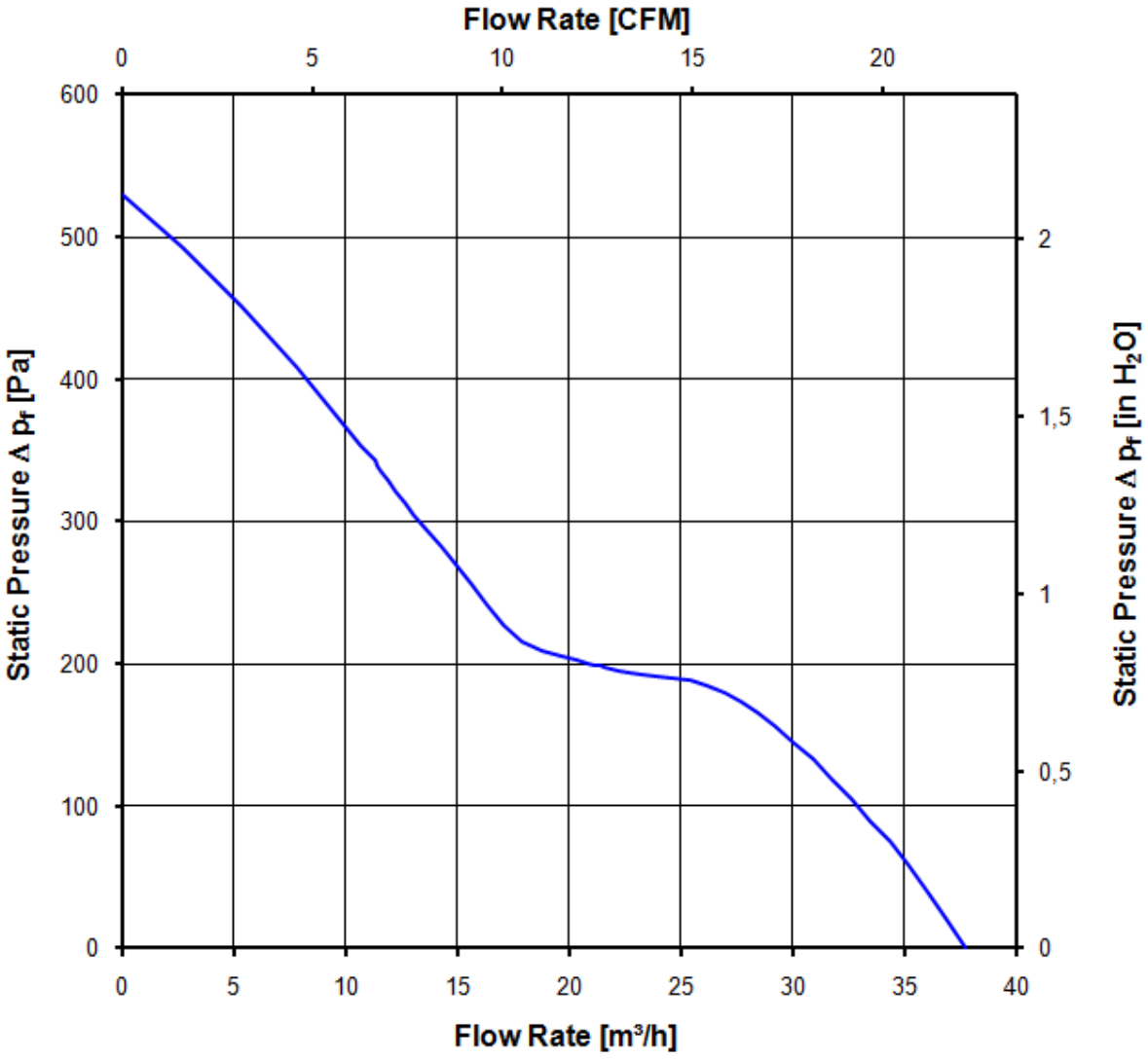
3.5 Aerodynamic

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:

17.250 1/min at free air flow	PWM 100 %; f: 25 kHz		

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	38,0 m3/h	
Max. static pressure (Δp = max. / $\dot{V}$ =0)	530 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 section 3.5

a.) Operation condition:

17.250 1/min at free air flow	PWM 100 %; f: 25 kHz	PWM min.:	PWM max.:

Optimal operating point	26,0 m3/h @ 164 Pa	
Sound power level at the optimal operating point	6,6 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	54,0 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	

*) 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.

4.3 Mechanical requirements

severity level	stationary use		
1	storage / transportation	Random vibration not in use IEC 60068-2-64 Frequency range / ASD G_{RMS} Axes of vibration Test duration	 Random vibration 5 - 20 Hz : 1,0 m² / s³ 20 - 500 Hz : - 3 dB / Oct 0,91 G 3 3 x 30 min
	storage / transportation	Bump not in use IEC 60068-2-29 Shock spectrum Acceleration Duration Number of bumps (+X, -X, -Y, +Y, -Z, +Z) Total bumps	 Bump half sine 18 G 6 ms 100 in each direction 600
	stationary use	Random vibration in use IEC 60068-2-64 Frequency range / ASD G_{RMS} Axes of vibration Test duration	 Random vibration 5 - 10 Hz : +6 dB / Oct 10 - 50 Hz : 1,0 m^2 / s^3 50 - 200 Hz : - 6 dB / Oct 0,65 G 3 3 x 30 min
	stationary use	Bump in use IEC 60068-2-29 Shock spectrum Acceleration Duration Number of bumps (+X, -X, -Y, +Y, -Z, +Z) Total bumps	 Bump half sine 5 G 11 ms 100 in each direction 600

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	
Air and leakage distances		
Protection class	III	

5.2 Approval Tests

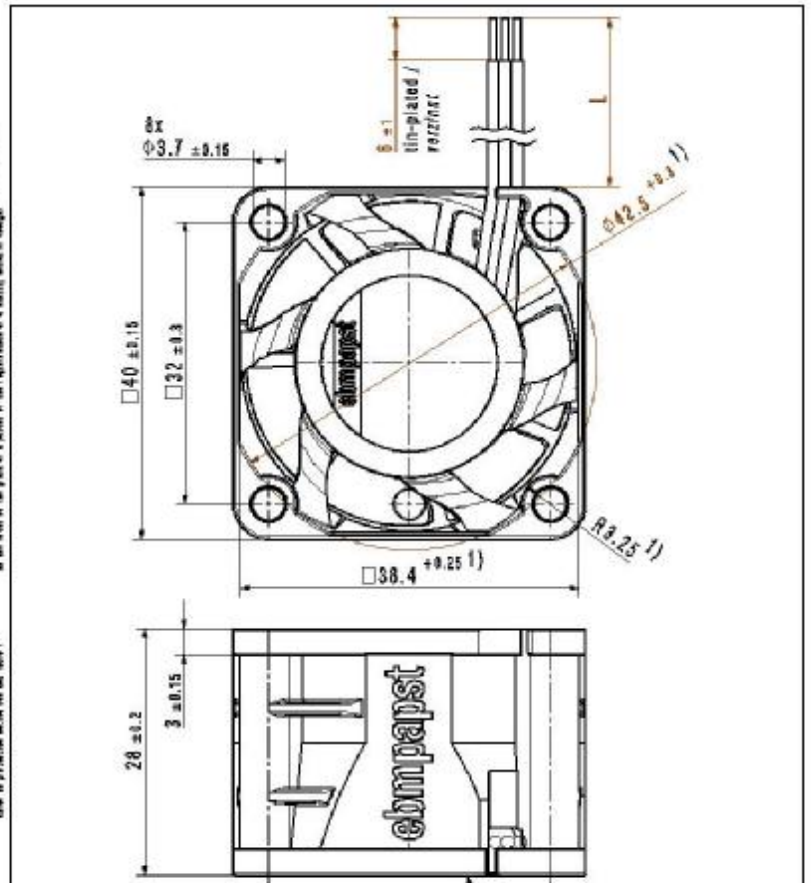
CE	Yes
UL	No
VDE	No
CSA	No
CCC	No

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	



1) Maße für Montagewand / *Dimensions for assembly wall*
- mit Feder spielfrei axial verspannt / *tensioned without axial clearance by spring*
- Anzahl und Länge der Litzen siehe Produktspezifikation Blatt 1
  Number and length of the wires see design specification sheet 1 /

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