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**ebmpapst**

412 F/2H-038

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## 1 General

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

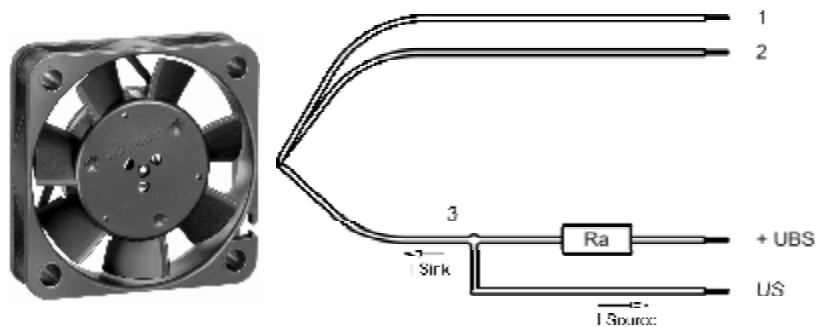
## 2 Mechanics

### 2.1 General

Width	40,0 mm	
Height	40,0 mm	
Depth	10,0 mm	
Weight	0,017 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	wire outlet corner: 50 Ncm remaining corners: 70 Ncm	
Screw size	ISO 4762 - M3 degreased, without an additional brace and without washer	

### 2.2 Connections

Electrical connection	Wires - Plug	
Length of lead wire	300 mm	
Tolerance	+- 10,0 mm	
Wire gauge (AWG)	28	
Insulation diameter	0,98 mm	
Contact	see drawing	



	Colour	Operation
Wire 1	red	+ UB
Wire 2	blue	- GND
Wire 3	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	None
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### 3.2 Electrical Operating Data

Measurement conditions: Normal air density = 1,2 kg/m<sup>3</sup>; 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

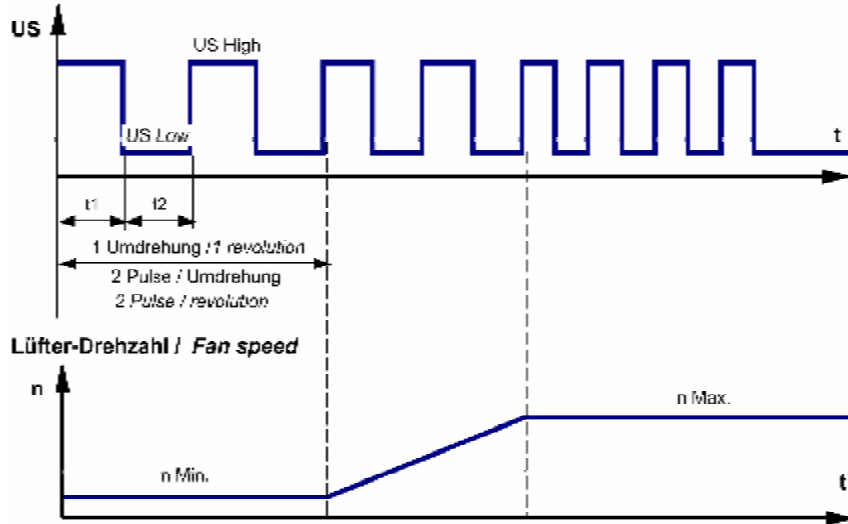
Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	10,0 V		14,0 V
Nominal voltage	$\Delta p = 0$	$U_N$		12,0 V	
Power consumption	$\Delta p = 0$	P	0,6 W	0,8 W	1,1 W
Tolerance	0001		+/- 17,5 %	+/- 12,5 %	+/- 15,0 %
Current consumption	$\Delta p = 0$	I	60 mA	70 mA	80 mA
Tolerance	0001		+/- 17,5 %	+/- 12,5 %	+/- 17,5 %
Speed	$\Delta p = 0$	n	4.900 1/min	6.000 1/min	7.000 1/min
Tolerance	0001		+/- 15,0 %	+/- 10,0 %	+/- 15,0 %
Starting current consumption				137 mA	

3.3 Operating Data - Electrical Interface -Output

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

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

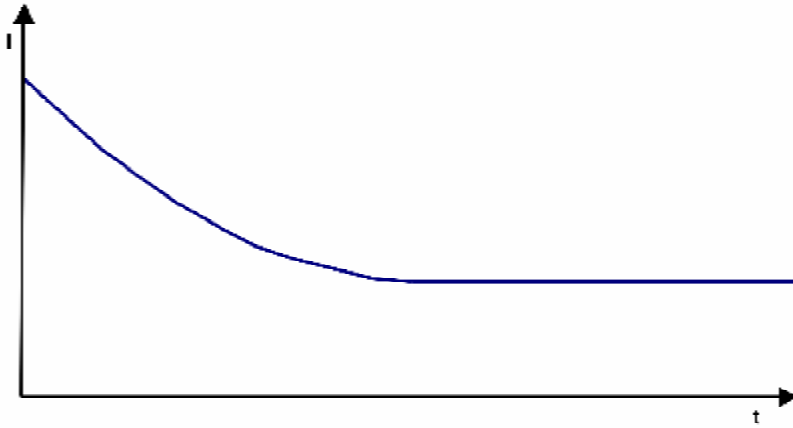


Features	Note	Values
Tacho operating voltage (UBS)		<= 30 V
Tacho signal Low	I sink: 1 mA	<= 0,4 V
Tacho signal High	I source: 0 mA	<= 30 V
Maximum sink current		<= 2 mA
Maximum source current		0 mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency	(2 x n) / 60	
Tacho isolated from motor	No	
Slew rate		=> 0,5 V/us

Alarm type	None
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### 3.4 Electrical Features

Electronic function	None	
Reversed polarity protection	Rectifying diode	
Max. residual current at $U_n$	$I_F \leq 30 \text{ nA}$	
Locked rotor protection	Impedance protected	
Locked rotor current at $U_n$		



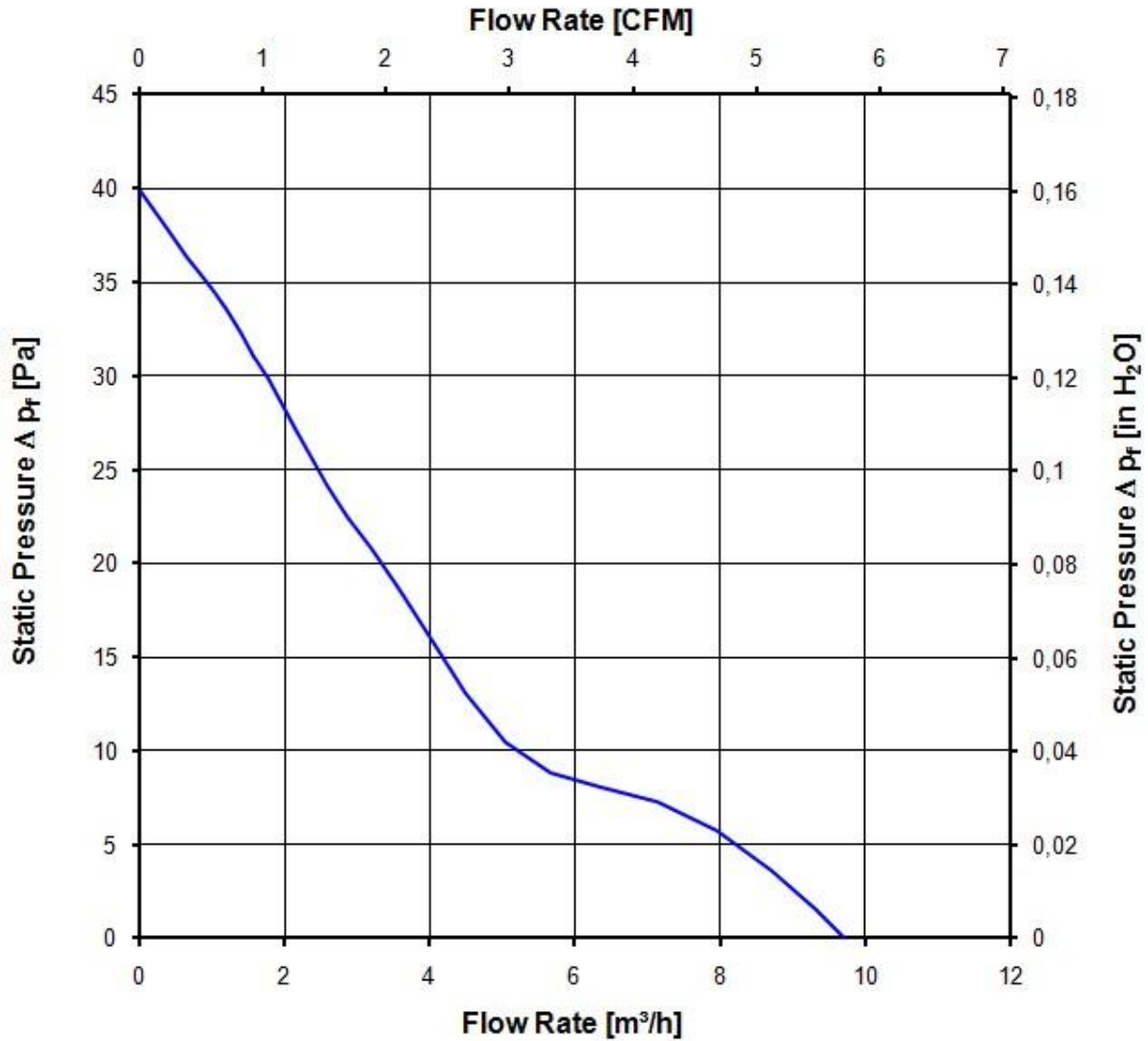
**3.5 Aerodynamic**

Measurement conditions: Measured with a double chamber intake rig acc. to DIN EN ISO 5801.  
 Normal air density = 1,2 kg/m<sup>3</sup>; Temperature 23°C +/- 3°C;  
 In the intake and outlet area should not be any solid obstruction within 0,5 m.

a.) Operation condition:

6.000 1/min at free air flow

Max. free-air flow ( $\Delta p = 0 / \dot{V} = \text{max.}$ )	10,0 m <sup>3</sup> /h	
Max. static pressure ( $\Delta p = \text{max.} / \dot{V} = 0$ )	40 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:

6.000 1/min at free air flow		
Optimal operating point	10,0 m <sup>3</sup> /h @ 0 Pa	
Sound power level at the optimal operating point	4,4 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	26,0 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. 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.	Not applicable	
B.) Routine test Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All connections together to ground.	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	1,0 mm / 1,2 mm	
Protection class	III	

### 5.2 Approval Tests

CE	Yes
UL	Yes / UL507, Electric Fans
VDE	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Yes / C22.2 No. 113 Fans and Ventilators
CCC	No

The approval tests are observed to:

U approval max.: 14,0 V @ TU approval max.: 70,0 °C

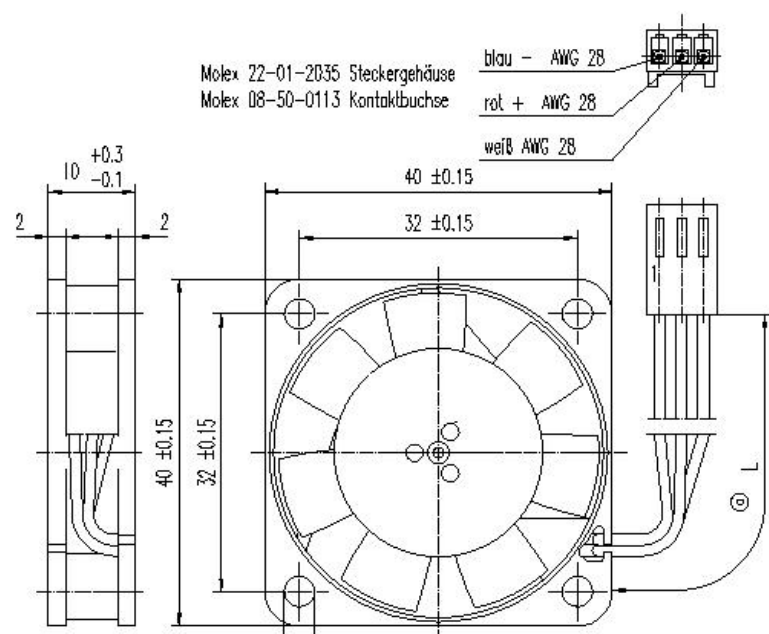
## 6 Reliability

### 6.1 General

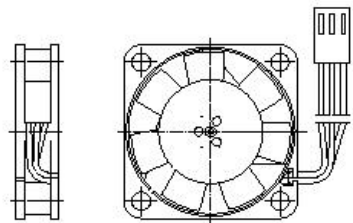
Life expectancy L10 at TU = 20 °C	45.000 h	
Life expectancy L10 at TU = 40 °C	30.000 h	
Life expectancy L10 at TU = 60 °C	15.000 h	
Life expectancy L10 at TU max.	10.000 h	
Life expectancy L10 Delta (40 °C)	47.500 h	

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Schnittzeichnung nach DIN 3: beschriften



M 1:1



082  
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326X  
426X  
516

Allgemeintoleranzen				gilt für: 929 1705 024 412 F/2H-024 L=90±5 929 1705 038 412 F/2H-038 L=306±10 929 1705 039 412 FS-039 L=300±10 929 1705 041 412 F/2H-041 L=136±10				Ⓐ Ⓑ Ⓒ
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