



The engineer's choice

ebmpapst

4412 F/2GL-489

INDEX

1 General3

2 Mechanics3

 2.1 General.....3

 2.2 Connections.....3

3 Operating Data5

 3.1 Operating Data - Electrical Interface - Input.....5

 3.2 Electrical Operating Data6

 3.3 Operating Data - Electrical Interface -Output6

 3.4 Electrical Features.....7

 3.5 Aerodynamic.....8

 3.6 Sound Data.....8

4 Environment.....8

 4.1 General.....8

 4.2 Climatic requirements*)8

 4.3 Mechanical requirements9

5 Safety10

 5.1 Electrical Safety.....10

 5.2 Approval Tests.....10

6 Reliability.....10

 6.1 General.....10

1 General

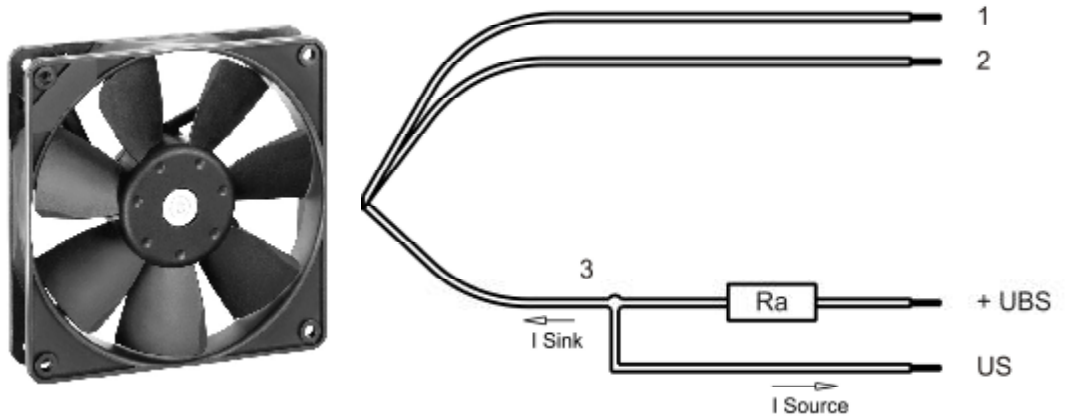
Fan type	Fan	
Rotational direction looking at rotor	counterclockwise	
Airflow direction	Air outlet over struts	
Bearing system	Sleeve bearing	
Mounting position	any	

2 Mechanics**2.1 General**

Width	119,0 mm	
Height	119,0 mm	
Depth	25,4 mm	
Weight	0,175 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	wire outlet corner: 40 Ncm remaining corners: 10 Ncm	
Screw size	ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

Electrical connection	Wires - Plug	
Length of lead wire	323 mm	
Tolerance	+ - 10,0 mm	
Wire gauge (AWG)	24	
Insulation diameter	1,55 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/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

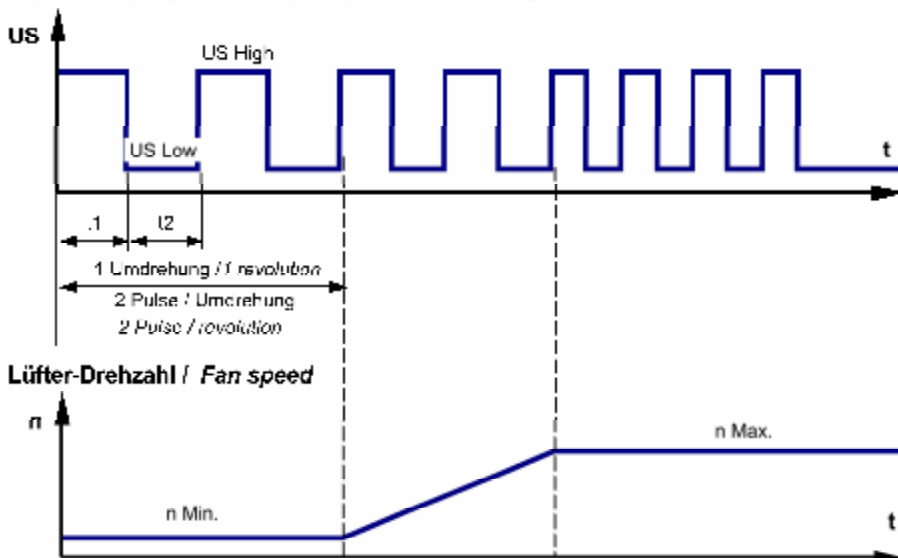
Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	7,0 V		14,0 V
Nominal voltage	$\Delta p = 0$	U_N		12,0 V	
Power consumption	$\Delta p = 0$	P	0,5 W +/- 20,0 %	1,3 W +/- 15,0 %	1,7 W +/- 17,5 %
Tolerance	0001				
Current consumption	$\Delta p = 0$	I	65 mA +/- 20,0 %	104 mA +/- 15,0 %	120 mA +/- 17,5 %
Tolerance	0001				
Speed	$\Delta p = 0$	n	900 1/min +/- 15,0 %	1.600 1/min +/- 10,0 %	1.800 1/min +/- 12,5 %
Tolerance	0001				
Starting current consumption				≤ 240 mA	

3.3 Operating Data - Electrical Interface -Output

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

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

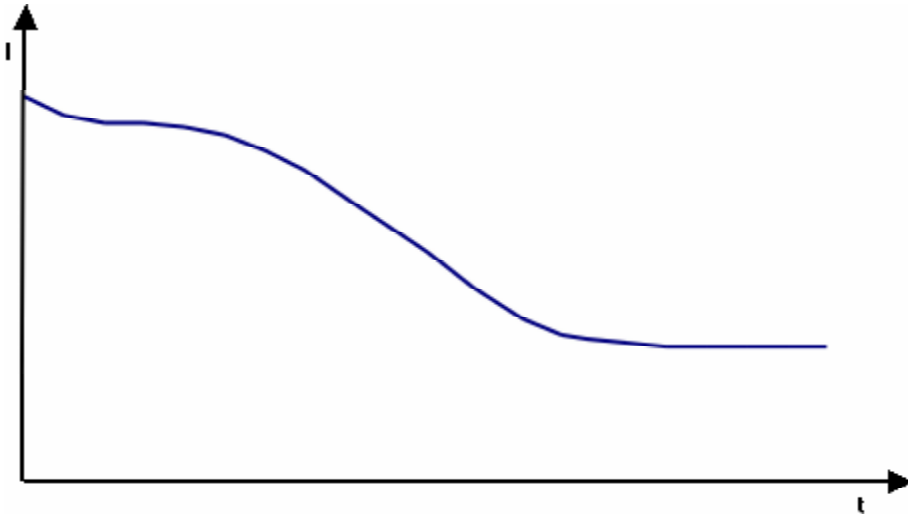


Features	Note	Values
Tacho operating voltage (UBS)		Min.: 4 V Max.: 30 V
Tacho signal Low	I sink: 2 mA	$\leq 0,4$ V
Tacho signal High	I source: 0 mA	$= 30,0$ V
Maximum sink current		≤ 4 mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency	$(2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

Alarm type	None
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3.4 Electrical Features

Electronic function	None	
Reversed polarity protection	PTC	
Max. residual current at Un	IF ≤ 240 mA	
Locked rotor protection	PTC	
Locked rotor current at Un	approx. 240 mA	



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:

1.600 1/min at free air flow		
Max. free-air flow ($\Delta p = 0 / \dot{V} = \text{max.}$)	91,0 m ³ /h	
Max. static pressure ($\Delta p = \text{max.} / \dot{V} = 0$)	20 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:

1.600 1/min at free air flow		
Optimal operating point	68,0 m ³ /h @ 6 Pa	
Sound power level at the optimal operating point	3,9 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.	75 °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.	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	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-M1984 Fans and Ventilators
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	80.000 h	
Life expectancy L10 at TU max.	35.000 h	