



4412 F/2GL-489

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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	

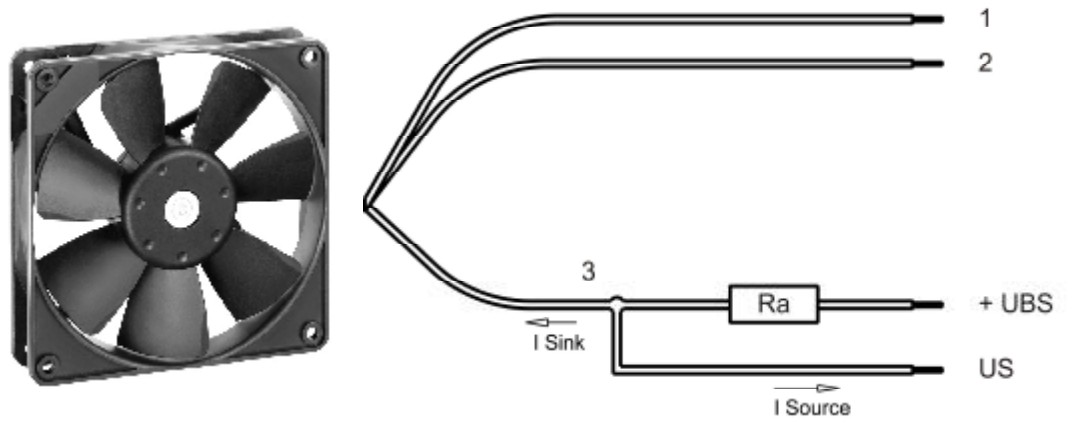
**2 Mechanics**

**2.1 General**

Width	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/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.

Δp = 0: corresp. to free air flow (see section 3.5)  
 I: corresp. to arithm. mean current value

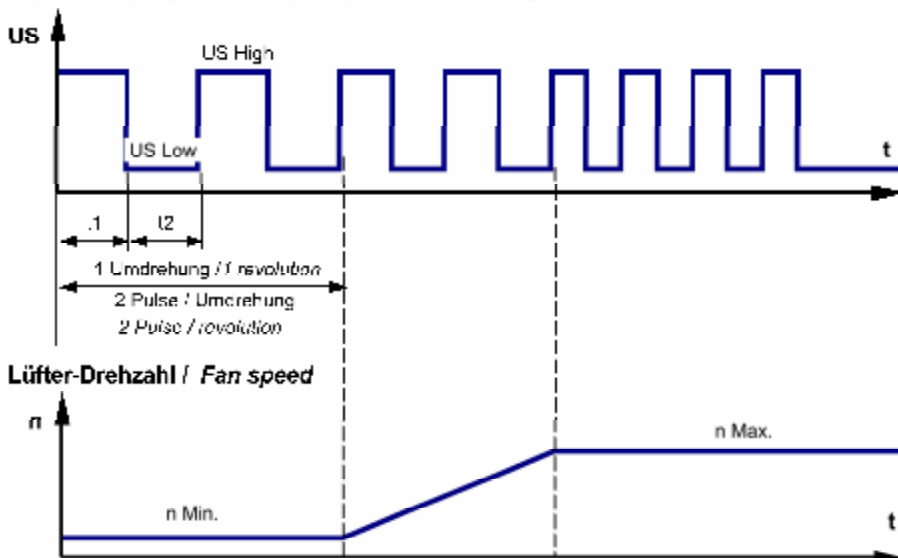
Features	Condition	Symbol	Values		
Voltage range	Δp = 0	U	7,0 V		14,0 V
Nominal voltage	Δp = 0	U <sub>N</sub>		12,0 V	
Power consumption	Δp = 0	P	0,5 W	1,3 W	1,7 W
Tolerance	0001		+/- 20,0 %	+/- 15,0 %	+/- 17,5 %
Current consumption	Δp = 0	I	65 mA	104 mA	120 mA
Tolerance	0001		+/- 20,0 %	+/- 15,0 %	+/- 17,5 %
Speed	Δp = 0	n	900 1/min	1.600 1/min	1.800 1/min
Tolerance	0001		+/- 15,0 %	+/- 10,0 %	+/- 12,5 %
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

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

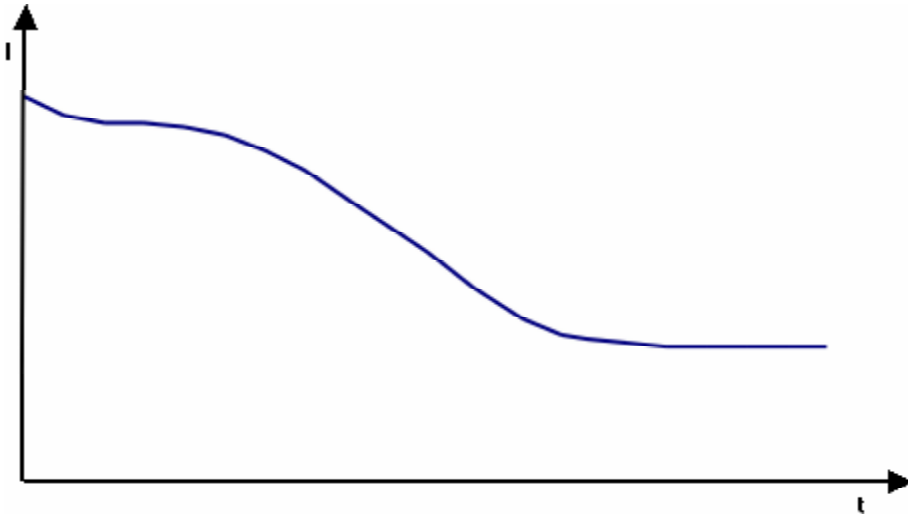


Features	Note	Values
Tacho operating voltage (UBS)		Min.: 4 V    Max.: 30 V
Tacho signal Low	I sink: 2 mA	$\leq 0,4$ V
Tacho signal High	I source: 0 mA	$= 30,0$ V
Maximum sink current		$\leq 4$ mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency	$(2 \times n) / 60$	
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 $\leq 240$ 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/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:

1.600 1/min at free air flow

Max. free-air flow ( $\Delta p = 0 / \dot{V} = \text{max.}$ )	91,0 m <sup>3</sup> /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 L<sub>p</sub>(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 <sup>3</sup> /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	