Product Data Sheet 4412 FGMPR

ebmpapst

The engineer's choice



GREEN TECH

4412 FGMPR

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6.1 General 11

1 General

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

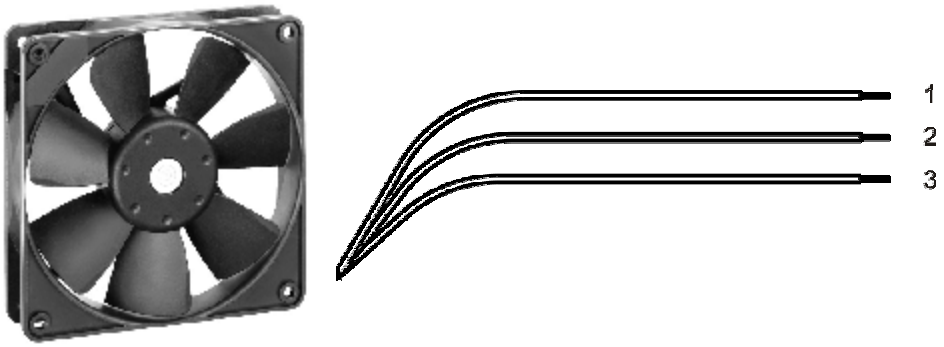
2 Mechanics

2.1 General

Width	119 mm	
Height	119 mm	
Depth	25,4 mm	
Mass	0,170 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges Screw size	Wire outlet corner: 40 Ncm Remaining corners: 10 Ncm ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

Electrical connection	Wires	
Lead wire length Tolerance	L = 310 mm +- 10 mm	
Wire size (AWG)	24	
Insulation diameter	1,55 mm	



Wire	Color	Operation
1	red	+ UB
2	blue	- GND
3	violet	PWM

3 Operating Data

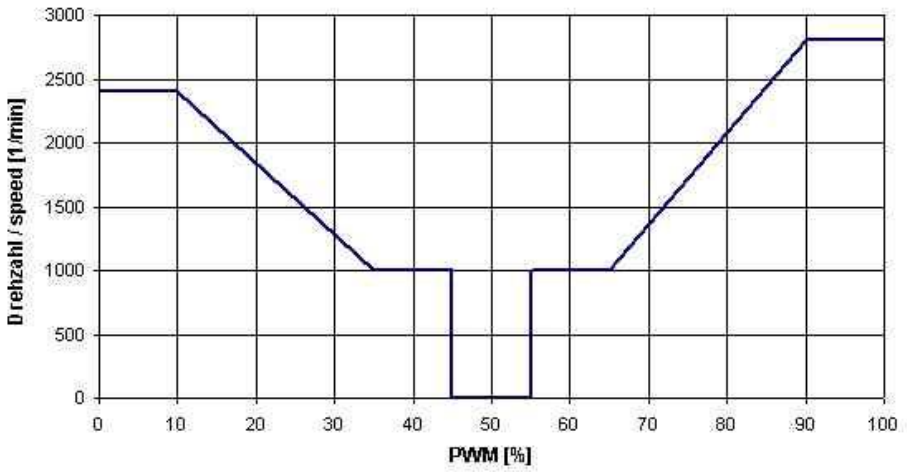
3.1 Electrical Interface - Input

Control input	PWM

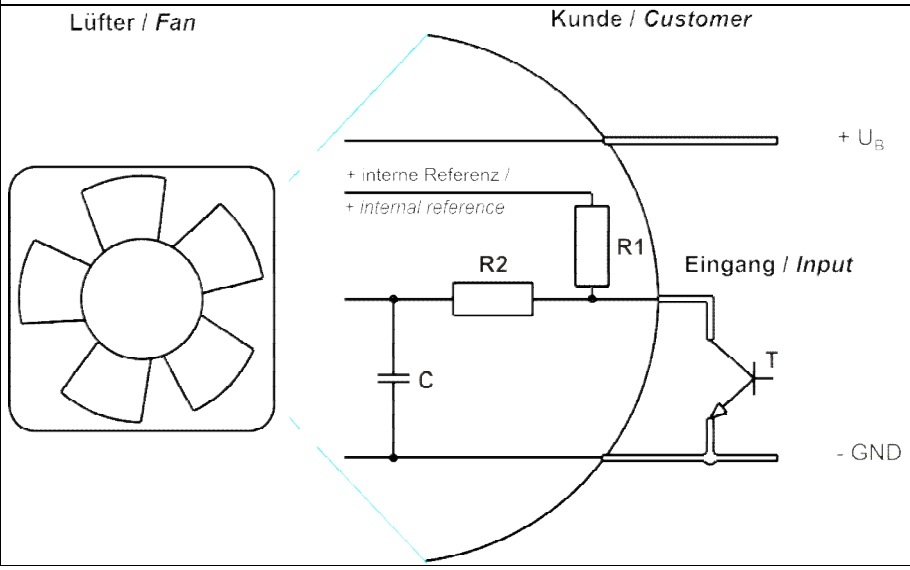
Features

Inpute type	Open collector	
PWM - Frequency		2 kHz - 5 kHz

Characteristics



Schematics



Lüfter mit Drehrichtungsumkehr. 0% - 45% PWM über Stege blasend, 55% - 100% über Stege saugend.

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.

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

Name	Condition		
PWM 0001	PWM: 0 %;	f: 2 kHz	f: 5 kHz

Rotational direction, looking at Rotor: left (air outlet over struts)

Rotational direction, looking at Rotor: left (air outlet over struts)
Rotational direction, looking at Rotor: right (air intake over struts)

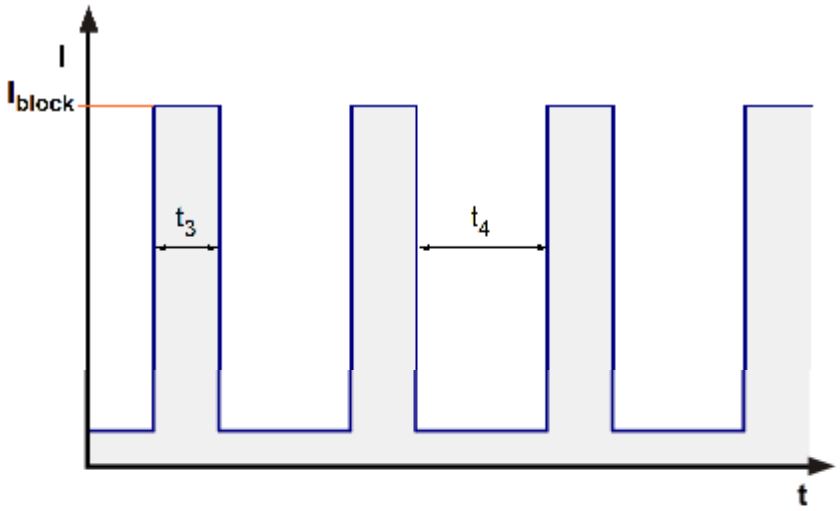
Rotational direction, looking at Rotor: right (air intake over struts)

Features	Condition	Symbol	Values		
Voltage range		U	8,0 V		12,6 V
Nominal voltage		U_N		12,0 V	
Power consumption Tolerance	Δp = 0 PWM 0010	P	1,7 W +- 25,0 %	3,4 W +- 25,0 %	4,1 W +- 25,0 %
Current consumption Tolerance	Δp = 0 PWM 0010	I	208 mA +- 25,0 %	280 mA +- 25,0 %	325 mA +- 25,0 %
Speed Tolerance	Δp = 0 PWM 0010	n	1.700 1/min +- 7,5 %	2.400 1/min +- 5,0 %	2.400 1/min +- 25,0 %
Starting current consumption				< 800 mA	

****) *Vario Pro:*** Unless otherwise specified in the table a general fan speed tolerance applies, relating to the maximum value of the required characteristic curve. Tolerance:+- 5,0 %

3.3 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at U_N	Rectifying diode I_F < 50 uA	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block} approx. 700 mA	
Clock signal at locked rotor	t_3 / t_4 typical: 1,0 s / 10,0 s	


I
I block
t3
t4
t

3.4 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:

2.400 1/min at free air flow	PWM 0 %;	f: 2 kHz	f: 5 kHz

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	137,0 m3/h	
Max. static pressure (Δp = max. / $\dot{V}$ =0)	48 Pa	

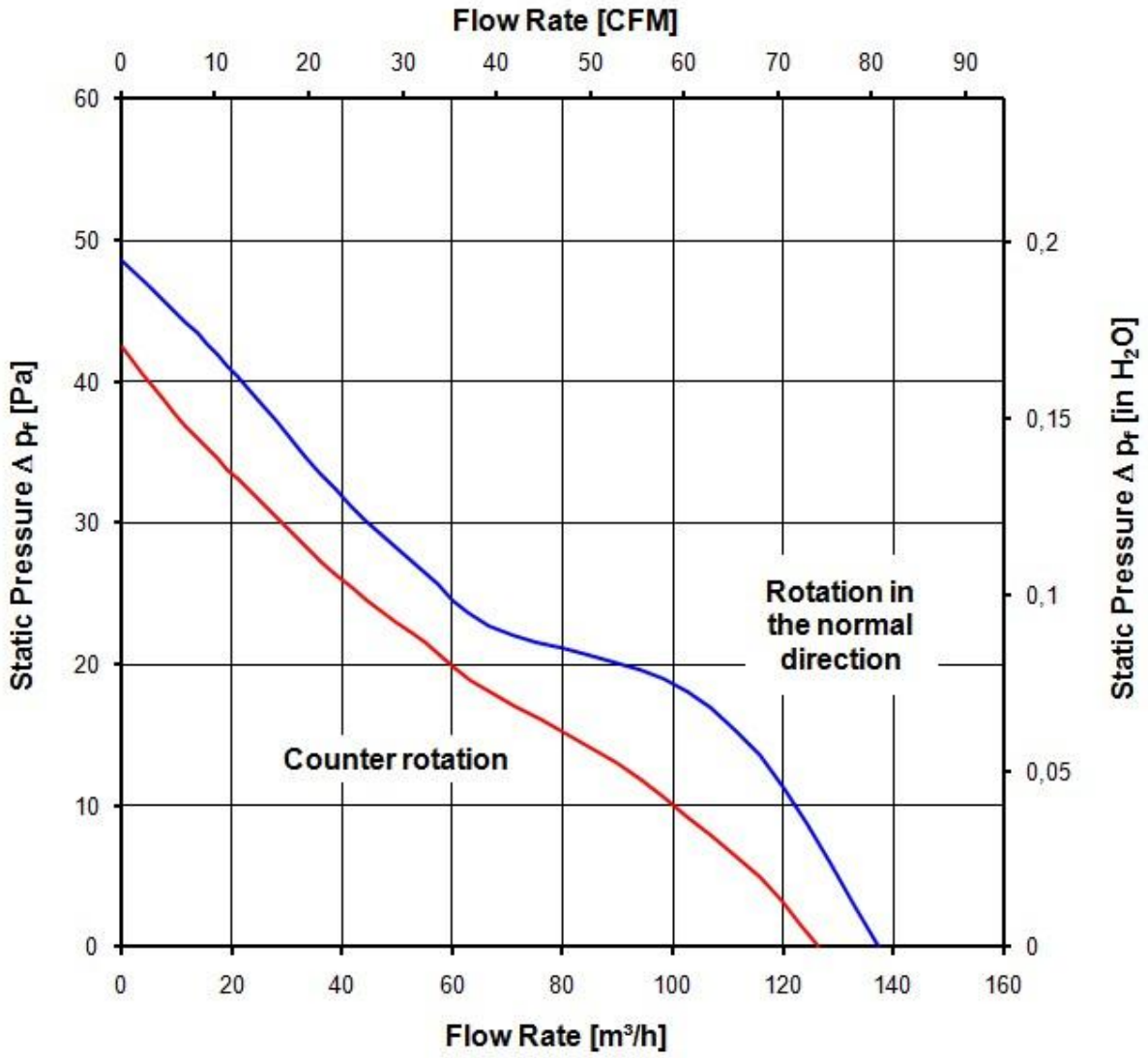
Rotation in normal direction.

b.) Operation condition:

2.800 1/min at free air flow	PWM 100 %;	f: 2 kHz	f: 5 kHz

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	126,0 m3/h	
Max. static pressure(Δp = max. / $\dot{V}$ =0)	42 Pa	

Counter rotation.


Flow Rate [CFM]
0
10
20
30
40
50
60
70
80
90
60
50
40
30
20
10
0
Static Pressure Δ pf [Pa]
0,2
0,15
0,1
0,05
0
Static Pressure Δ pf [in H2O]
Rotation in the normal direction
Counter rotation
0
20
40
60
80
100
120
140
160
Flow Rate [m³/h]

3.5 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)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 chapter aerodynamics.

a.) Operation condition:

2.400 1/min at free air flow	PWM 0 %;	f: 2 kHz	f: 5 kHz

Optimal operating point	130,0 m3/h @ 13 Pa	
Sound power level at the optimal operating point	4,9 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	37,0 dB(A)	

Rotation in normal direction.

b.) Operation condition:

2.800 1/min at free air flow	PWM 100 %;	f: 2 kHz	f: 5 kHz

Optimal operating point	30,0 m3/h @ 25 Pa	
Sound power level at the optimal operating point	5,4 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	49,0 dB(A)	

Counter rotation.

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, cyclic; according to DIN EN 60068-2-30, 6 cycle	
Water exposure	None	
Dust requirements	Dust check; according to DIN EN 60068-2-68, 6g/m2d, 1 day	
Salt fog requirements	None	

Permitted application area:
The product is for the use in sheltered rooms with limited controlled temperature. Occasionally condensed water is allowed. Direct exposure to water must be avoided. Saline ambient conditions must be avoided.

Pollution degree 2 (according DIN EN 60664-1)
It occurs only non-conductive pollution. Occassionally, temporary conductivity caused by condensation occurs.

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. 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	
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

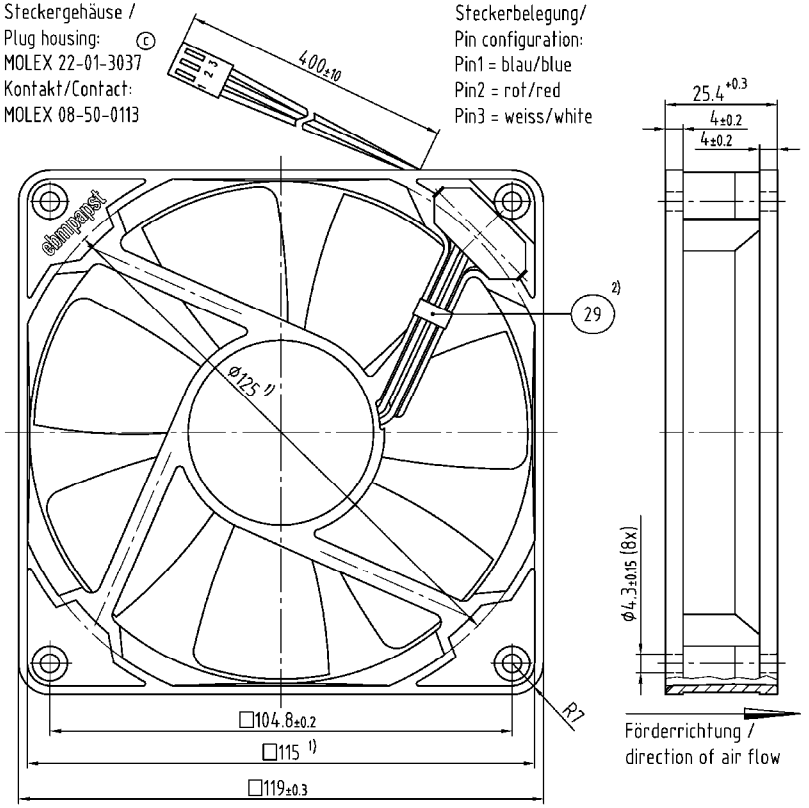
6.1 General

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Schutzvermerk nach DIN ISO 16016 beachten/
Refer to protection notice DIN ISO 16016

Steckergehäuse /
Plug housing: Ⓒ
MOLEX 22-01-3037
Kontakt/Contact:
MOLEX 08-50-0113

Steckerbelegung/
Pin configuration:
Pin1 = blau/blue
Pin2 = rot/red
Pin3 = weiss/white



Förderrichtung /
direction of air flow

1) = Maße für Montagewand /
dimensions for assembly wall

2) = Pos. 29 nur wenn in Stückliste vorhanden /
pos. 29 only if included in bill of material

			ebmpapst	Werkstoff/Material:	Volumen/Volume (mm³):
SAP-Status/State	Aend.-Nr./Change-No.	AutoCAD-System-Version	CAD-Umgebung/ CAD-Environment		Gewicht/Mass (g):
		Datum/Date	Name/Name		
Tolerierung/Tolerances:		Bearb./ Drawn		Artikel/Title	
		Gepr./ Checked			
Allgemeintoleranzen/Gen. tolerances:		Freig./ Releas.			
		ebmpapst		Zchg.-Nr./ Drawing.-No.:	Ers.f.Zchg./ Replaces:
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