

4412 FGMAR-190

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1 General

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

2 Mechanics

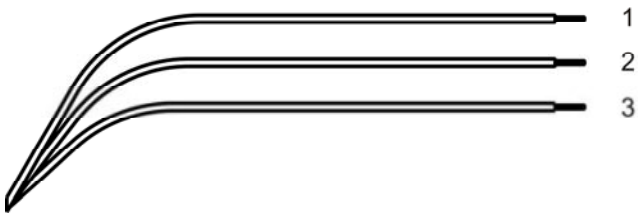
2.1 General

Depth	26,4 mm	
Diameter	126 mm	
Weight	0,165 kg	
Housing material	Plastic	
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires	
Length of lead wire Tolerance	85 mm +- 5 mm	
Wire gauge (AWG)	24	
Insulation diameter	1,55 mm	





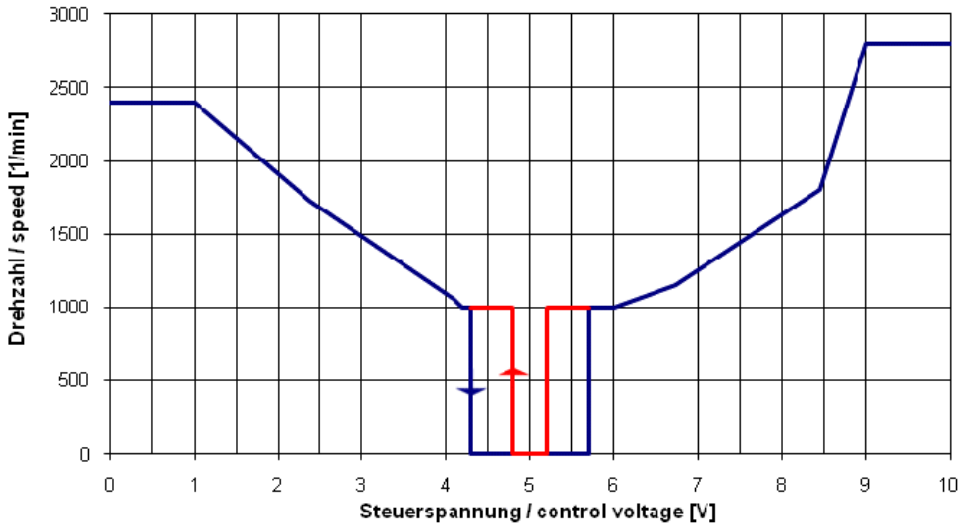
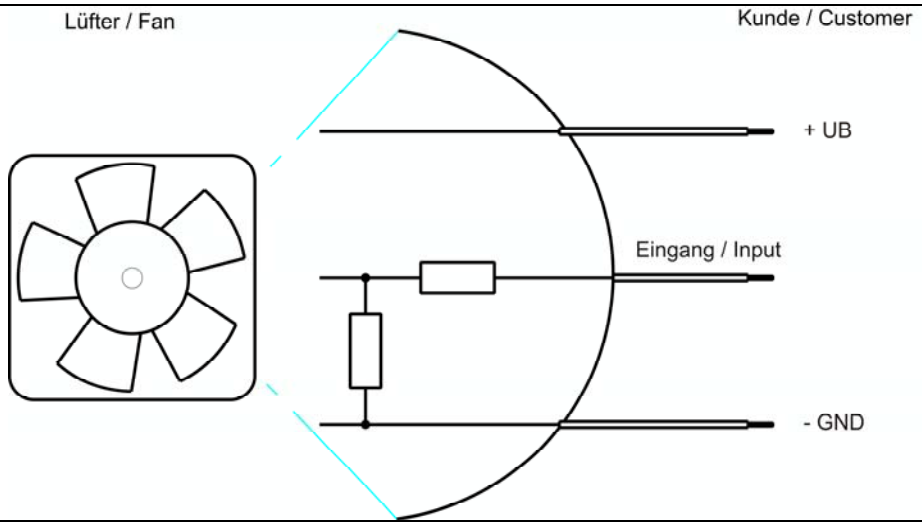
	Colour	Operation
Wire 1	red	+ UB
Wire 2	blue	- GND
Wire 3	violet	CONTR

3 Operating Data

3.1 Operating Data - Electrical Interface - Input

Control input	Analog

Features

Inpute voltage range		0 V - 10 V
Characteristics		
Schematics		

Fan with reversed rotating direction
Setpoint: 0 - 5 V air outlet over struts
Setpoint: 5 - 10 V air intake over struts

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 section 3.5)
I: corresp. to arithm. mean current value

Name	Condition		
U Contr. 0001	U Contr.: 0 V		

Features	Condition	Symbol	Values		
Voltage range	Δp = 0	U	9,5 V		12,6 V
Nominal voltage	Δp = 0	U_N		12,0 V	
Power consumption Tolerance	Δp = 0 U Contr. 0001	P	2,3 W +- 25,0 %	2,95 W +- 25,0 %	2,9 W +- 25,0 %
Current consumption Tolerance	Δp = 0 U Contr. 0001	I	245 mA +- 25,0 %	245 mA +- 25,0 %	230 mA +- 25,0 %
Speed Tolerance	Δp = 0 U Contr. 0001	n	2.250 1/min +- 12,5 %	2.400 1/min +- 9,0 %	2.400 1/min +- 9,0 %
Starting current consumption				920 mA	

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

Name	Condition		
U Contr. 0002	U Contr.: 4,2 V		

Features	Condition	Symbol	Values		
Voltage range	Δp = 0	U	9,5 V		12,6 V
Nominal voltage	Δp = 0	U_N		12,0 V	
Power consumption Tolerance	Δp = 0 U Contr. 0002	P	0,5 W +- 25,0 %	0,6 W +- 25,0 %	0,65 W +- 25,0 %
Current consumption Tolerance	Δp = 0 U Contr. 0002	I	50 mA +- 25,0 %	50 mA +- 25,0 %	50 mA +- 25,0 %
Speed Tolerance	Δp = 0 U Contr. 0002	n	1.000 1/min +- 22,0 %	1.000 1/min +- 22,0 %	1.000 1/min +- 22,0 %

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

Name	Condition		
U Contr. 0004	U Contr.: 6,0 V		

Features	Condition	Symbol	Values		
Voltage range	Δp = 0	U	9,5 V		12,6 V
Nominal voltage	Δp = 0	U_N		12,0 V	
Power consumption	Δp = 0	P	0,45 W	0,55 W	0,6 W

Tolerance	U Contr. 0004		+- 25,0 %	+- 25,0 %	+- 25,0 %
Current consumption Tolerance	Δp = 0 U Contr. 0004	I	45 mA +- 25,0 %	45 mA*) +- 25,0 %	45 mA +- 25,0 %
Speed Tolerance	Δp = 0 U Contr. 0004	n	1.000 1/min +- 25,0 %	1.000 1/min*) +- 25,0 %	1.000 1/min +- 25,0 %

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

Name	**Condition**				
U Contr. 0005	U Contr.: 10,0 V				
Features	**Condition**	**Symbol**	**Values**		
Voltage range	Δp = 0	U	9,5 V		12,6 V
Nominal voltage	Δp = 0	U_N		12,0 V	
Power consumption Tolerance	Δp = 0 U Contr. 0005	P	2,05 W +- 25,0 %	3,0 W +- 25,0 %	2,95 W +- 25,0 %
Current consumption Tolerance	Δp = 0 U Contr. 0005	I	215 mA +- 25,0 %	250 mA*) +- 25,0 %	235 mA +- 25,0 %
Speed Tolerance	Δp = 0 U Contr. 0005	n	2.450 1/min +- 12,5 %	2.800 1/min*) +- 9,0 %	2.800 1/min +- 9,0 %

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

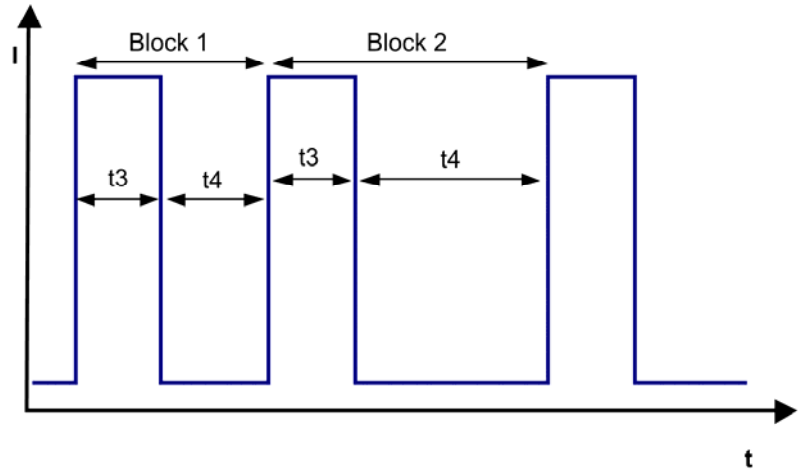
3.3 Operating Data - Electrical Interface -Output

Tacho type	None

Alarm type	None

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at Un	Rectifying diode IF < 50 uA	
Locked rotor protection	Auto restart	
Locked rotor current at Un	approx. 920 mA	



Special locked rotor protection: Block1: t3 / t4 = 0,6 s / 0,3 s; Block2: locked rotor protection t3 / t4 = 0,6 s / 10 s

The fan has a two constant blocking cycle. The behavior of this cycle differs marginally between a blocked rotor when the fan gets started and a blocked rotor during the running operation of the fan. The following figures describe this characteristic.

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:

2.400 1/min at free air flow	U Contr. 0 V		

Max. free-air flow (Δp = 0 / V̇ = max.)	140,0 m3/h	
Max. static pressure (Δp = max. / V̇ =0)	54 Pa	

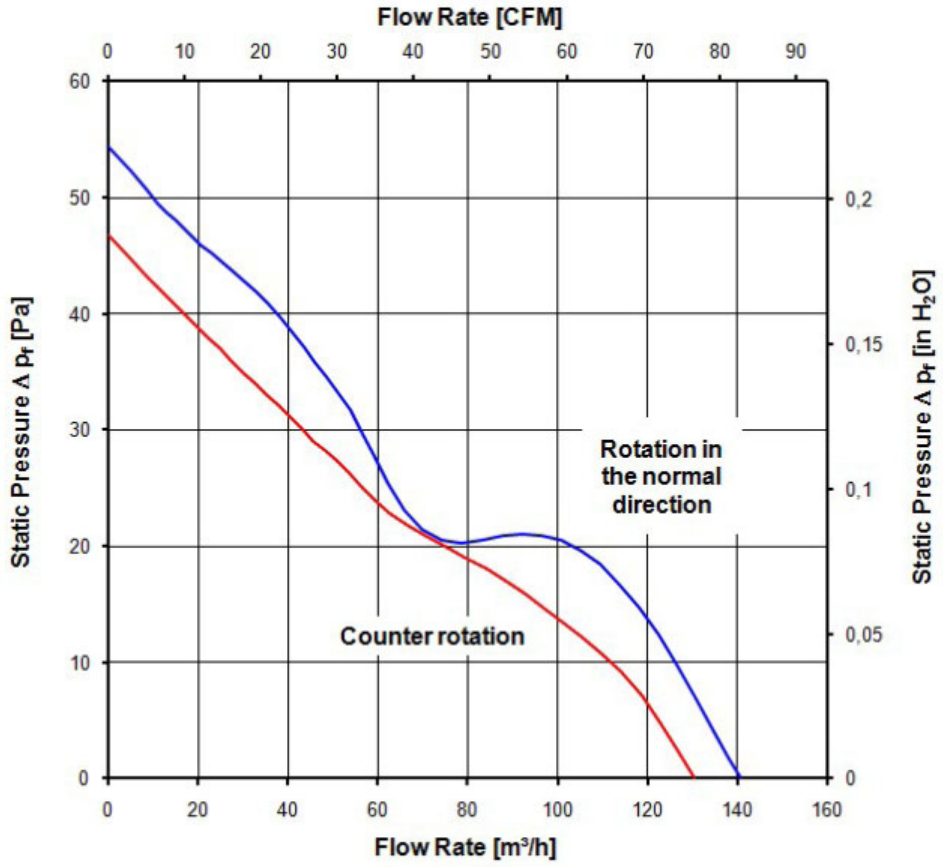
Rotation in normal direction.

b.) Operation condition:

2.800 1/min at free air flow	U Contr. 10,0 V		

Max. free-air flow (Δp = 0 / V̇ = max.)	130,0 m3/h	
Max. static pressure(Δp = max. / V̇ =0)	47 Pa	

Counter rotation.



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:

2.400 1/min at free air flow	U Contr. 0 V		

Optimal operating point	125,0 m3/h @ 10 Pa	
Sound power level at the optimal operating point	4,6 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	35,0 dB(A)	

Rotation in normal direction.

b.) Operation condition

2.800 1/min at free air flow	U Contr. 10,0 V		

Optimal operating point	27,0 m3/h @ 32 Pa	
Sound power level at the optimal operating point	5,6 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	47,0 dB(A)	

Counter rotation.

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	65 °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	
Radiation exposure	None	
Dust requirements	Dust check; according to DIN EN 60068-2-68, 6g/m2d, 1 day	
Salt fog requirements	None	
Harmful gas requirements	None	

*) Permittet 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.

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	

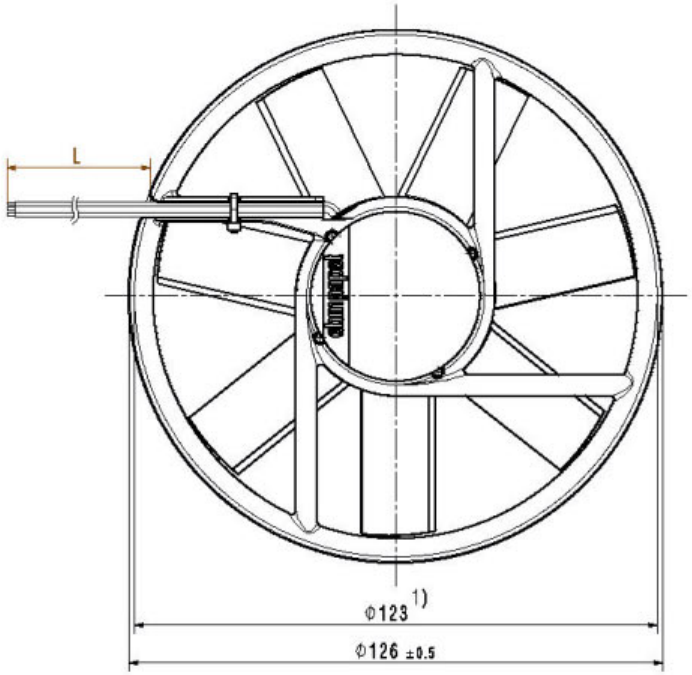
5.2 Approval Tests

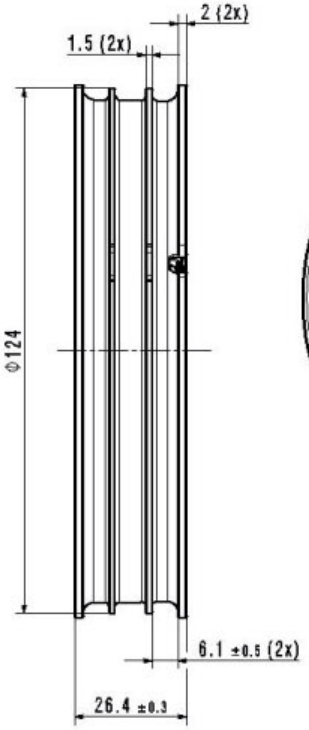
CE	Yes
UL	Yes
VDE	No
CSA	No
CCC	No

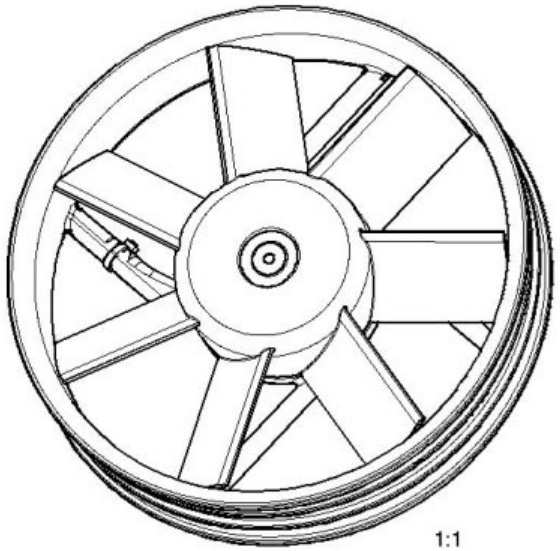
The approval tests are observed to:
Maximal permitted operating voltage (see section 3.1) and max. permitted ambient temperature TU max.

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Hauptförderrichtung (umkehrbar) /
Main direction of flow (reversible)

- Axialspiel bei Kugellagerung (K): 0 (mit Federausgleich)
- Axialspiel bei Gleitlagerung (G): 0,1-0,6

1) Maß für Montagewand

- *Axial clearance with ball bearings (K): 0 (with spring compensation)*
- *Axial clearance with sleeve bearing (G): 0,1-0,6*

1) Dimension for mounting wall

				Werkstoff / Material:	Volumen / Volume (cm³):	
					Gewicht / Mass (g):	
Datum / Name				Artikel / Title:		
Bearb. / Drawn:						
Gepr. / Checked:						
Freig. / Release:						
Toleranzen / Tolerances:		ebmpapst		Zeichn.-Nr. / Drawing No.:		Ers.f.Zeichn. / Replaces:
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