Product Data Sheet 4412FGPR-203

ebmpapst

Die Wahl der Ingenieure



GREEN TECH

4412FGPR-203

INDEX

1 General 3

2 Mechanics 3

2.1 General 3
2.2 Connections 3

3 Operating Data 4

3.1 Operating Data - Electrical Interface - Input 4
3.2 Electrical Operating Data 5
3.3 Operating Data - Electrical Interface - Output 6
3.4 Electrical Features 6
3.5 Aerodynamics 9
3.6 Sound Data 10

4 Environment 10

4.1 General 10
4.2 Climatic Requirements*) 10

5 Safety 11

5.1 Electrical Safety 11
5.2 Approval Tests 11

6 Reliability 11

6.1 General 11

1 General

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

2 Mechanics

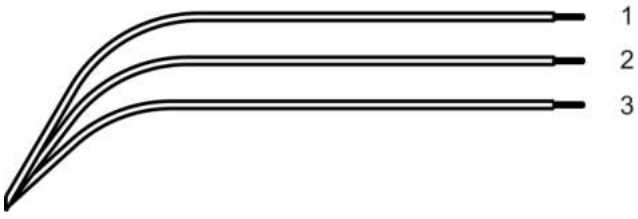
2.1 General

Depth	26,2 mm	
Diameter	127 mm	
Mass	0,175 kg	
Housing material	Plastic	
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires	
Lead wire length Tolerance	L = 310 mm +- 10 mm	
Wire size (AWG)	24	
Insulation diameter	1,35 mm	
Contact	See drawing	





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

3 Operating Data

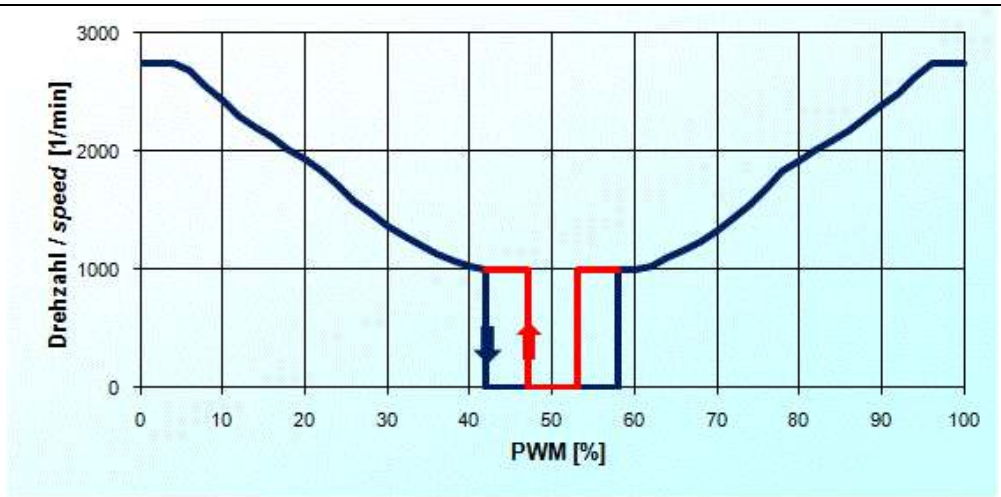
3.1 Operating Data - Electrical Interface - Input

Control input	PWM

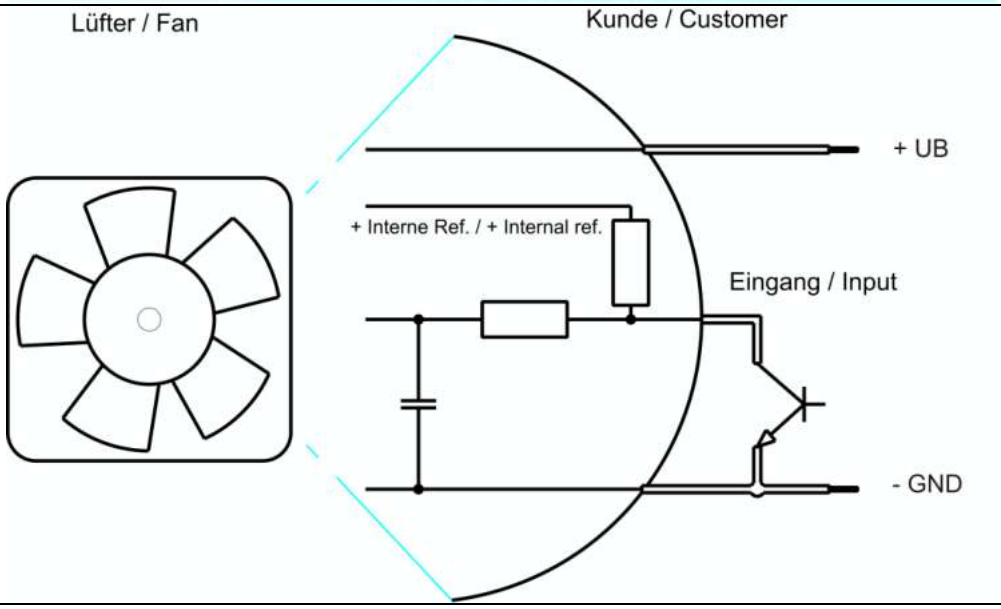
Features

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

Characteristics



Schematics



Fan with reversed rotating direction feature.
Setpoint: 0% - 50% PWM → air outlet over struts / normal operation.
Setpoint: 50% - 100% PWM → air intake over struts / reverse (counter) rotation.

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

Name	Condition		
PWM 0001	PWM: <= 5 %;	f: 2 kHz	f: 5 kHz

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	9,5 V		12,6 V
Nominal voltage	$\Delta p = 0$	U_N		12,0 V	
Power consumption Tolerance	$\Delta p = 0$ PWM 0001	P	1,9 W +- 25,0 %	2 W +- 25,0 %	2 W +- 25,0 %
Current consumption Tolerance	$\Delta p = 0$ PWM 0001	I	200 mA +- 25,0 %	170 mA +- 25,0 %	160 mA +- 25,0 %
Speed Tolerance	$\Delta p = 0$ PWM 0001	n	2.750 1/min +- 12,5 %	2.750 1/min +- 4,0 %	2.750 1/min +- 4,0 %
Starting current consumption				920 mA	

Rotational direction looking at rotor: left (air outlet over struts / normal operation)

Name	Condition		
PWM 0002	PWM: 43 %;	f: 2 kHz	f: 5 kHz

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	9,5 V		12,6 V
Nominal voltage	$\Delta p = 0$	U_N		12,0 V	
Power consumption Tolerance	$\Delta p = 0$ PWM 0002	P	0,4 W +- 25,0 %	0,5 W +- 25,0 %	0,53 W +- 25,0 %
Current consumption Tolerance	$\Delta p = 0$ PWM 0002	I	42 mA +- 25,0 %	42 mA +- 25,0 %	42 mA +- 25,0 %
Speed Tolerance	$\Delta p = 0$ PWM 0002	n	1.000 1/min +- 9,6 %	1.000 1/min +- 9,6 %	1.000 1/min +- 9,6 %

Rotational direction looking at rotor: left (air outlet over struts / normal operation)

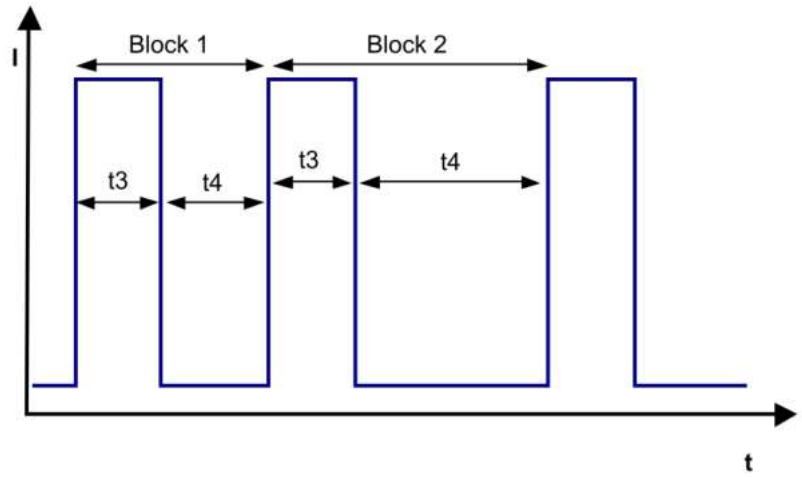
3.3 Operating Data - Electrical Interface - Output

Tacho type	None

Alarm type	None

3.4 Electrical Features

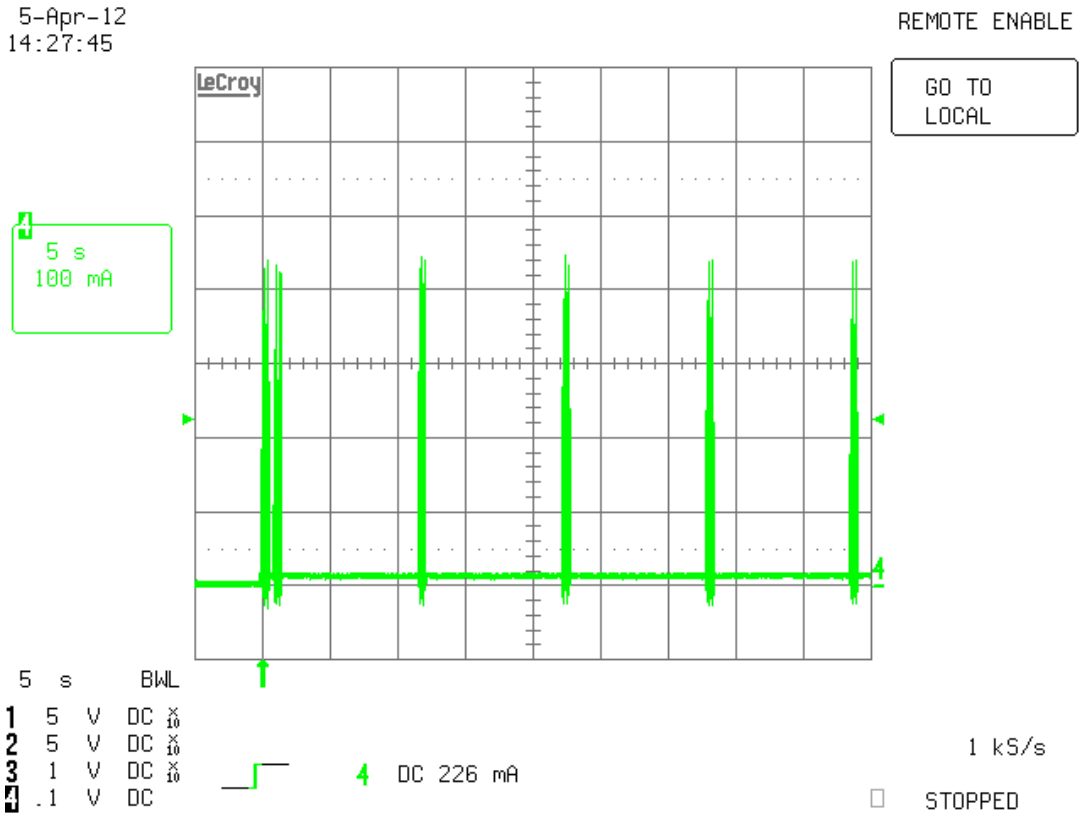
Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at Un	Rectifying diode IF < 50 uA	
Locked rotor protection	Auto restart	
Locked rotor current at Un	approx. 920 mA	

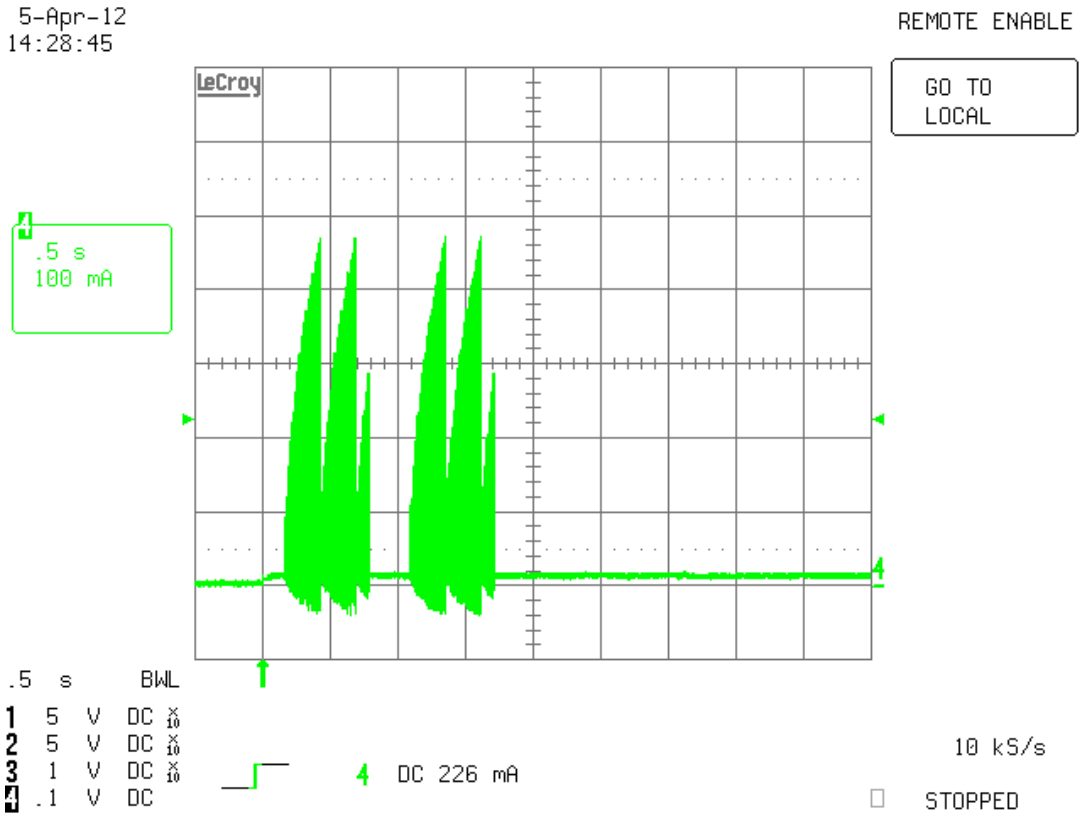


Special locked rotor protection: Block1: t3 / t4 = 0,6 s / 0,3 s; Block2: locked rotor protection t3 / t4 = 0,6 s / 10 s

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

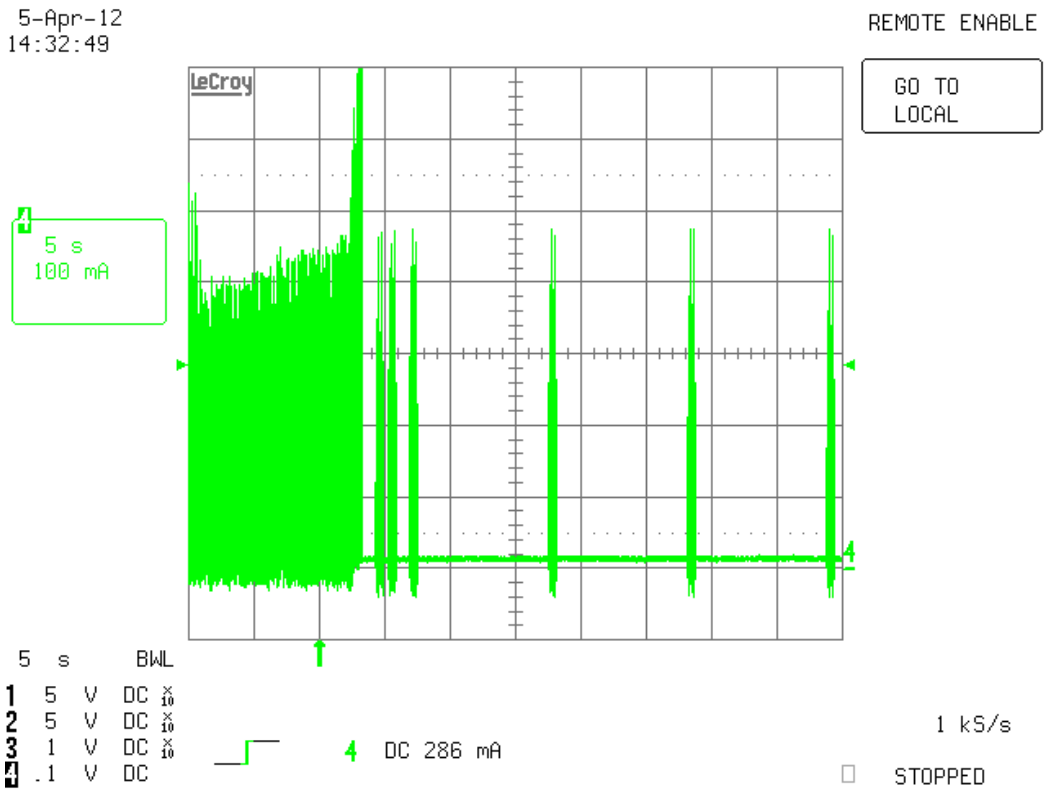
1. Locked rotor during start-up of the fan

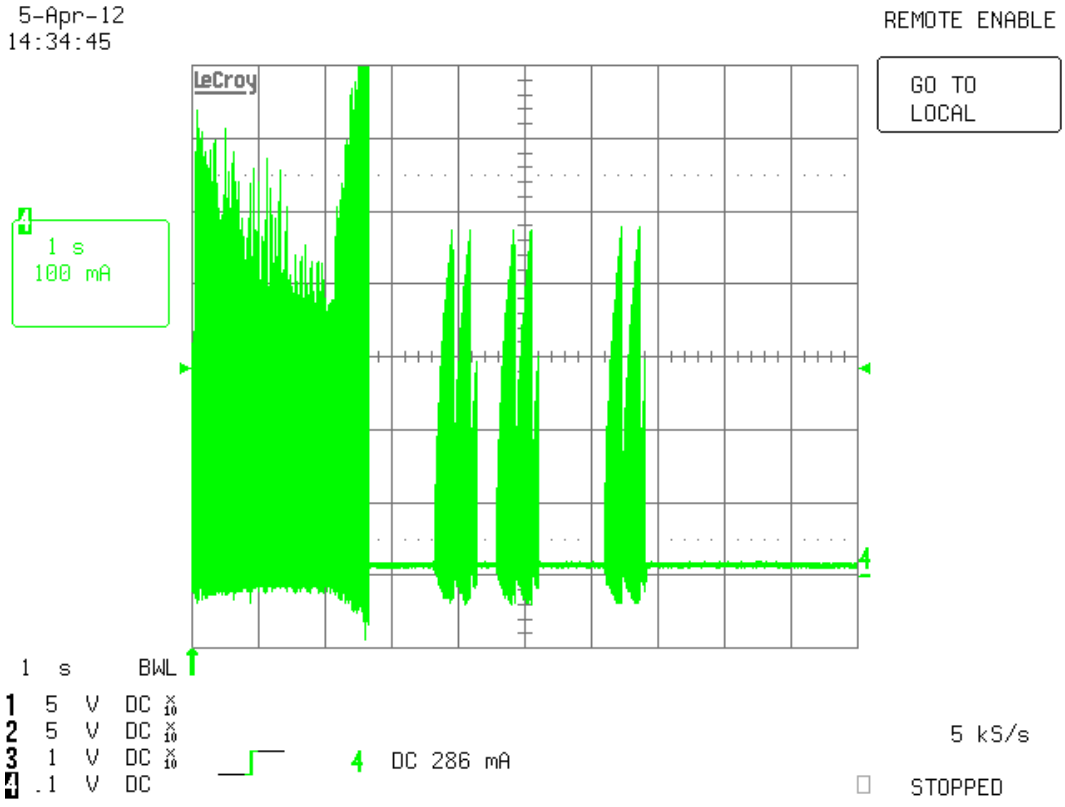




2. Locked rotor after the normal operation of the fan

The internal software measures if the fan has been locked. In this case the second current pulse starts 1 sec later then in case 1.





3.5 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. 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: **Rotation in normal direction.**

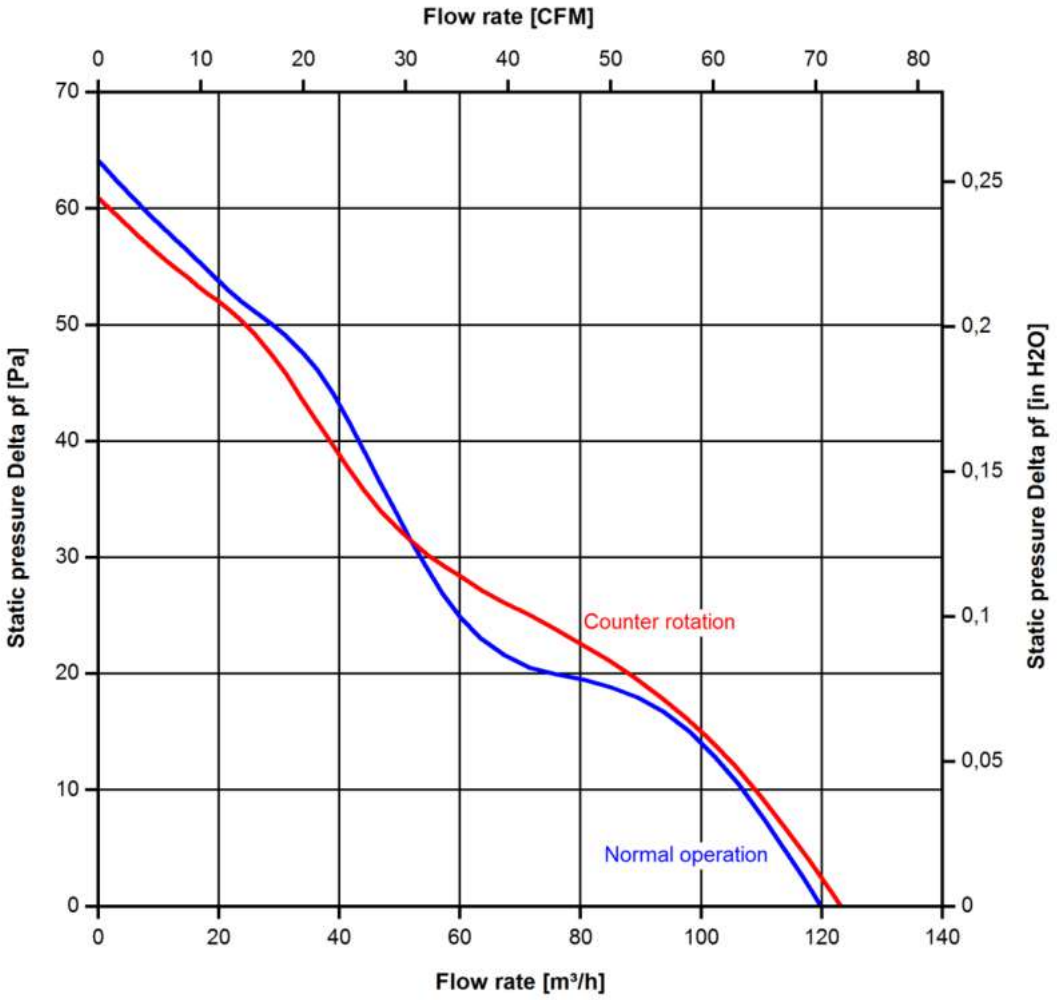
2.750 1/min at free air flow	PWM <= 5 %;	f: 2 kHz	f: 5 kHz

Max. free-air flow (Δp = 0 / V̇ = max.)	120,0 m3/h	
Max. static pressure (Δp = max. / V̇ =0)	64 Pa	

b.) Operation condition: **Rotation in reverse (counter) direction.**

2.750 1/min at free air flow	PWM >= 95 %;	f: 2 kHz	f: 5 kHz

Max. free-air flow (Δp = 0 / V̇ = max.)	123,0 m3/h	
Max. static pressure(Δp = max. / V̇ =0)	61 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: **Rotation in normal direction.**

2.750 1/min at free air flow	PWM <= 5 %	PWM min.: ; f: 2 kHz	PWM max.:; f: 5 kHz

Optimal operating point	94,0 m3/h @ 15 Pa	
Sound power level at the optimal operating point	4,9 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	33,0 dB(A)	

b.) Operation condition: **Rotation in reverse (counter) direction.**

2.750 1/min at free air flow	PWM >= 95 %	PWM min.: ; f: 2 kHz	PWM max.:; f: 5 kHz

Optimal operating point	94,0 m3/h @ 17 Pa	
Sound power level at the optimal operating point	5,7 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	45,0 dB(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	60 °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	

*) 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	
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
VDE	Association for Electrical, Electronic and Information Technologies	Yes
CSA	Canadian Standards Association	Yes
CCC	China Compulsory Certification	No

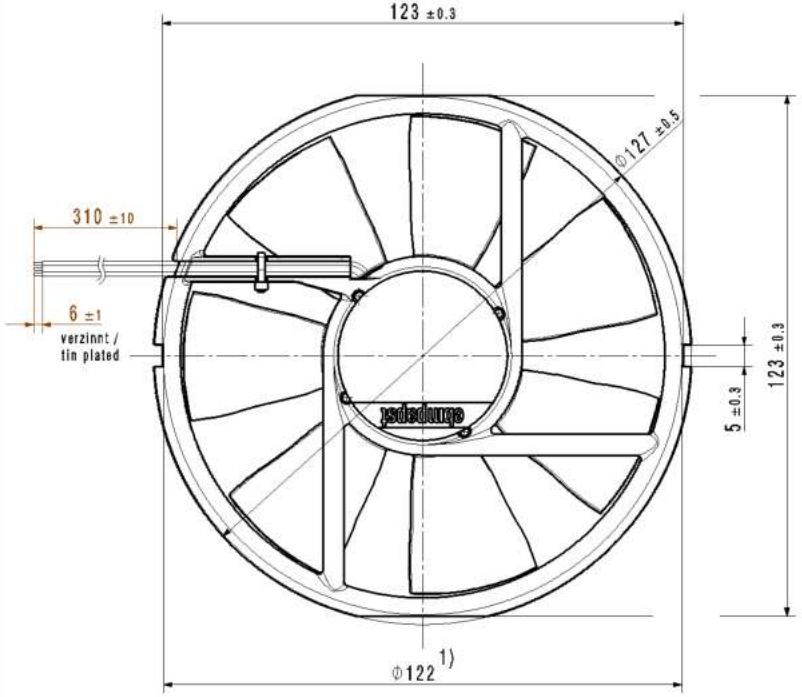
6 Reliability

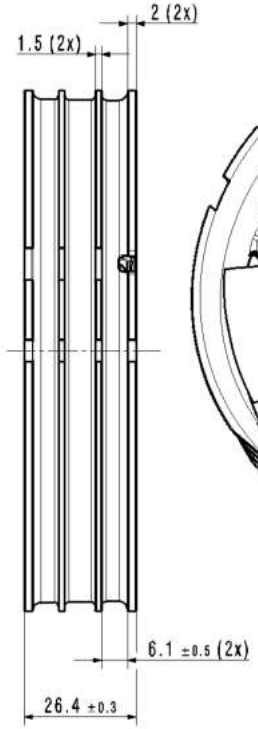
6.1 General

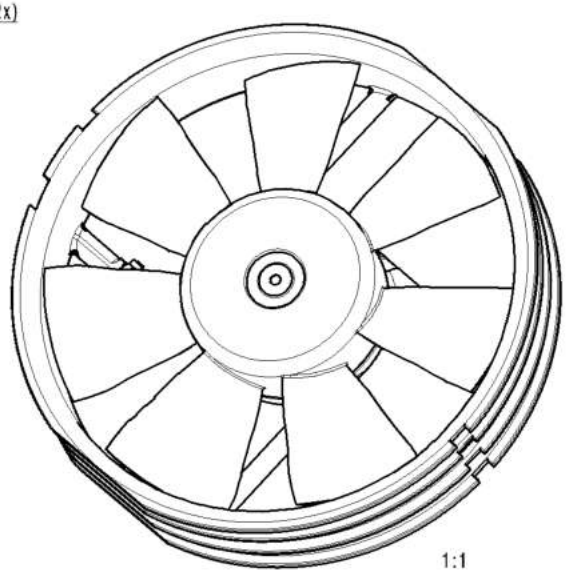
Life expectancy L10 at TU = 40 °C	65.000 h	
Life expectancy L10 at TU max = 60 °C	40.000 h	
Life expectancy L10 IPC (40 °C)	105.000 h	

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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 celarance with ball bearings (K): 0 (with spring compensation)
- Axial celarance with sleeve bearing (G): 0,1-0,6
1) Dimension for mounting wall

SAP-Status/State	Aend.-Nr./ Change-No.	CATIA-System-Version/ CATIA-System-Version	CAD-Umgebung/ CAD-Environment	Werkstoff / Material:	Volumen / Volume (mm³):
		00030010B-CPRIDC-			Gewicht / Mass (g):
		3D-Referenzmodell / 3D-Reference model		Artikel / Title:	
Tolerierung / Tolerances:		Datum	Name		
	Bearb./ Drawn				
Allgemeintoleranzen / Gen. Tolerances:	Gepr./ Checked			Zchg.-Nr./ Drawing No:	Ers.f.Zchg. / Replaces:
	Freig./ Release				

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