

4412F/2GP-553 ebmpapst Datasheet FansCo
sales@fansco.com
www.fansco.com



The engineer's choice

ebmpapst

4412 F/2GP-553

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	5
3.4	Electrical Features	7
3.5	Aerodynamic	8
3.6	Sound Data	9
4	Environment.....	9
4.1	General	9
4.2	Climatic requirements*).....	9
5	Safety.....	10
5.1	Electrical Safety	10
5.2	Approval Tests	10

1 General

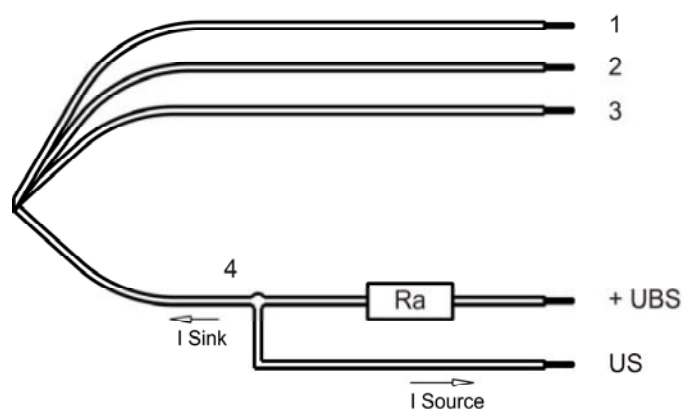
Fan type	Fan	
Rotational direction looking at rotor	counterclockwise	
Airflow direction	Air outlet over struts	
Bearing system	Sleeve bearing	
Mounting position	any	

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	240 mm	
Tolerance	+/- 10,0 mm	
Wire gauge (AWG)	24	
Insulation diameter	1,55 mm	
Contact / Connetcor	see drawing	



	Colour	Operation
Wire 1	red	+ UB
Wire 2	blue	- GND
Wire 3	violet	PWM
Wire 4	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

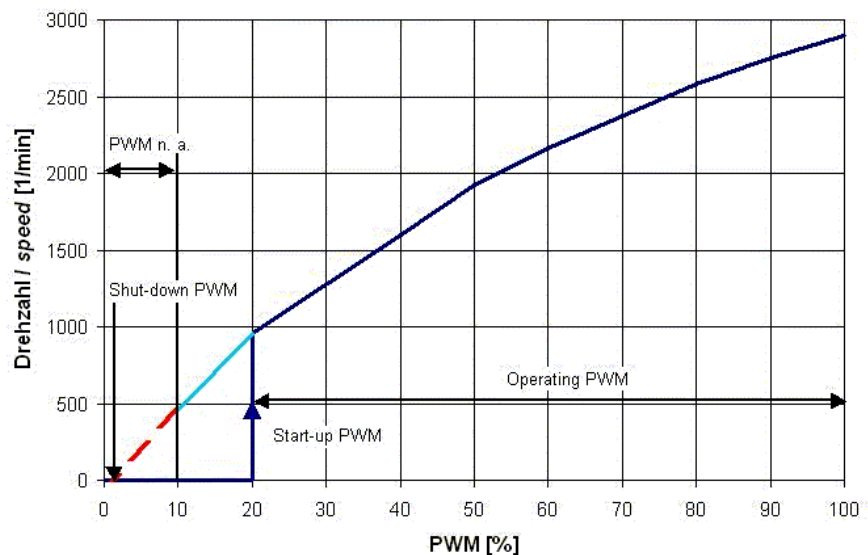
3.1 Operating Data - Electrical Interface - Input

Control input	PWM
---------------	-----

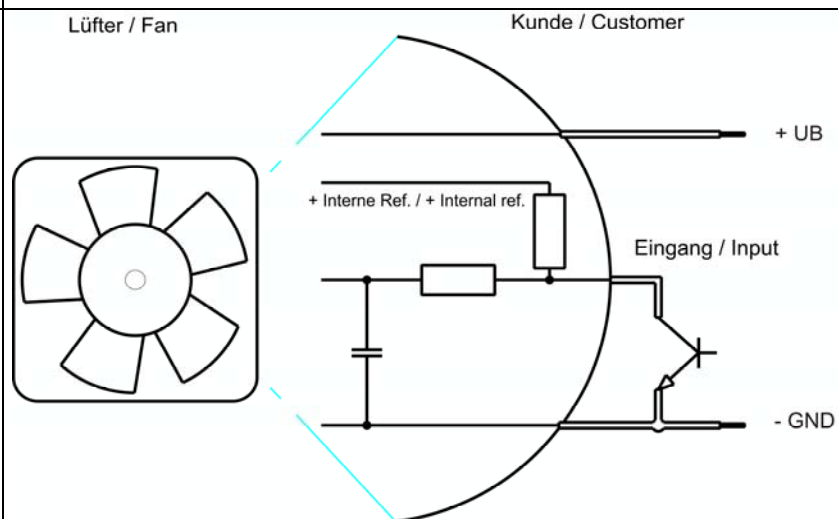
Features

Input type	Open collector	
PWM - Frequency		21 kHz - 28 kHz
Max. voltage for logic "Low"		0,8 V
Max. voltage for logic "High"	Open circuit voltage	5,25 V
Maximum source current	short circuit current	5 mA
4 wire startup condition	PWM duty cycle	> 20 %
4 wire operation condition after startup	PWM duty cycle	10 % - 100 %
PWM not applicable	PWM n.a.	0 % - 10 %

Characteristics



Schematics



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: 100 %;	f: 21 kHz	f: 25 kHz

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	10,8 V		12,6 V
Nominal voltage	$\Delta p = 0$	U_N		12,0 V	
Power consumption	$\Delta p = 0$	P	5,2 W	6,5 W	7,2 W
Tolerance	PWM 0001		+/- 17,5 %	+/- 12,5 %	+/- 15,0 %
Current consumption	$\Delta p = 0$	I	480 mA	545 mA	570 mA
Tolerance	PWM 0001		+/- 17,5 %	+/- 12,5 %	+/- 15,0 %
Speed	$\Delta p = 0$	n	2.650 1/min	2.900 1/min	3.000 1/min
Tolerance	PWM 0001		+/- 12,5 %	+/- 7,5 %	+/- 10,0 %
Starting current consumption				1.200 mA	

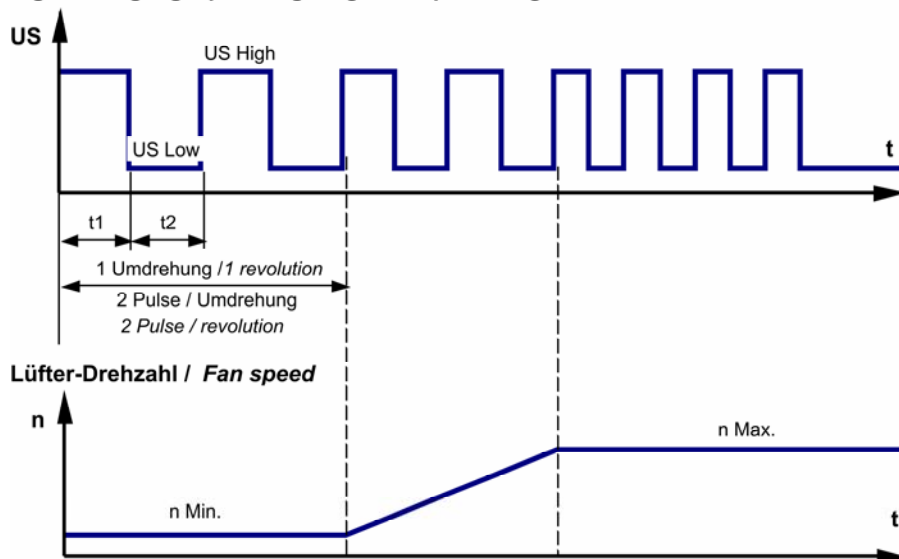
Name	Condition		
PWM 0002	PWM: 50 %;	f: 21 kHz	f: 25 kHz

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	10,8 V		12,6 V
Nominal voltage	$\Delta p = 0$	U_N		12,0 V	
Power consumption	$\Delta p = 0$	P	1,6 W	2,0 W	2,2 W
Tolerance	PWM 0002		+/- 17,5 %	+/- 12,5 %	+/- 15,0 %
Current consumption	$\Delta p = 0$	I	145 mA	165 mA	175 mA
Tolerance	PWM 0002		+/- 17,5 %	+/- 12,5 %	+/- 15,0 %
Speed	$\Delta p = 0$	n	1.750 1/min	1.950 1/min	2.050 1/min
Tolerance	PWM 0002		+/- 12,5 %	+/- 7,5 %	+/- 10,0 %

3.3 Operating Data - Electrical Interface -Output

Tacho type	/2 (Open collector)
------------	---------------------

Signal-Ausgangsspannung / Signal output voltage



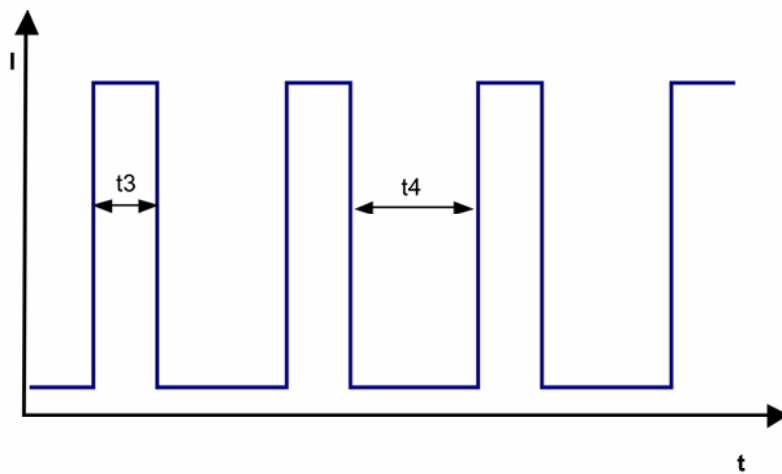
$$R_a = \frac{U_{BS} - U_{S \text{ Low}}}{I_{\text{Sink}}}$$

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

Alarm type	None
------------	------

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection	Rectifying diode	
Max. residual current at U_n	$I_F \leq 100 \mu A$	
Locked rotor protection	Auto restart	
Locked rotor current at U_n	approx. 1.200 mA	
Clock signal t3/t4 at locked rotor	Typical: 1,9 s / 8,2 s t3: 0,8 s... 4,7 s t4: 2,8 s... 27,0 s	



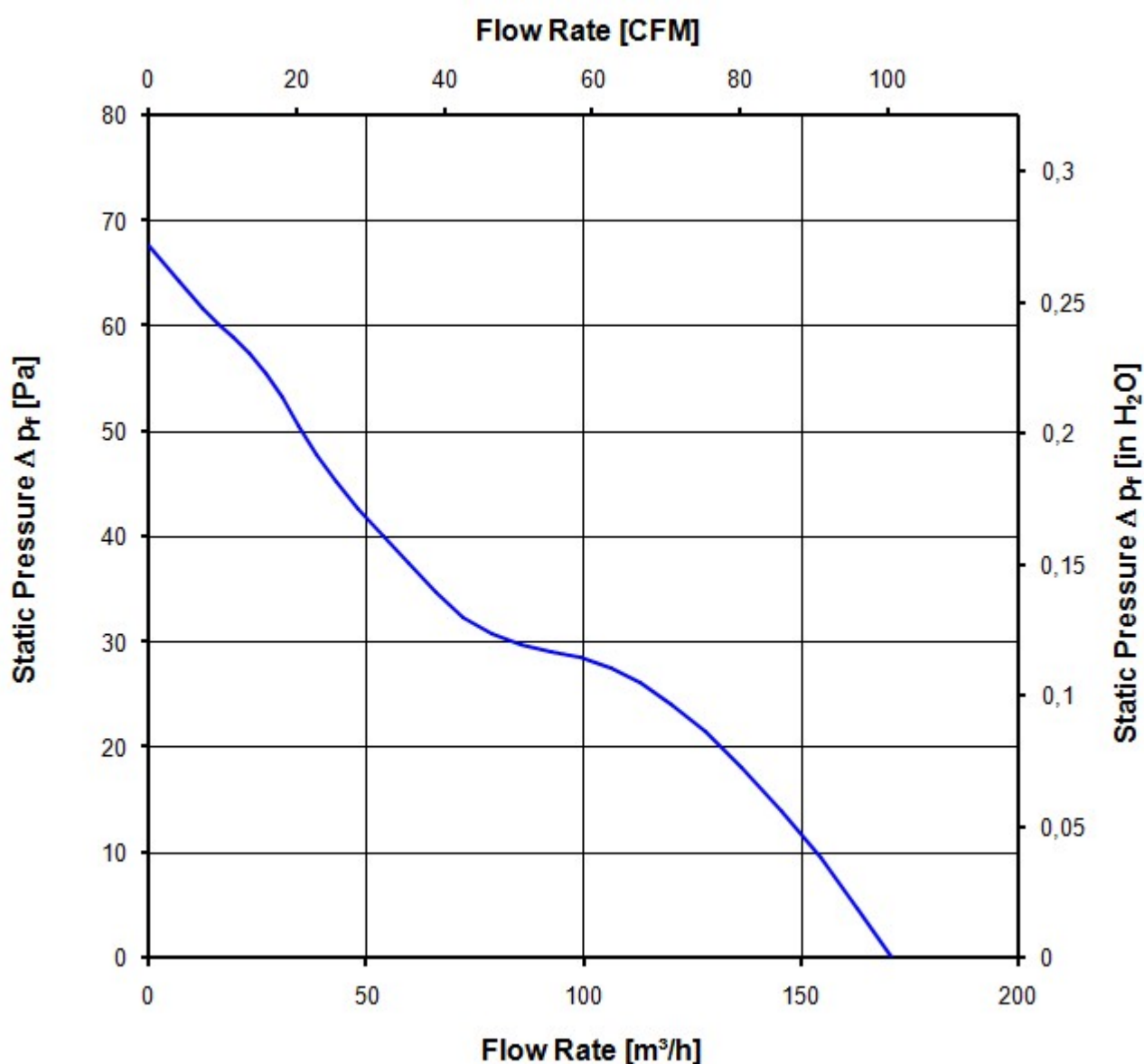
3.5 Aerodynamic

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:

2.900 1/min at free air flow	PWM 100 %;	f: 21 kHz	f: 25 kHz
------------------------------	------------	-----------	-----------

Max. free-air flow ($\Delta p = 0$ / $\dot{V} = \text{max.}$)	168,0 m ³ /h	
Max. static pressure ($\Delta p = \text{max.}$ / $\dot{V} = 0$)	67 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 $L_p(A) < 5 \text{ dB(A)}$
 For further measurement conditions see section 3.5

a.) Operation condition:

2.900 1/min at free air flow	PWM 100 %	PWM min.: ; f: 21 kHz	PWM max.:; f: 25 kHz
------------------------------	-----------	-----------------------	----------------------

Optimal operating point	124,0 m ³ /h @ 19 Pa	
Sound power level at the optimal operating point	5,4 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	43,0 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, 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.

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	No
UL	Yes / UL507, Electric Fans
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.

THE UNIVERSITY OF CHICAGO

Technical drawing of a fan assembly. The drawing shows a fan with a central hub and multiple blades. The central hub is labeled with the diameter $\varnothing 125$. The fan is mounted on a square base. The base has four mounting holes, each with a diameter of $\varnothing 10$. The dimensions of the base are given as 104.8 ± 0.2 (width), 115 (height), and 119 ± 0.3 (depth). The label "abampost" is located in the top left corner.

Technical drawing of a vertical rod with the following dimensions:

- Top diameter: $25.4^{+0.3}$
- Upper section diameter: 4 ± 0.2
- Lower section diameter: 4 ± 0.2
- Bottom diameter: $\varnothing 4.3 \pm 0.15 (8x)$

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		Worksheet/Worksheet:		Volumen/Volume (mm³):	
SIP-Steuer/State	Asset-Id./Change-Id.	Arch/DG-Schema-Version		CAD-Umgebung/ CAD-Environment		Gewicht/Mass (g):	
		Isom./Isol.		Name/Name		Artikel/Title	
		Bezeichnung/Description					
		Gepr./Checked					
Tiefenzeichnung/Depth drawing:		Prüft./Verified					
Allgemeine Informationen/General information				Zeich.-Nr./Drawing-Id.:		Ersf./Drawing Replaces	
ebm-papst St. Georgen GmbH & Co. KG		Document type / Type of Document		Teilnummer/Part-Part		Isom./Isol.	
						Format/Size	
						Isom./Isol.	