Product Data Sheet 4118 N/2H4P-324

ebmpapst

The engineer's choice



GREEN TECH

4118 N/2H4P-324

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1 General

Fan type	Fan	
Rotating direction looking at rotor	Clockwise	
Airflow direction	Air intake over struts	
Bearing system	Ball bearing	
Mounting position - shaft	Any	

2 Mechanics

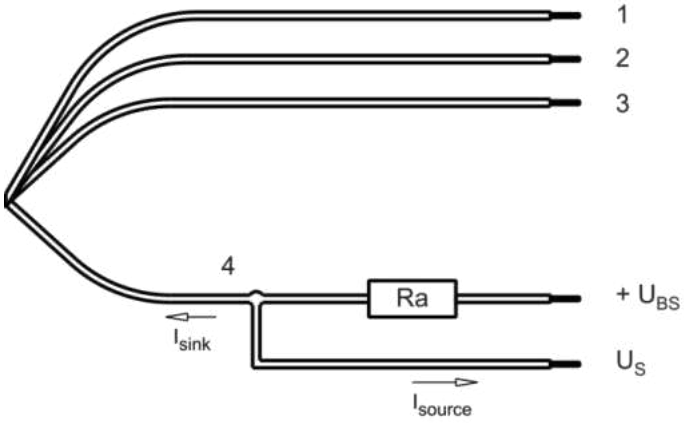
2.1 General

Width	119,0 mm	
Height	119,0 mm	
Depth	38,0 mm	
Mass	0,390 kg	
Housing material	Metal	
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires - Plug	
Lead wire length Tolerance	L = 310 mm +- 10,0 mm	
Plug	See drawing	
Contact	See drawing	





Wire	Color	Operation	Plug connection	Wire size	Insulation diameter
1	red	+ UB	Pin 1	AWG 22	1,7 mm
2	blue	- GND	Pin 2	AWG 22	1,7 mm
3	violet	PWM	Pin 4	AWG 22	1,7 mm
4	white	Tacho	Pin 3	AWG 22	1,7 mm

3 Operating Data

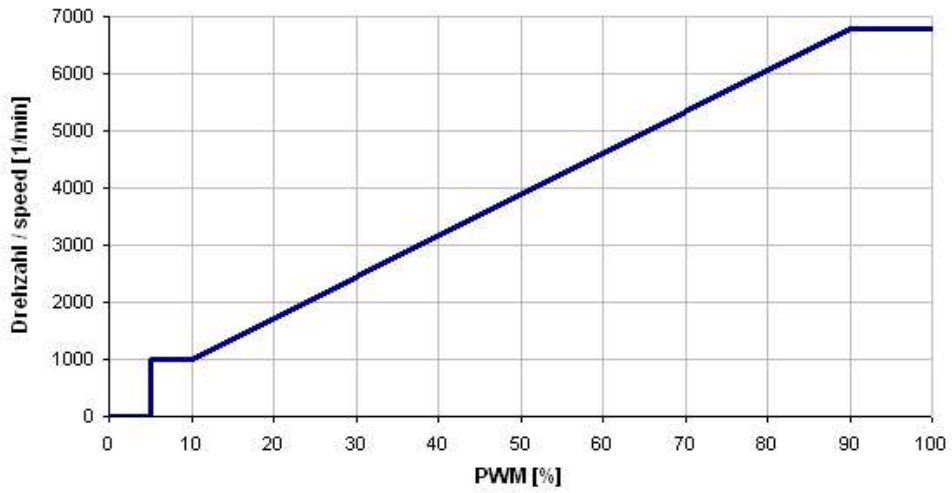
3.1 Electrical Interface - Input

Control input	PWM

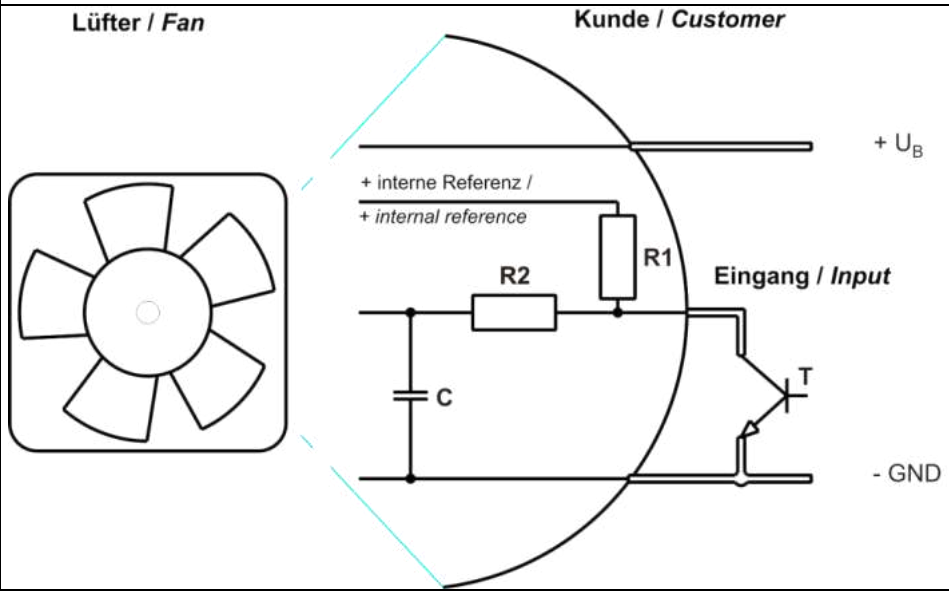
Features

PWM - Frequency		1 kHz - 20 kHz typical: 2 kHz

Characteristics



Schematics



The shown pull-up resistor R1 to the internal reference voltage (+5V) has 4.7kOhm.

Transistor requirements:
VCEmax. >12V
Isink max. >5mA
VCEsat <0,15V

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: > 90 %; f: 2 kHz		

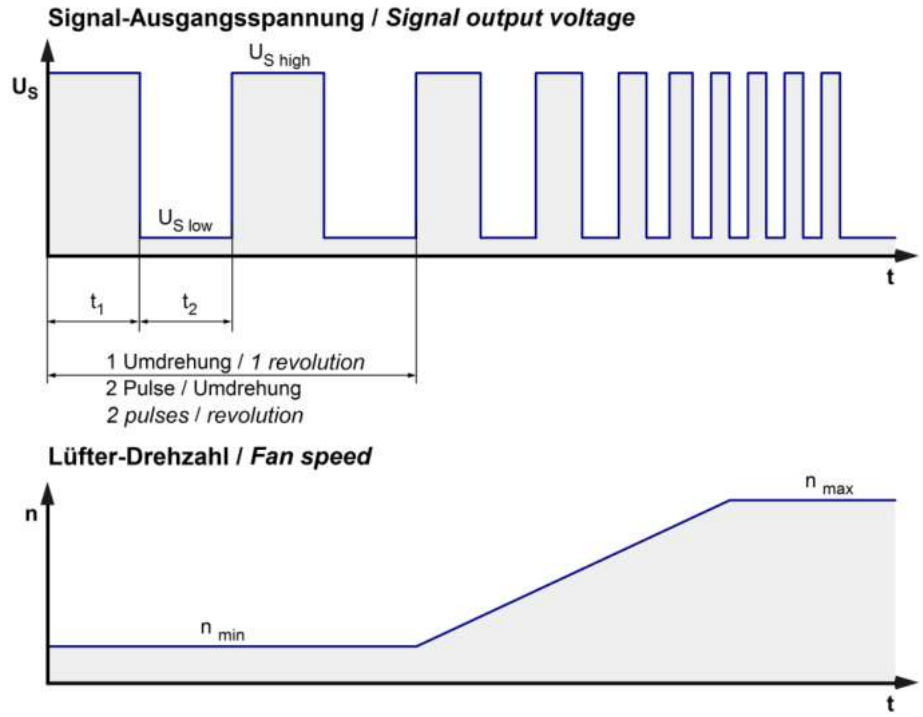
Note:
No inrush current at Unom means:

The internal electrolytic capacitor 39uF/100V has no resistor or inrush current limitation, essentially the power supply and the type and length of the connecting cable is limiting the Inrush current.

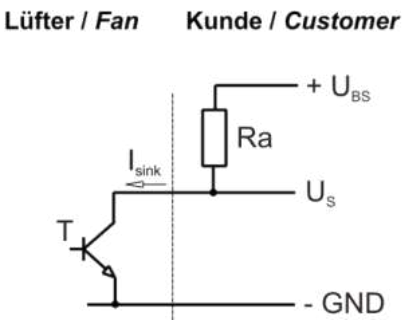
Features	Condition	Symbol	Values		
Voltage range		U	36 V		60 V
Nominal voltage		U_N		48 V	
Power consumption Tolerance	Δp = 0 PWM 0010	P	19,4 W +- 15 %	34 W +- 15 %	35,4 W +- 15 %
Current consumption Tolerance	Δp = 0 PWM 0010	I	540 mA +- 15 %	710 mA +- 15 %	590 mA +- 15 %
Speed Tolerance	Δp = 0 PWM 0010	n	5.900 1/min +- 10 %	6.800 1/min +- 7,5 %	6.800 1/min +- 7,5 %
Starting current consumption				2.200 mA	

3.3 Electrical Interface - Output

Tacho type	/2 (open collector)



$$Ra = \frac{U_{BS} - U_{S\,low}}{I_{sink}}$$

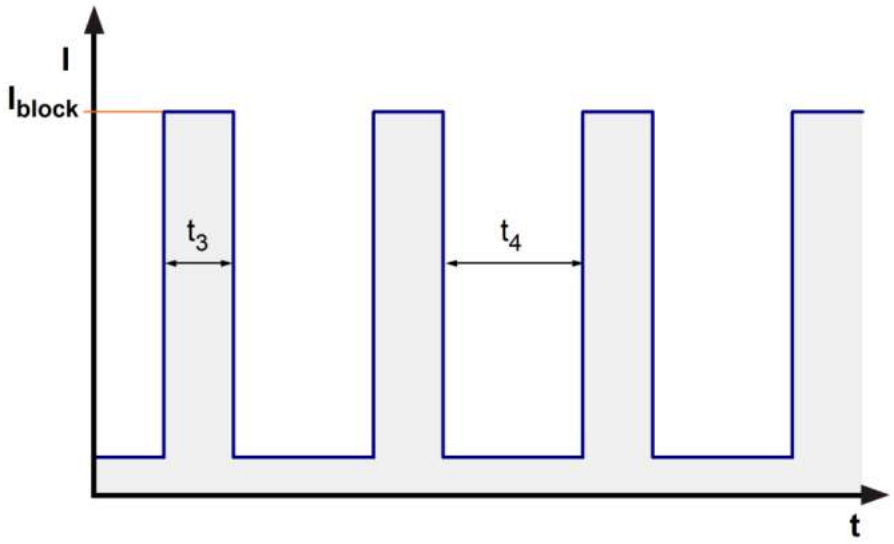


Features		Note	Values
Tacho operating voltage	U_{BS}		<= 60 V
Tacho signal Low	$U_{S\,low}$	I sink: 2 mA	<= 0,4 V
Tacho signal High	$U_{S\,high}$	I source: 0 mA	<=60 V
Maximum sink current	I_{sink}		<= 20 mA
External resistor		External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency		(2 x n) / 60	227 Hz @ 6.800 1/min
Tacho isolated from motor		No	
Slew rate			=> 0,5 V/us

n = revolutions per minute (1/min)

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at U_N	Rectifying diode I_F <= 10 mA	
Locked rotor protection	Auto restart	
Locked rotor current at U_N	I_{block} approx. 1.000 mA	
Clock signal at locked rotor	t_3 / t_4 typical: 0,5 s / 5,0 s	
Internal fuse	Littelfuse NANO2 > Very Fast-Acting > 451/453 Series 4A / 125V (Art.No.: 0451004.MRL)	



Max. current when decelerate at Unom. = < 2.200mA peak

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. 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:

6.800 1/min at free air flow	PWM > 90 %; f: 2 kHz		

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	350 m3/h	
Max. static pressure (Δp = max. / $\dot{V}$ =0)	360 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 chapter aerodynamics.

a.) Operation condition:

6.800 1/min at free air flow	PWM > 90 %; f: 2 kHz		

Optimal operating point	250 m3/h @ 140 Pa	
Sound power level at the optimal operating point	7,4 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	67,0 dB(A)	

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, constant; according to DIN EN 60068-2-78, 14 days	
Water exposure	None	
Dust requirements	None	
Salt fog 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.

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. 850 VDC / 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 / 1,5 mm	
Protection class	III	

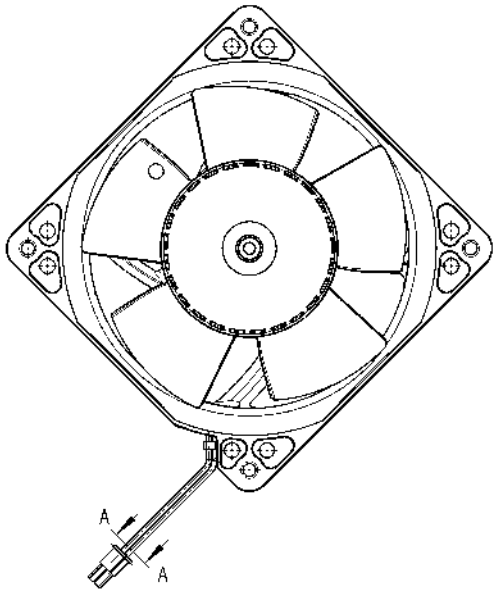
5.2 Approval Tests

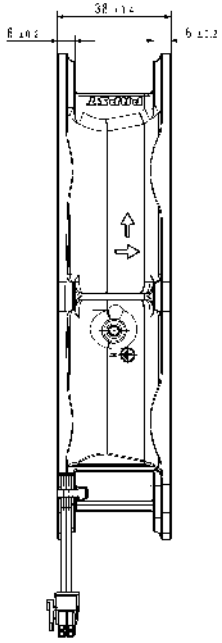
CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Canadian Standards Association	Yes / C22.2 No. 113 Fans and Ventilators
CCC	China Compulsory Certification	Yes / GB 12350 Safety Requirements for small Power Motors

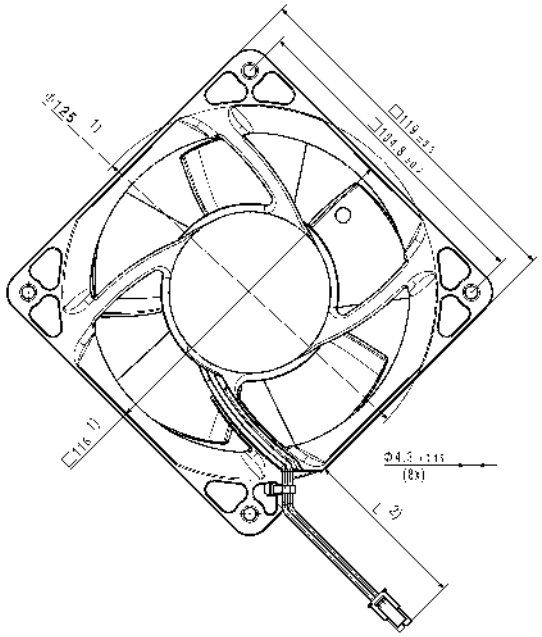
6 Reliability

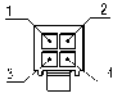
6.1 General

Life expectancy L10 at TU = 40 °C	62.500 h	
Life expectancy L10 at TU max.	35.000 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	105.000 h	









A-A 2:1

1x Steckergehäuse
Lieferant: Molex
Best.-Nr.: 43025-0400

1x plughousing
supplier: Molex
Order No.: 43025-0400

4x Kontakt
lieferant: Molex
Best.-Nr.: 43030-003

4x contact
supplier: Molex
Order No.: 43030-003

PIN	colour / signal
1	rot / red -48V
2	blau / blue GND
3	weiß / white TACHO
4	violett / violet PWM

1) Maße für Montageausschnitt
2) Anzahl und Länge der Litzen siehe BV Blatt 1
- Axialspiel der Kugellager mit Federspiel frei verspannt

1) measures for mounting cut-out
2) length and number of wires see design specification page 1
- ball bearing without axial clearance by a pre-loaded spring

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