

4118 N/2H7P

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6.1 General 10

1 General

Fan type	Fan	
Rotational direction looking at rotor	clockwise	
Airflow direction	Air intake over struts	
Bearing system	Ball bearing	
Mounting position	any	

2 Mechanics

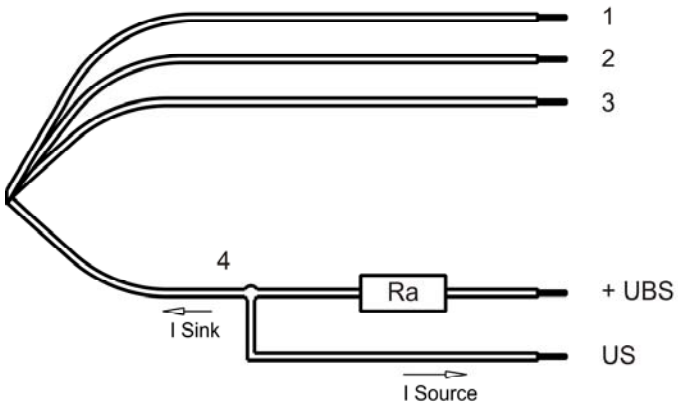
2.1 General

Width	119,0 mm	
Height	119,0 mm	
Depth	38,0 mm	
Weight	0,425 kg	
Housing material	Metal	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges Screw size	wire outlet corner: 420 Ncm remaining corners: 600 Ncm ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

Electrical connection	Wires		
Length of lead wire Tolerance	310 mm +- 10,0 mm		
Wire gauge (AWG)	20	22	
Insulation diameter	1,70 mm	2,05 mm	





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

The auxilliaries shown on the schematic diagram (which are required for the intended use) are not part of our delivery.

Lead wire 1 - 2: AWG20 (Insulation diameter 2,05mm)
Lead wire 3 - 4: AWG22

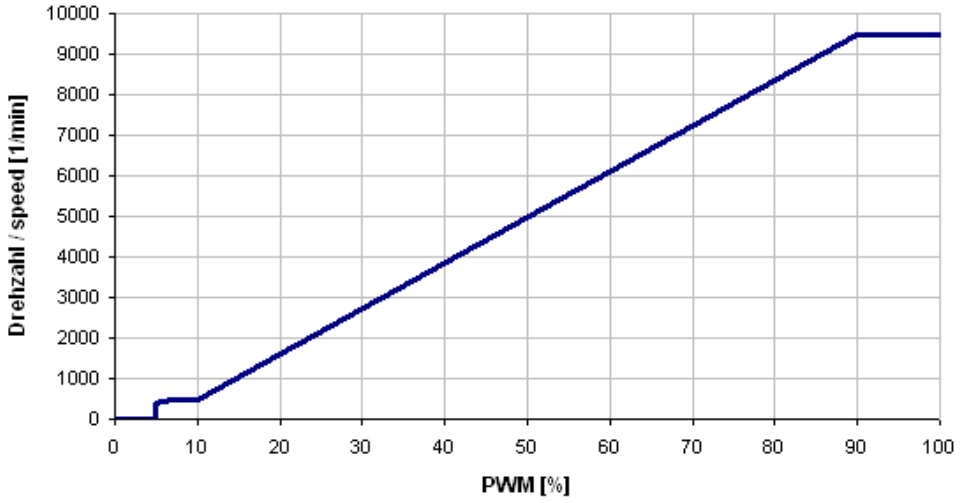
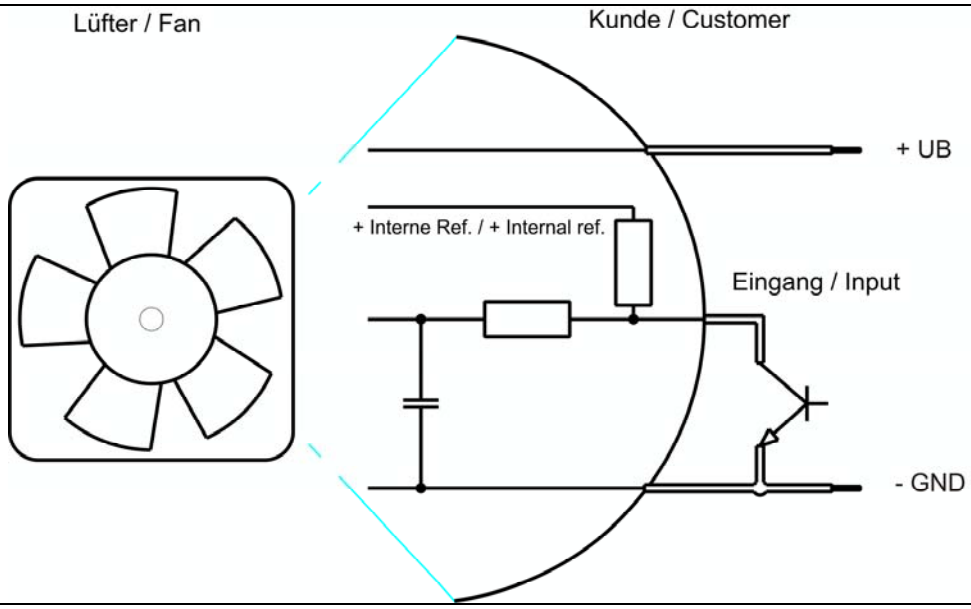
3 Operating Data

3.1 Operating Data - Electrical Interface - Input

Control input	PWM

Features

Inpute type	Open collector	
PWM - Frequency		1 kHz - 20 kHz

Characteristics	
Schematics	

Speed control:
PWM = 0...100 %; f = 1...20 kHz; n = 500...9500 1/min

Alternatively to the PWM signal the fan can be controlled by an analog control signal of 0...5 V (5 V corresponds to 100 % PWM).It must be ensured that the power supply is "sink-able" and can operate with the internal pull-up resistor (10kOhm).

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: 95 %; f: 2 kHz		

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	36,0 V		60,0 V
Nominal voltage	$\Delta p = 0$	U_N		48,0 V	
Power consumption Tolerance	$\Delta p = 0$ PWM 0001	P	53,0 W +- 12,5 %	80,0 W +- 10,0 %	82,0 W +- 10,0 %
Current consumption Tolerance	$\Delta p = 0$ PWM 0001	I	1.450 mA +- 12,5 %	1.670 mA +- 10,0 %	1.370 mA +- 10,0 %
Speed Tolerance	$\Delta p = 0$ PWM 0001	n	8.300 1/min +- 7,5 %	9.500 1/min +- 5,0 %	9.500 1/min +- 5,0 %

Attention!

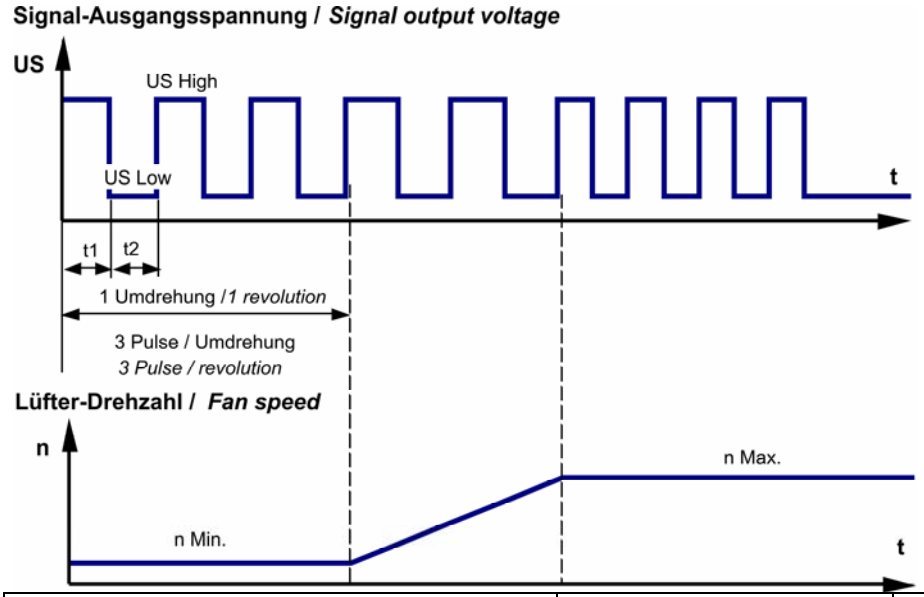
The inrush current depends on the capacitor and the resistance of the wires. When using an external capacitor the inrush current rises accordingly. The integrated capacitor has 47uF.

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

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	36,0 V		60,0 V
Nominal voltage	$\Delta p = 0$	U_N		48,0 V	
Power consumption Tolerance	$\Delta p = 0$ PWM 0002	P	0,3 W +- 20,0 %	0,4 W +- 20,0 %	0,6 W +- 20,0 %
Current consumption Tolerance	$\Delta p = 0$ PWM 0002	I	8 mA +- 20,0 %	9 mA +- 20,0 %	9 mA +- 20,0 %
Speed Tolerance	$\Delta p = 0$ PWM 0002	n	0 1/min	0 1/min	0 1/min

3.3 Operating Data - Electrical Interface -Output

Tacho type	/2 (Open collector)



$$Ra = \frac{UBS - US\ Low}{I\ Sink}$$

Features	Note	Values
Tacho operating voltage (UBS)		<= 60 V
Tacho signal Low	I sink: 2 mA	<= 0,4 V
Tacho signal High	I source: 0 mA	<= 60 V
Maximum sink current		<= 20 mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency	(3 x n) / 60	
Tacho isolated from motor	No	
Slew rate		=> 0,5 V/us

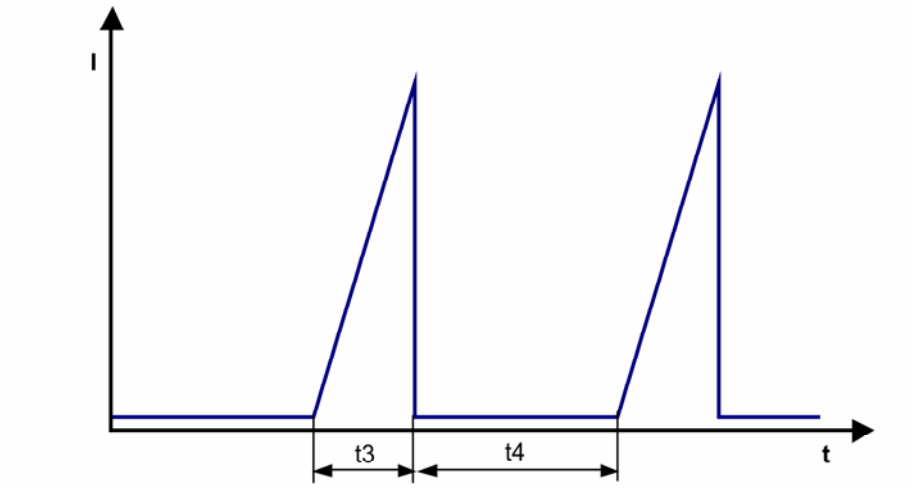
Note to the tacho frequency: 3 Pulses per revolution.

When the fan starts up or the rotor is locked the tacho is off. After a successful start-up the tacho output signal turns on.

Alarm type	None

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at Un	N-CH FET IF <= 1 mA	
Locked rotor protection	Auto restart	
Locked rotor current at Un	approx. 1.800 mA	
Clock signal t3/t4 at locked rotor	Typical: 1,8 s / 5,2 s t3: 1,6 s... 2,0 s t4: 5,0 s... 5,4 s	



Internal Fuse:

Littelfuse Nano2 Fuse
Very Fast-Acting 451/453 Series
5A / 125V

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:

9.500 1/min at free air flow	PWM 95 %; f: 2 kHz		

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	475,0 m3/h	
Max. static pressure (Δp = max. / $\dot{V}$ =0)	980 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:

9.500 1/min at free air flow	PWM 95 %; f: 2 kHz	PWM min.:	PWM max.:

Optimal operating point	340,0 m3/h @ 328 Pa	
Sound power level at the optimal operating point	8,4 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	74,0 dB(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	75 °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	

*) Permittet 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	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	Yes / C22.2 No. 113 Fans and Ventilators
CCC	Yes / GB 12350 Safety Requirements for small Power Motors

The approval tests are observed to:
U approval max.:60,0 V @ TU approval max.: 75,0 °C

6 Reliability

6.1 General

Attention!
In order to achieve the specified life time figure, it is necessary to connect an external capacitor.

Complexity, connection, components and configuration must be checked at the project.

As a basis a capacitor of 220...1000 uF connected to the supply voltage between plus and minus can be used. Max. suggested lead length between fan and capacitor: 300 mm.

Life expectancy L10 at TU = 40 °C	57.500 h	
Life expectancy L10 at TU max.	25.000 h	
Life expectancy L10 Delta (40 °C)	115.000 h	