



The engineer's choice

**ebmpapst**

4118 NH5P-277

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 Aerodynamic ..... 7

3.6 Sound Data ..... 8

**4 Environment ..... 8**

4.1 General ..... 8

4.2 Climatic requirements\*) ..... 8

**5 Safety ..... 9**

5.1 Electrical Safety ..... 9

5.2 Approval Tests ..... 9

**6 Reliability ..... 9**

6.1 General ..... 9

## 1 General

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

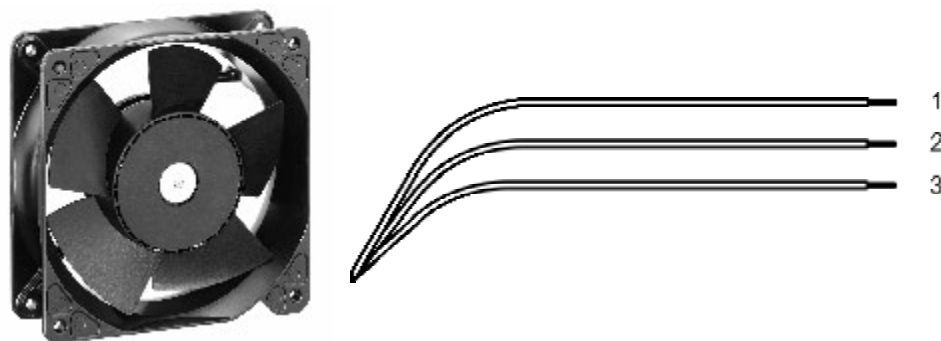
## 2 Mechanics

### 2.1 General

Width	119,0 mm	
Height	119,0 mm	
Depth	38,0 mm	
Weight	0,390 kg	
Housing material	Metal	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	wire outlet corner: 420 Ncm remaining corners: 600 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	L = 55 mm	
Tolerance	+/- 5,0 mm	
Wire gauge (AWG)	22	
Insulation diameter	1,70 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

Input type	Open collector
------------	----------------

<b>Characteristics</b>	<table border="1" style="margin: 10px auto;"> <caption>Approximate data from the speed vs PWM graph</caption> <thead> <tr> <th>PWM [%]</th> <th>Speed [1/min]</th> </tr> </thead> <tbody> <tr><td>0</td><td>1000</td></tr> <tr><td>10</td><td>1500</td></tr> <tr><td>20</td><td>2000</td></tr> <tr><td>30</td><td>2500</td></tr> <tr><td>40</td><td>3000</td></tr> <tr><td>50</td><td>3500</td></tr> <tr><td>60</td><td>4000</td></tr> <tr><td>70</td><td>4500</td></tr> <tr><td>80</td><td>5000</td></tr> <tr><td>90</td><td>5500</td></tr> <tr><td>95</td><td>7500</td></tr> <tr><td>100</td><td>7500</td></tr> </tbody> </table>	PWM [%]	Speed [1/min]	0	1000	10	1500	20	2000	30	2500	40	3000	50	3500	60	4000	70	4500	80	5000	90	5500	95	7500	100	7500
PWM [%]	Speed [1/min]																										
0	1000																										
10	1500																										
20	2000																										
30	2500																										
40	3000																										
50	3500																										
60	4000																										
70	4500																										
80	5000																										
90	5500																										
95	7500																										
100	7500																										
<b>Schematics</b>	<p style="text-align: center;">Lüfter / Fan                      Kunde / Customer</p>																										

### 3.2 Electrical Operating Data

Measurement conditions: Normal air density = 1,2 kg/m<sup>3</sup>; 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: 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	$\Delta p = 0$	P	24,0 W	42,0 W	44,0 W
Tolerance	PWM 0001		+/- 15,0 %	+/- 10,0 %	+/- 10,0 %
Current consumption	$\Delta p = 0$	I	665 mA	875 mA	730 mA
Tolerance	PWM 0001		+/- 15,0 %	+/- 10,0 %	+/- 10,0 %
Speed	$\Delta p = 0$	n	6.200 1/min	7.500 1/min	7.500 1/min
Tolerance	PWM 0001		+/- 10,0 %	+/- 10,0 %	+/- 10,0 %
Starting current consumption				1.600 mA	
Inrush current				60.000 mA	

Name	Condition
PWM 0002	PWM: 50 %; 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 V	
Power consumption	$\Delta p = 0$	P	9,5 W	10,1 W	11,1 W
Tolerance	PWM 0002		+/- 15,0 %	+/- 10,0 %	+/- 10,0 %
Current consumption	$\Delta p = 0$	I	265 mA	210 mA	185 mA
Tolerance	PWM 0002		+/- 15,0 %	+/- 10,0 %	+/- 10,0 %
Speed	$\Delta p = 0$	n	4.200 1/min	4.200 1/min	4.200 1/min
Tolerance	PWM 0002		+/- 10,0 %	+/- 10,0 %	+/- 10,0 %

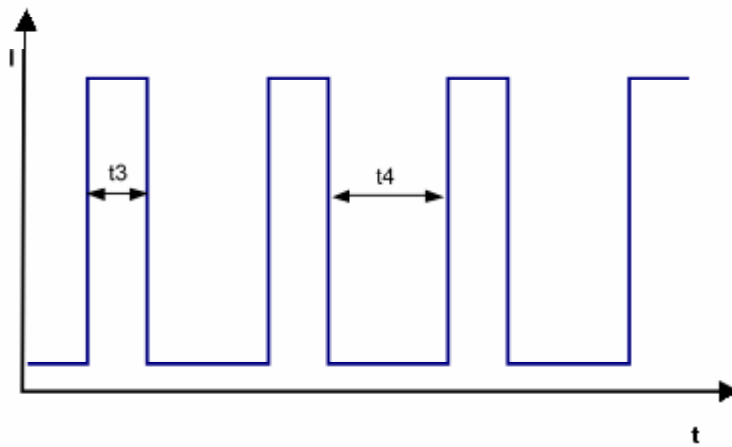
### 3.3 Operating Data - Electrical Interface -Output

Tacho type	None
------------	------

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

### 3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection	Rectifying diode	
Max. residual current at Un	IF ≤ 10 mA	
Locked rotor protection	Auto restart	
Locked rotor current at Un	approx. 2.300 mA	
Clock signal t3/t4 at locked rotor	Typical: 0,5 s / 5,0 s t3: 0,4 s... 0,6 s t4: 4,8 s... 5,2 s	



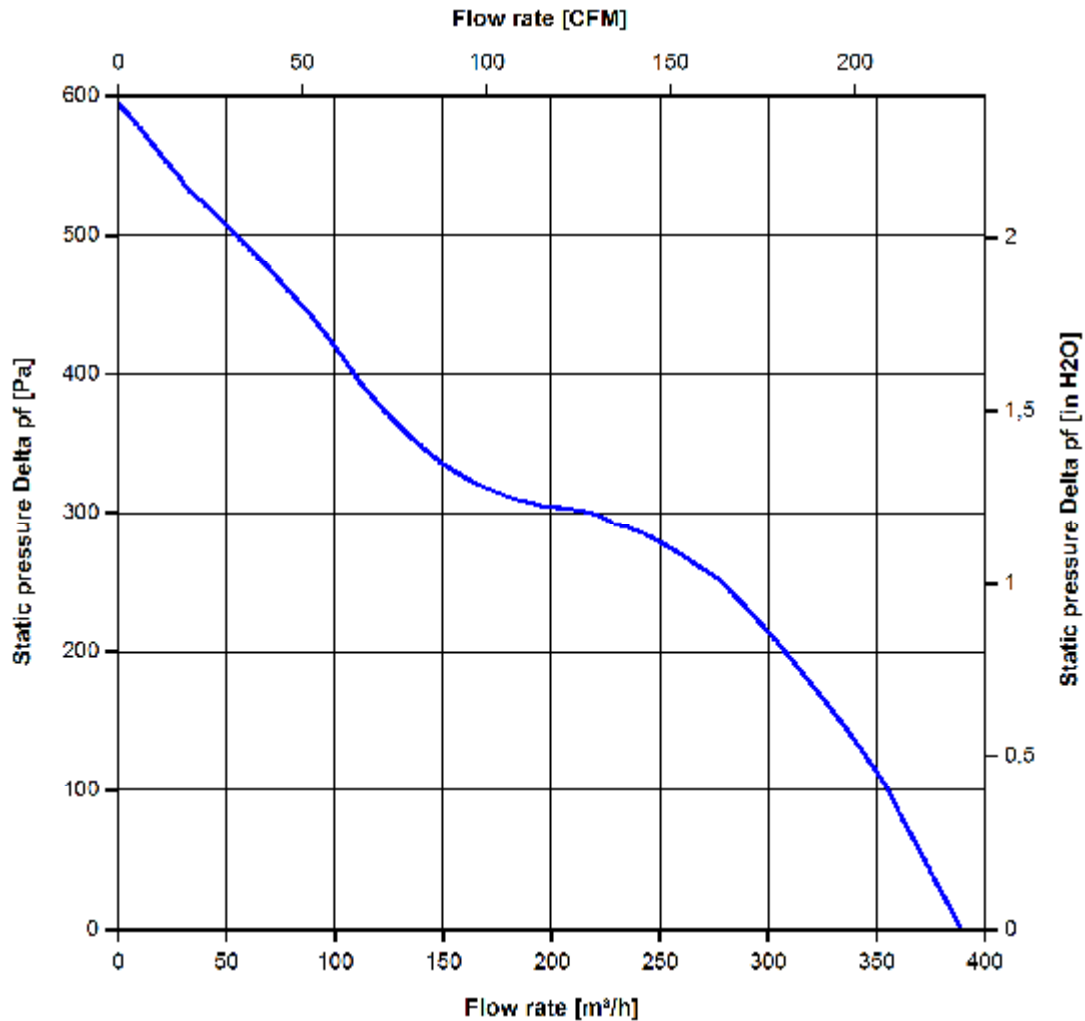
### 3.5 Aerodynamic

Measurement conditions: Measured with a double chamber intake rig acc. to DIN EN ISO 5801.  
 Normal air density = 1,2 kg/m<sup>3</sup>; 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:

7.500 1/min at free air flow	PWM 100 %; f: 2 kHz		
------------------------------	---------------------	--	--

Max. free-air flow ( $\Delta p = 0 / \dot{V} = \text{max.}$ )	390,0 m <sup>3</sup> /h
---	-------------------------



### 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:

7.500 1/min at free air flow	PWM 100 %; f: 2 kHz	PWM min.:	PWM max.:
------------------------------	---------------------	-----------	-----------

Optimal operating point	297,0 m3/h @ 193 Pa	
Sound power level at the optimal operating point	7,7 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	70,0 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.	500 VAC / 1 Min.	
B.) Routine test Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All connections together to ground.	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 / 1,5 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.: 65,0 °C

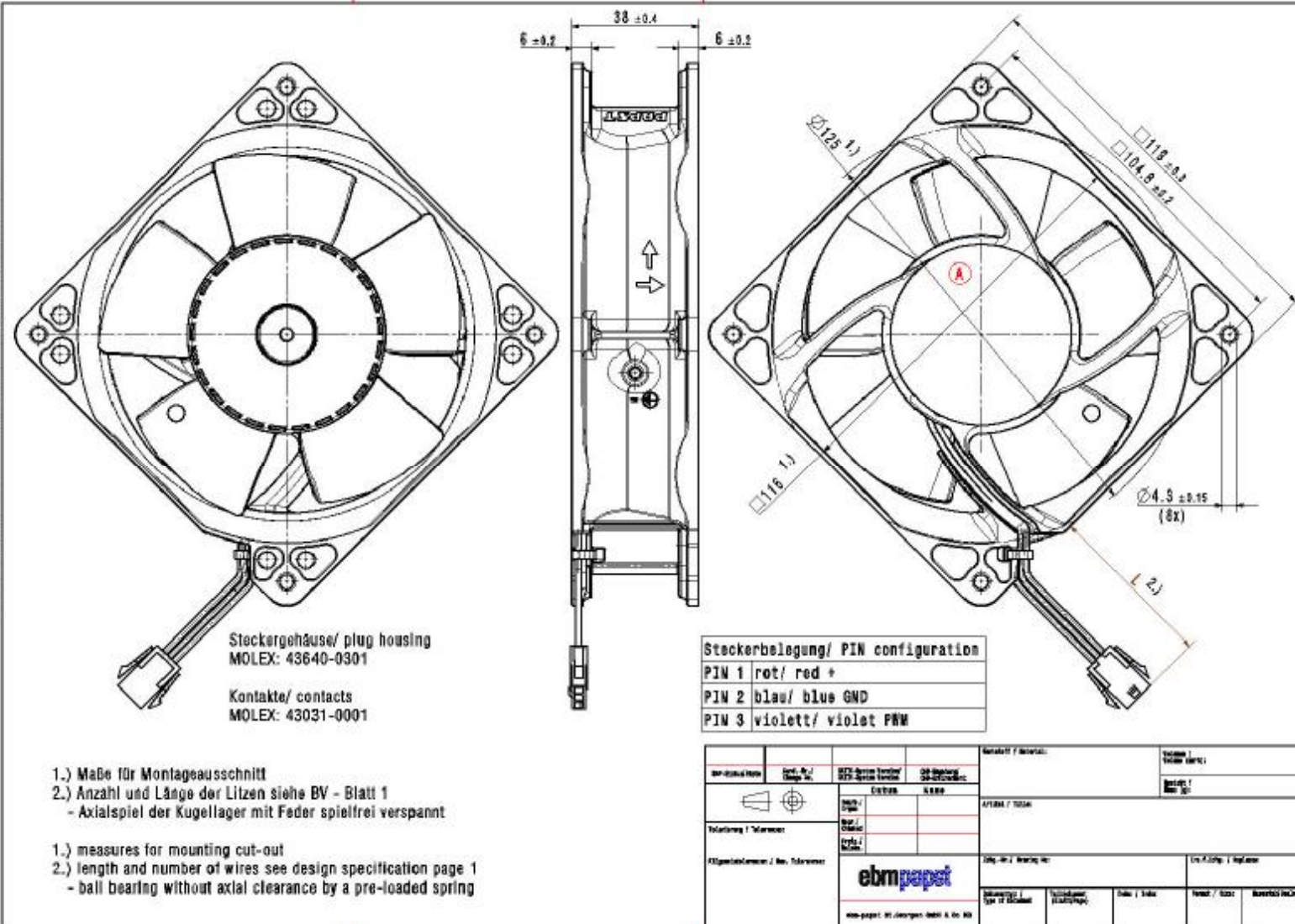
## 6 Reliability

### 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 Delta (40 °C)	125.000 h	

Copies of this manual, or parts of it, may not be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without the prior written permission of the manufacturer. All rights are reserved.

Measurements and tolerances are given in millimeters unless otherwise specified.



Steckergehäuse/ plug housing  
 MOLEX: 43640-0301  
 Kontakte/ contacts  
 MOLEX: 43031-0001

Steckerbelegung/ PIN configuration	
PIN 1	rot/ red +
PIN 2	blau/ blue GND
PIN 3	violett/ violet PWM

- 1.) Maße für Montageausschnitt
  - 2.) Anzahl und Länge der Litzen siehe BV - Blatt 1  
- Axialspiel der Kugellager mit Feder spielfrei 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

Zeichnungs-Nr. 		Stück / Qty Stück / Qty Stück / Qty		Material / Material: Name / Name: Bezeichnung / Ref. No.	
Fertigung / Fabrication: Fertigung / Fabrication: Fertigung / Fabrication:		Datum / Date Datum / Date Datum / Date		AP/BAW / TOTAL AP/BAW / TOTAL AP/BAW / TOTAL	
Fertigungs-Kennzeichen / No. Fabrication: 		Fertigung / Fabrication: Fertigung / Fabrication: Fertigung / Fabrication:		Fertigung / Fabrication: Fertigung / Fabrication: Fertigung / Fabrication:	
Fertigung / Fabrication: Fertigung / Fabrication: Fertigung / Fabrication:		Fertigung / Fabrication: Fertigung / Fabrication: Fertigung / Fabrication:		Fertigung / Fabrication: Fertigung / Fabrication: Fertigung / Fabrication:	