



The engineer's choice

ebmpapst

4114 N/2H3U

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	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
6	Reliability.....	10
6.1	General	10

1 General

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

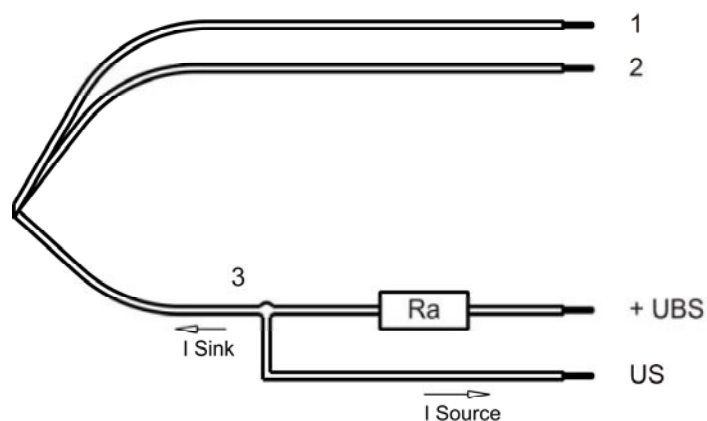
2 Mechanics

2.1 General

Width	119,0 mm	
Height	119,0 mm	
Depth	38,0 mm	
Weight		
Housing material	Metal	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	wire outlet corner: 420 Ncm remaining corners: 560 Ncm	
Screw size	ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

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



	Colour	Operation
Wire 1	red	+ UB
Wire 2	blue	- GND
Wire 3	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	None
---------------	------

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

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	16,0 V		30,0 V
Nominal voltage	$\Delta p = 0$	U_N		24,0 V	
Power consumption	$\Delta p = 0$	P	7,5 W	19,5 W	20,4 W
Tolerance	0001		+/- 15,0 %	+/- 15,0 %	+/- 15,0 %
Current consumption	$\Delta p = 0$	I	650 mA	810 mA	680 mA
Tolerance	0001		+/- 15,0 %	+/- 15,0 %	+/- 15,0 %
Speed	$\Delta p = 0$	n	4.200 1/min	6.000 1/min	6.000 1/min
Tolerance	0001		+/- 10,0 %	+/- 10,0 %	+/- 10,0 %
Starting current consumption				3.300 mA	

Note:

No inrush current at U_{nom} means:

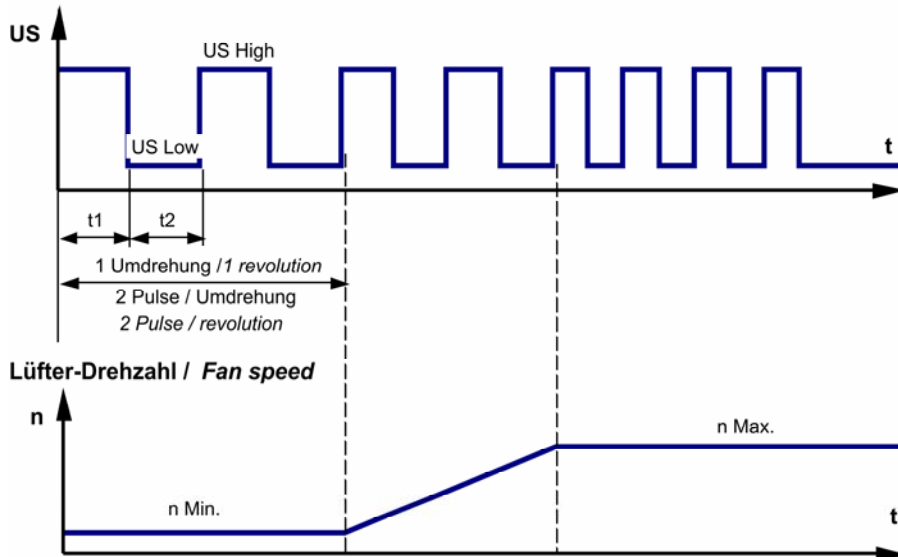
The internal electrolytic capacitor 120uF/50V has no resistor or inrush current limitation, essentially the type and length of the connecting cable is limiting the Inrush current.

3.3 Operating Data - Electrical Interface -Output

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

Signal-Ausgangsspannung / Signal output voltage

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

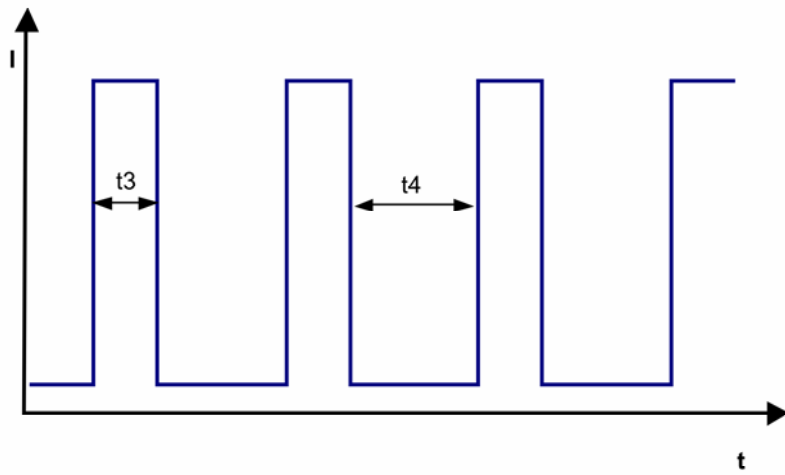


Features	Note	Values
Tacho operating voltage (UBS)		Min.: 5 V Max.: 60 V
Tacho signal Low	I sink: 2 mA	$\leq 0,4 \text{ V}$
Tacho signal High	I source: 0 mA	$\leq 60 \text{ V}$
Maximum sink current		$\leq 10 \text{ mA}$
External resistor	External resistor R_a from UBS to US required. All voltages measured to GND.	
Tacho frequency	$(2 \times n) / 60$	
Tacho isolated from motor	No	
Slew rate		$\Rightarrow 0,5 \text{ V/us}$

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

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection	Rectifying diode	
Max. residual current at U_n	$I_F \leq 10 \text{ mA}$	
Locked rotor protection	Auto restart	
Locked rotor current at U_n	approx. 3.300 mA	
Clock signal t_3/t_4 at locked rotor	Typical: 1,2 s / 5,0 s	

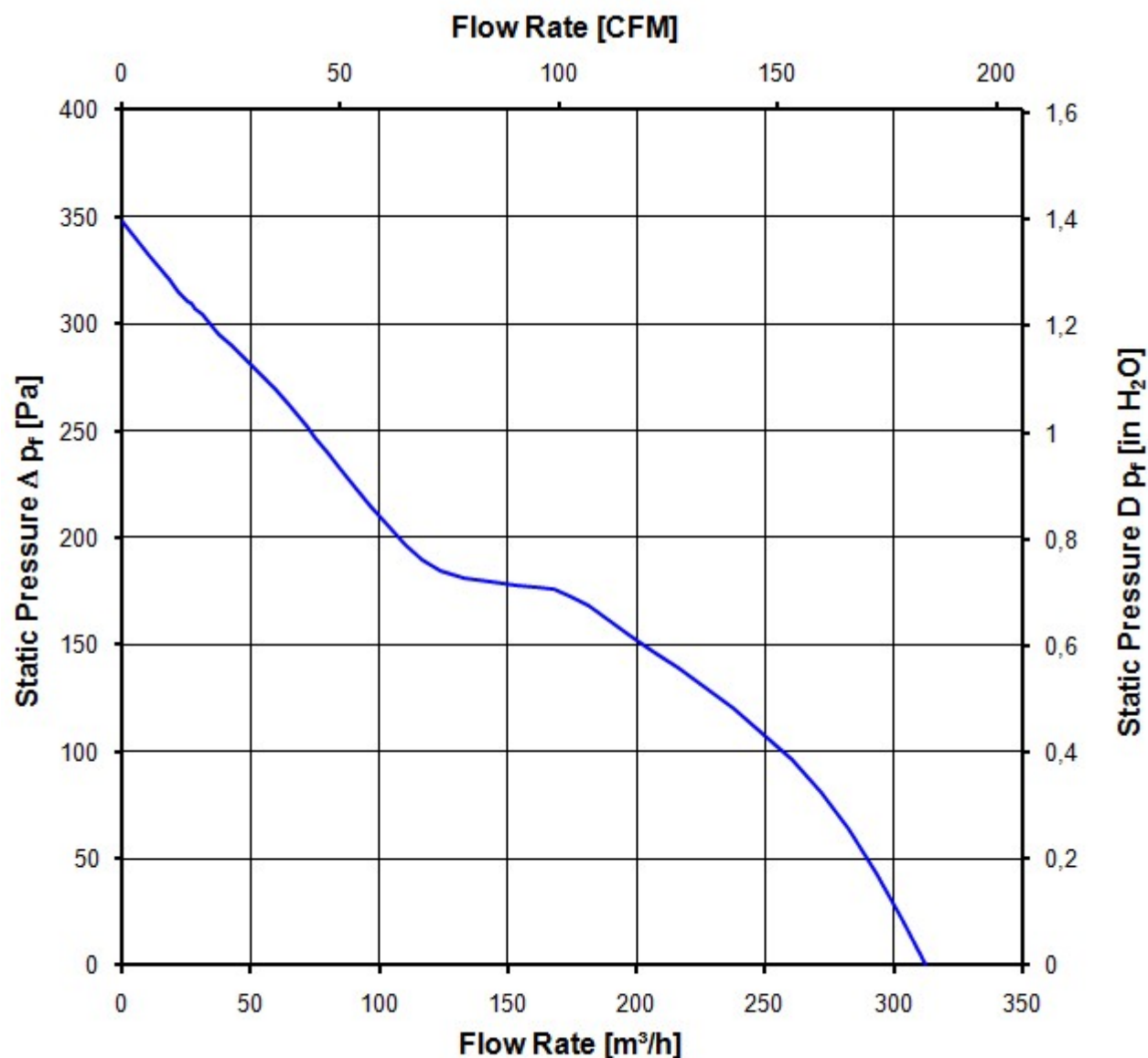


3.5 Aerodynamic

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:

6.000 1/min at free air flow		
Max. free-air flow ($\Delta p = 0$ / $\dot{V} = \text{max.}$)	310,0 m ³ /h	
Max. static pressure ($\Delta p = \text{max.}$ / $\dot{V} = 0$)	350 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:

6.000 1/min at free air flow		
Optimal operating point	240,0 m ³ /h @ 107 Pa	
Sound power level at the optimal operating point	7,1 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	64,0 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 temperature, cyclic; according to DIN EN 60068-2-38, 10 cycle and condensation water check; according to DIN EN ISO 6270-2, 14 days	
Water exposure	Splash water check IPX4; according to DIN EN 60529 VDE 0470, not certified	
Radiation exposure	Solar radiation; according to DIN EN 60068-2-5	
Dust requirements	Dust check IP5X; according to DIN EN 60529 VDE 0470, not certified	
Salt fog requirements	salt fog, cyclic, in operation; according to DIN EN 60068-2-52, 3 cycle	
Harmful gas requirements	Mixed gas corrosion test; according to DIN EN 60068-2-60	

*) Permitted application area:

The product is for the use in open and unsheltered areas. Direct exposure to water as well as saline ambient conditions are allowed provided that this does not prevent the normal operation. Pollution degree 3 (according DIN EN 60664-1)

It occurs conductive pollution or dry non-conductive pollution which becomes conductive due to condensation.

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	Yes
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	No

The approval tests are observed to:

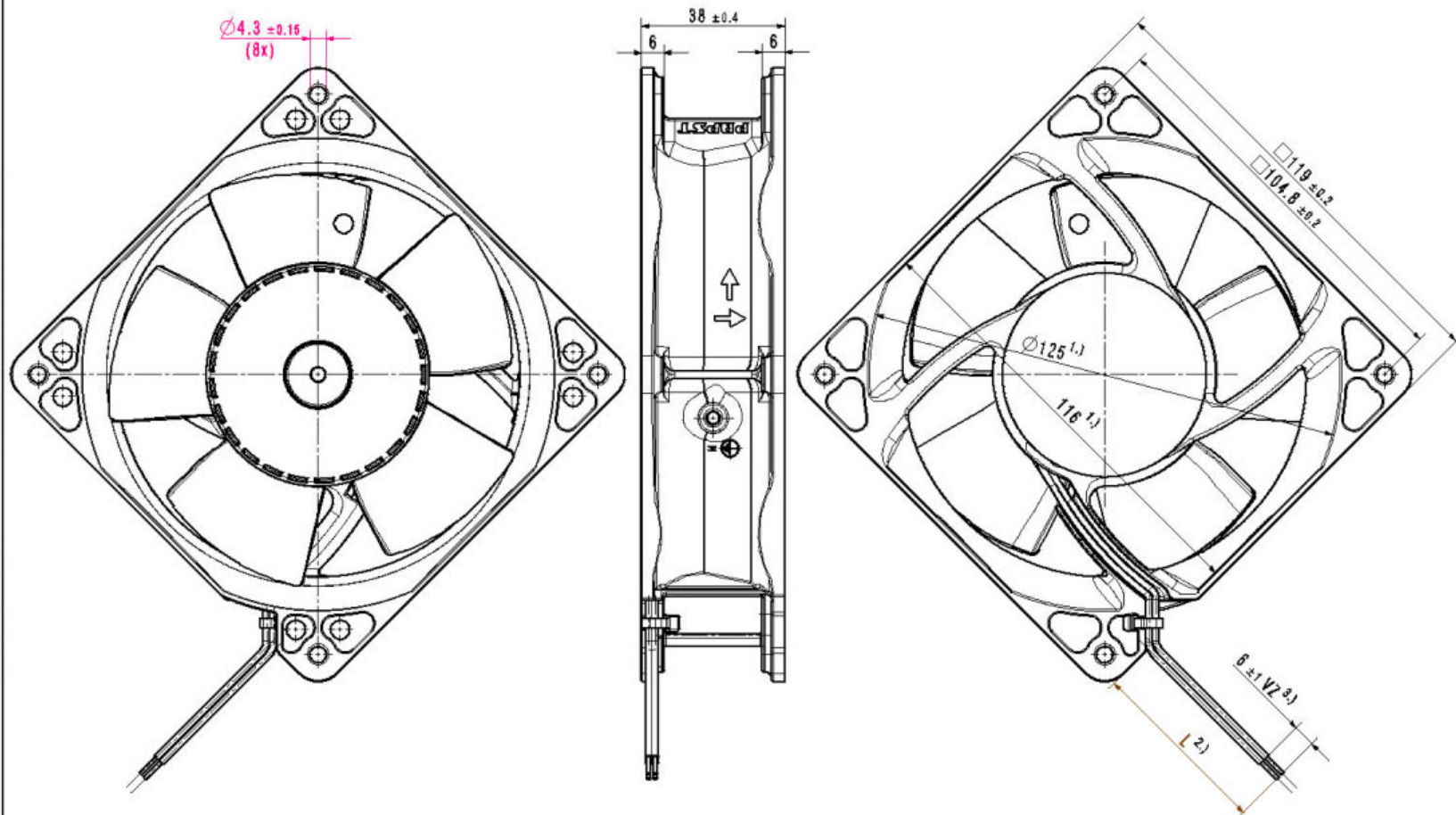
U approval max.: 30,0 V @ TU approval max.: 65,0 °C

6 Reliability

6.1 General

Life expectancy L10 at TU = 40 °C	65.000 h	
Life expectancy L10 at TU max.	37.500 h	
Life expectancy L10 Delta (40 °C)	132.500 h	

Schutzmarkt nach DIN 1024 besetzen. Dieser ist weiterhin nach DIN 1024 zu besetzen.



- 1.) Maße für Montageausschnitt
measures for mounting cut-out
- 2.) Litzen auf Maß kürzen, Länge der Litzen siehe Produktspezifikation
wires cutting to length, wires length see design specification
- 3.) verzinkt
tin plated

- Axialspiel bei Kugellagerung (K) : 0 (durch Federausgleich)
axial clearance by ball bearing (K) = 0 (by a pre-loaded spring)

[illegible]