Product Data Sheet #DV4114 NPU-220

ebmpapst

The engineer's choice



GREEN TECH

#DV4114 NPU-220

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1 General

Fan type	Mixed-flow fan	
Rotating direction looking at rotor	Counterclockwise	
Airflow direction	Air outlet over struts	
Bearing system	Stainless steel bearing	
Mounting position - shaft	Any	

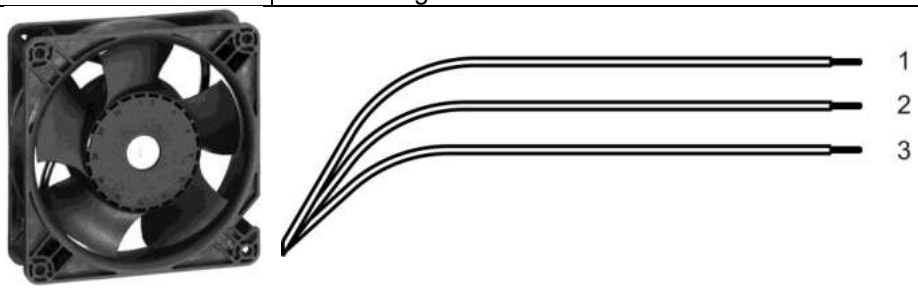
2 Mechanics

2.1 General

Width	119,0 mm	
Height	119,0 mm	
Depth	38,0 mm	
Mass	0,525 kg	
Housing material	Metal	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges Screw size	wire outlet corner: 240 Ncm remaining corners: 420 Ncm ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

Electrical connection	Cable - Plug	
Lead wire length Tolerance	L = 145,0 mm +- 10,0 mm	
Wire size (AWG)	22	
Insulation diameter	1,3 mm	
Contact	See drawing	



Wire	Colour	Operation	plug connection
1	white	+ UB	Pin 3
2	green	- GND	Pin 1
3	brown	PWM	Pin 2

3 Operating Data

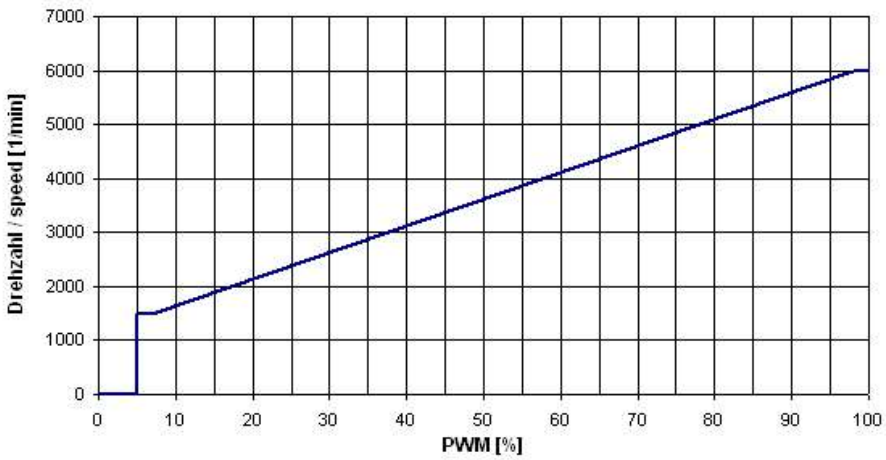
3.1 Operating Data - Electrical Interface - Input

Control input	PWM

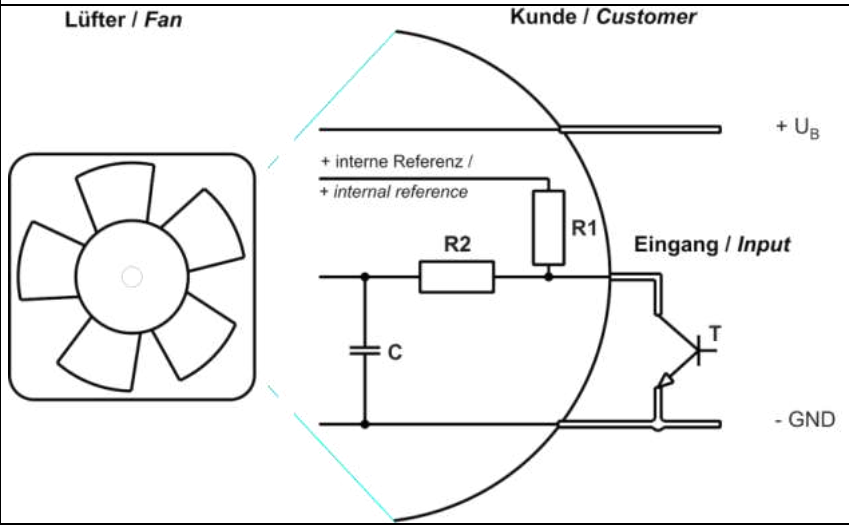
Features

Inpute type	Open collector	
PWM - Frequency		Typical: 50 Hz

Characteristics



Schematics



Speed control: 0...100 % PWM; 5 V pull-up, max 2 mA

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 section 3.5)
I: corresp. to arithm. mean current value

Name	Condition		
PWM 0001	PWM: 100 %;		

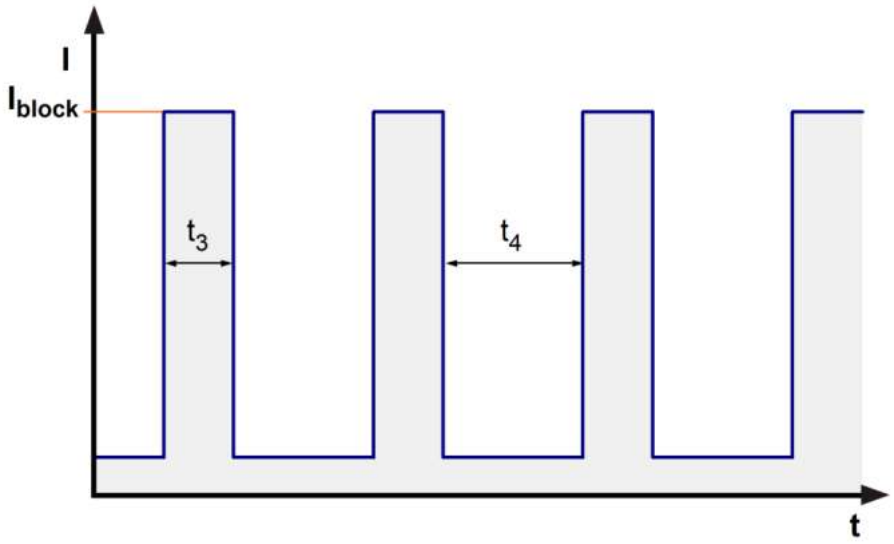
Note:
No inrush current at Unom means:

The internal electrolytic capacitor 120uF/50V 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.
PWM frequenz power stage : 22 kHz

Features	Condition	Symbol	Values		
Voltage range		U	20 V		28,0 V
Nominal voltage		U_N		24,0 V	
Power consumption Tolerance	Δp = 0 PWM 0010	P	17,5 W +- 15 %	21,5 W +- 15,0 %	21,5 W +- 15,0 %
Current consumption Tolerance	Δp = 0 PWM 0010	I	875 mA +- 15,0 %	900 mA +- 15,0 %	765 mA +- 15,0 %
Speed Tolerance	Δp = 0 PWM 0010	n	5.600 1/min +- 10,0 %	6.000 1/min +- 10,0 %	6.000 1/min +- 10,0 %

3.3 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. 800 mA	
Clock signal at locked rotor	t_3 / t_4 Typical: 0,5 s / 5,0 s	



Internal Fuse:
Littlefuse NANO2(R) FUSE; Very fast acting 451 Series; 3 A (Art.-Nr.: 451003)

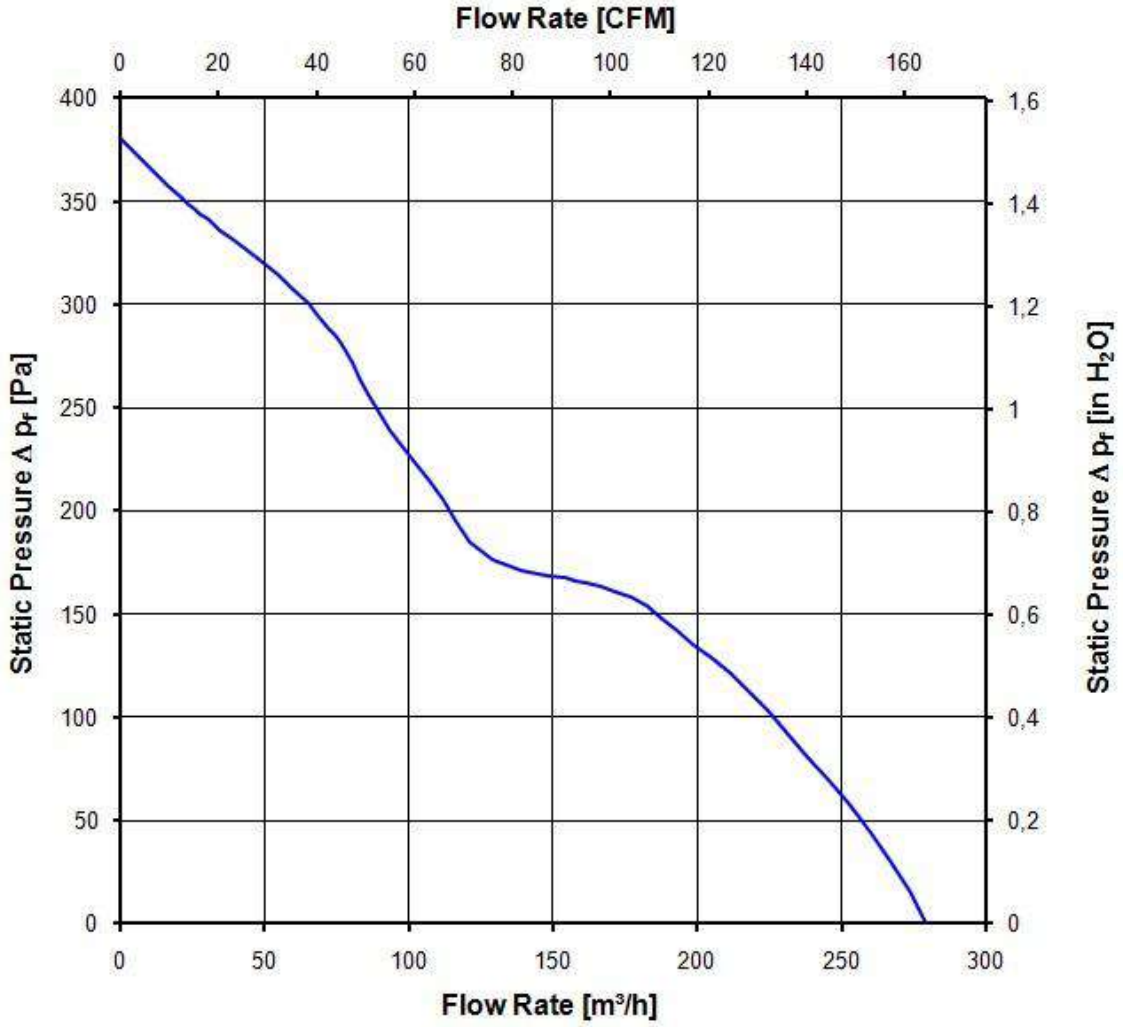
3.4 Aerodynamics

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. 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:

6.000 1/min at free air flow	PWM 100 %;		

Max. free-air flow (Δp = 0 / $\dot{V}$ = max.)	280,0 m3/h	
Max. static pressure (Δp = max. / $\dot{V}$ =0)	380 Pa	



3.5 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:

6.000 1/min at free air flow	PWM 100 %	PWM min.:	PWM max.:

Optimal operating point	185,0 m3/h @ 137 Pa	
Sound power level at the optimal operating point	6,9 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	61,0 dB(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	70 °C	
Min. permitted storage temperature TL min.	-20 °C	
Max. permitted storage temperature TL max.	80 °C	

4.2 Climatic Requirements

IP-protection type (certified)	IP 68 (for fan only, not for connector if applicable) **)	
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	
Salt fog requirements	salt fog, cyclic, in operation; according to DIN EN 60068-2-52, 3 cycle	

*) Permittet 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.
**) The specification of the IP protection refers to the conditions mentioned in certification of the fan. The above mentioned short description of the protection scope is not final. For detailed information of the respective protection scope and definitions, see certification as well as DIN EN 60529 (protection by housings) and ISO 20653 (for vehicles) with the letter K.

Short description of the IP-protection type:
Solid particle Protection: Dust tight.
Protection against deliberate contact: Protected against contact to hazardous parts with a wire.

Protection against water: The fan test according to IP68 (Based on IEC 60529), is conducted in non-operating mode. The fan is tested by a complete immersion in water for a period of 2h at a water-level of 1,2m. Electrical connections are not immersed since they are customer specific.
Please require severity levels and specification parameters from the responsible development departments

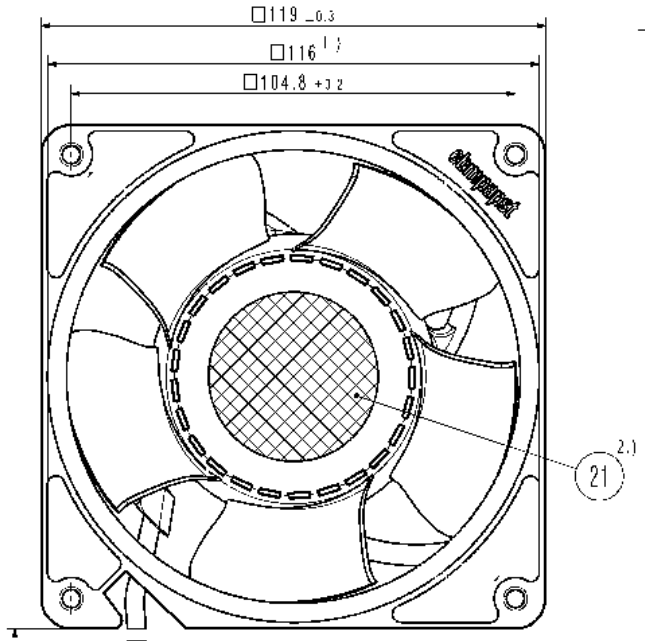
5 Safety

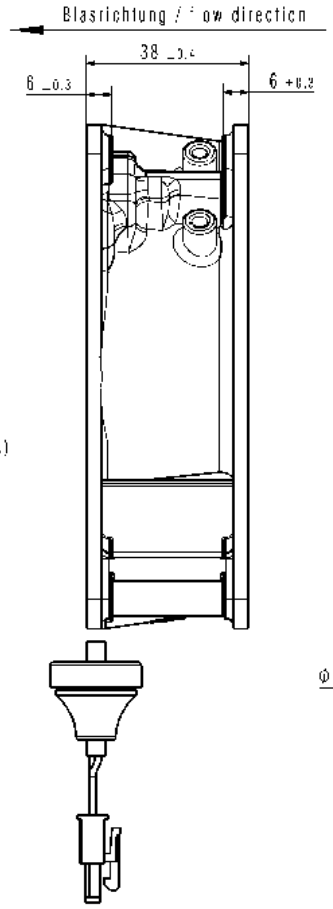
5.1 Electrical Safety

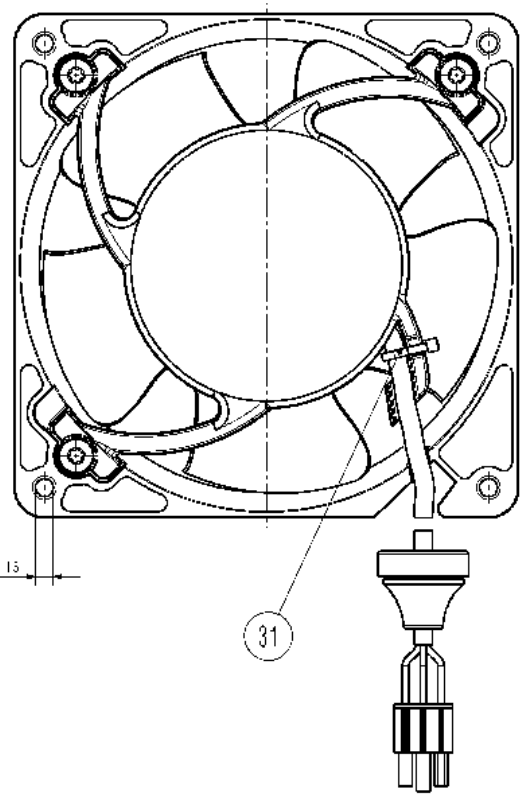
Dielectric strength DIN EN 60950 (VDE 0805) and DIN EN 60335 (VDE 0700) A.) Type test Measuring conditions: After 48h of storage at 95% R.H. and 25°C. No arcing or breakdown is allowed! All connections together to ground. B.) Routine test Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All connections together to ground.	500 VAC / 1 Min. 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 / 1,2 mm	
Protection class	III	

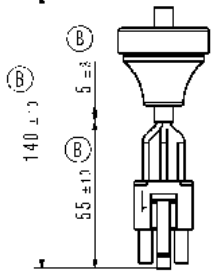
5.2 Approval Tests

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	No









Steckergehäuse / plug housing:
Molex: P/N 39-01-4031 (B)

Kontakt / contact:
Molex: P/N 39-03-2038 (B)

Kabeldurchführung / cable grommet:
Gummi Vogt: 1201 SKAP Wellic N16; 5,0 7,0

Steckerbelegung PIN configuration	Litzenfarbe wire colour
PIN 1 (-)	grün / green
PIN 2 (PWM input)	braun / brown
PIN 3 (+)	weiß / white

1.) Maß für Montagewand
2.) Klebeschild aufgeklebt
--- Axialspiel der Kugellager mit Feder spielfrei verspannt

1.) dimension for mounting cut-out
2.) adhesive label glued
--- ball bearings without axial clearance by a pre-loaded spring

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