

**ebmpapst Datasheet**

**9295420103**

VKS0168XULDS  
DV6314/2TDHHP

**ebmpapst**

The engineer's choice

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DV6314/2TDHHP

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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	Ball bearing	
Mounting position - shaft	Any	

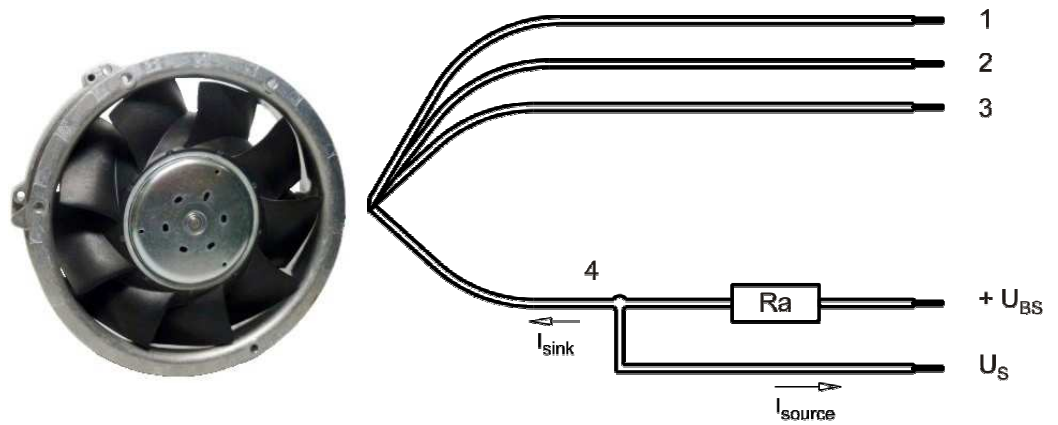
**2 Mechanics****2.1 General**

Depth	51 mm	
Diameter	178 mm	
Mass	1,05 kg	
Housing material	Metal	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges Screw size	Wire outlet corner: 180 Ncm Remaining corners: 180 Ncm ISO 4762 - M4 degreased, without an additional brace and without washer	

Do Not cover the ventilation holes in the flange

**2.2 Connections**

Electrical connection	Wires	
Lead wire length	L = 365 mm	
Tolerance	+ - 10 mm	
Tube length	S = 20 mm	
Tolerance	+ - 5 mm	
Wire size (AWG)	18	
Insulation diameter	2,2 mm	



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

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

Lead wire 1 - 2: AWG18 (Insulation diameter 2,2m)  
 Lead wire 3 - 4: AWG22 (Insulation diameter 1,35 mm)

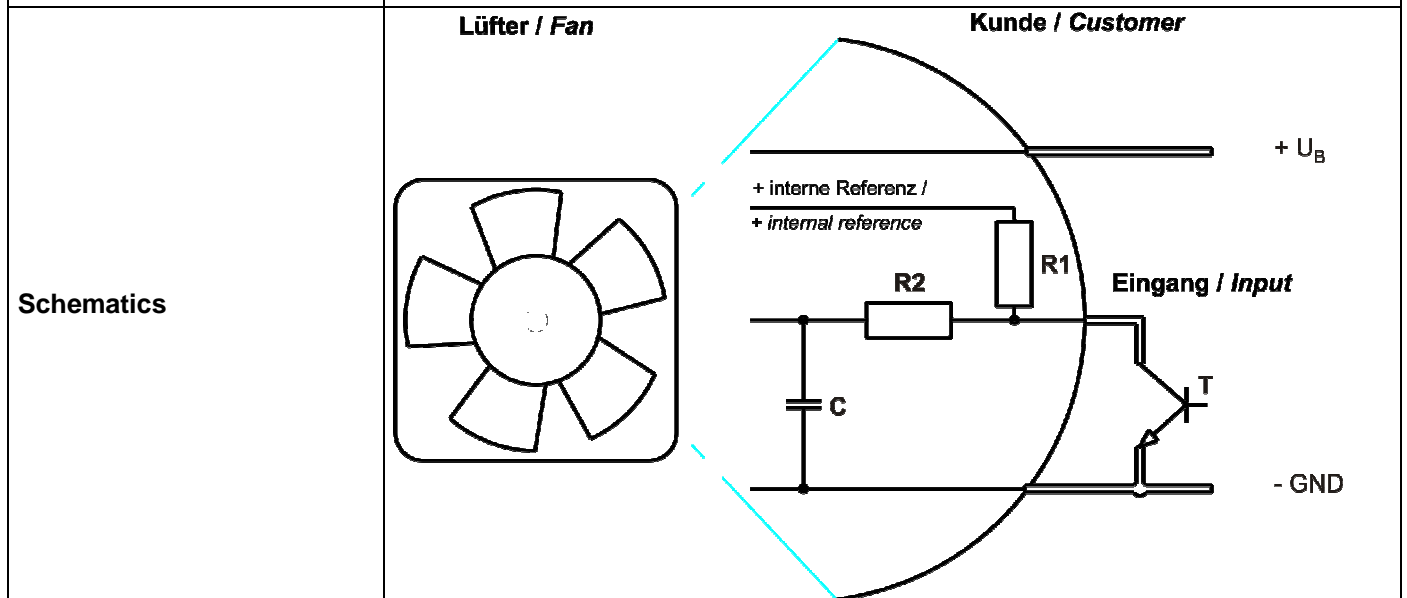
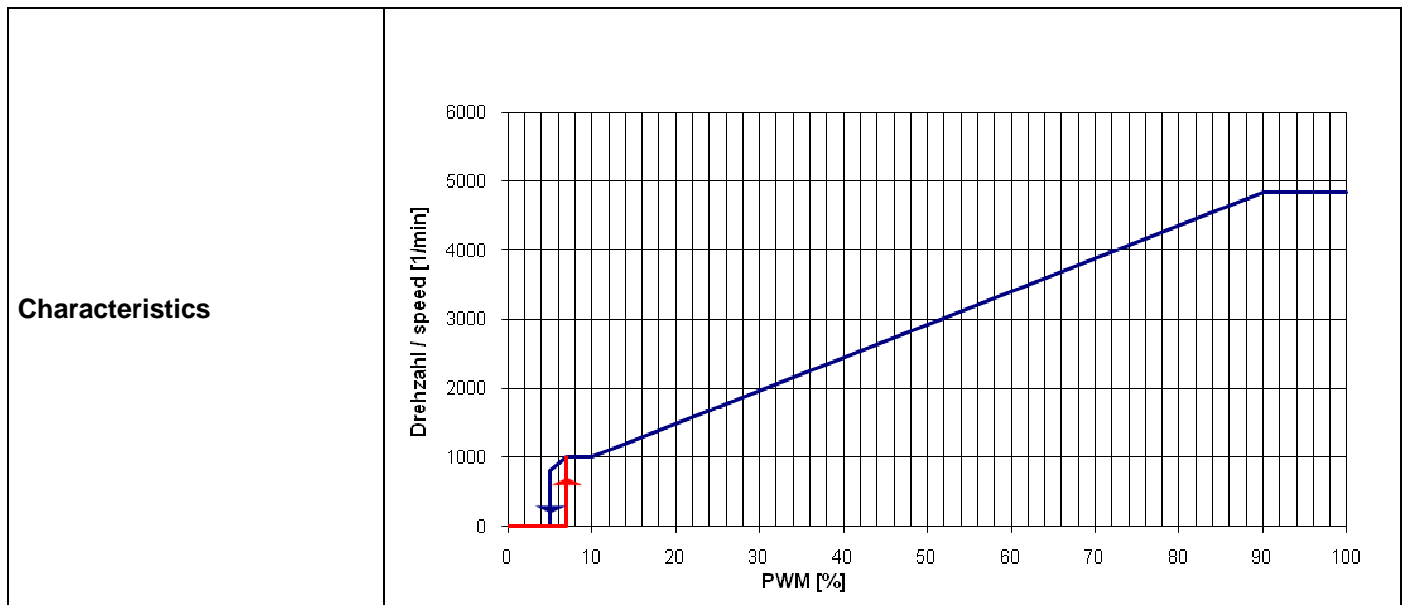
3 Operating Data

3.1 Electrical Interface - Input

Control input	PWM
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Features

Input type	Open collector	
PWM - Frequency		1 kHz - 10 kHz typical: 2 kHz



**Transistor requirements:**

Vce max. >= 12V; Isink max. >= 5mA

Vce sat. <= 0,15V

**Information to the curve:**

0 % - <7% PWM: 0 1/min

7 % PWM: 1.000 1/min (Fan on, coming from 0% PWM)  
 7 % - 10% PWM: 1.000 1/min (corresponding to min. speed)  
 10 % - 90% PWM: linear increasing curve  
 90 % - 100% PWM: 4.850 1/min (corresponding to max. speed)  
 7 % - >5 % PWM: linear decreasing curve (coming from 100% PWM)  
 5 % PWM: 800 1/min or 0 1/min (Fan off, coming from 100% PWM)  
 Based on the power lifting the maximum speed can be 5500 1/min.

**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.

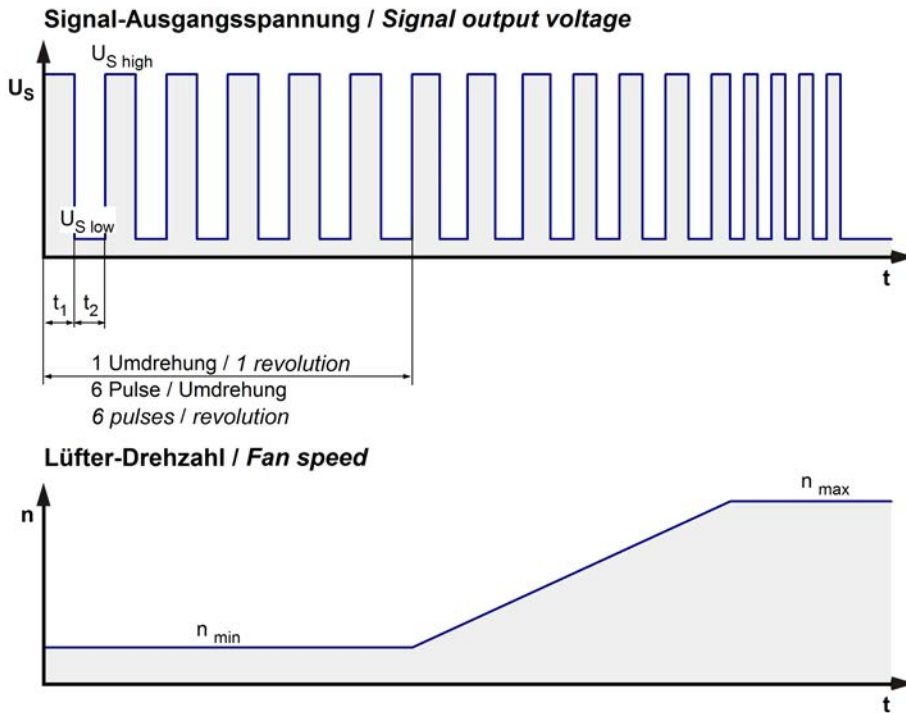
$\Delta p = 0$ : corresp. to free air flow (see chapter aerodynamics)  
 I: corresp. to arithm. mean current value

Name	Condition
PWM 0001	PWM: 100 %; f: 2 kHz

Features	Condition	Symbol	Values		
Voltage range		U	16 V		36 V
Nominal voltage		U <sub>N</sub>		24,0 V	
Power consumption	$\Delta p = 0$	P	50,5 W	118 W	119 W
Tolerance	PWM 0010		+/- 10 %	+/- 10,0 %	+/- 10,0 %
Current consumption	$\Delta p = 0$	I	3.160 mA	4.860 mA	3.300 mA
Tolerance	PWM 0010		+/- 10,0 %	+/- 10,0 %	+/- 10,0 %
Speed	$\Delta p = 0$	n	3.680 1/min	4.850 1/min	4.850 1/min
Tolerance	PWM 0010		+/- 5,0 %	+/- 3,0 %	+/- 5,0 %
recommended slew rate of the input voltage			$\Delta U / \Delta t = 100 \text{ V} / \text{sec.}$		
max. allowed input voltage ripple (within the specified voltage range)			+/- 3 %		
max. allowed input voltage ripple (within the specified voltage range)			>= 50 Hz		

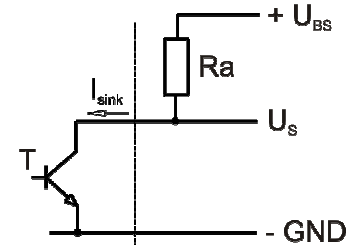
3.3 Electrical Interface - Output

Tacho type	/2 (open collector)
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$$R_a = \frac{U_{BS} - U_{S\ low}}{I_{sink}}$$

Lüfter / Fan      Kunde / Customer

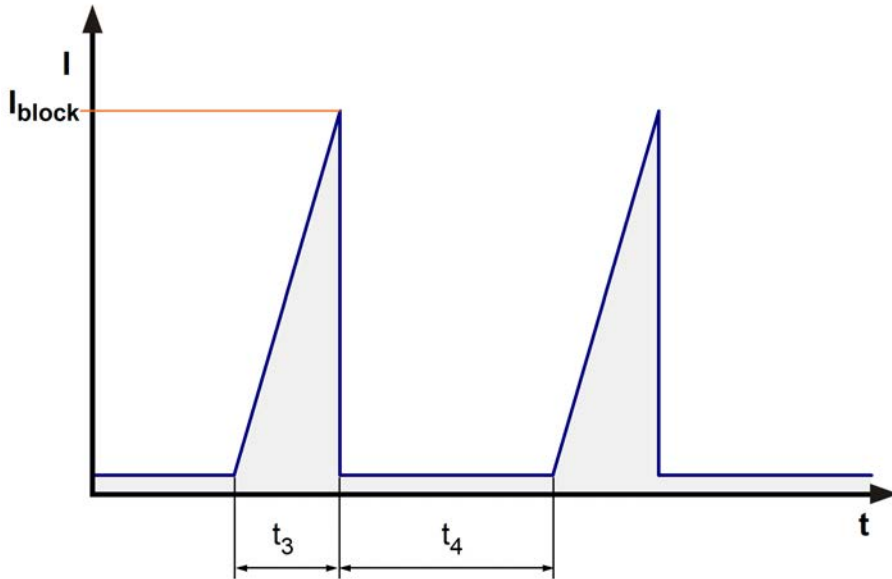


Features	Note	Values
Tacho operating voltage	$U_{BS}$	$\leq 32\ V$
Tacho signal Low	$U_{S\ low}$	$\leq 0,4\ V$
Tacho signal High	$U_{S\ high}$	$\leq 32\ V$
Maximum sink current	$I_{sink}$	$\leq 20\ mA$
External resistor	External resistor $R_a$ from $U_{BS}$ to $U_S$ required. All voltages measured to GND.	
Tacho frequency	$(6 \times n) / 60$	485 Hz
Tacho isolated from motor	No	
Slew rate		$\Rightarrow 0,5\ V/\mu s$

$n$  = revolutions per minute (1/min)

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection	N-CH FET	
Max. residual current at $U_N$	$I_F \leq 5 \text{ mA}$	
Locked rotor protection	Auto restart	
Locked rotor current at $U_N$	$I_{\text{block}}$ approx. 1.500 mA	
Clock signal at locked rotor	$t_3 / t_4$ typical: 6,0 s / 10,0 s	



3.5 Data According ErP Directive

Installation / Efficiency category	A / static
Speed control	integrated
Specific ratio	1,00357
Target overall efficiency 2015	30,2 %
Overall efficiency	38,6 %
Efficiency grade	50
Power input	115 W
Speed	4.820 1/min

All values measured in optimum energy efficiency point.

Productiondatecode is printed on the fan label.

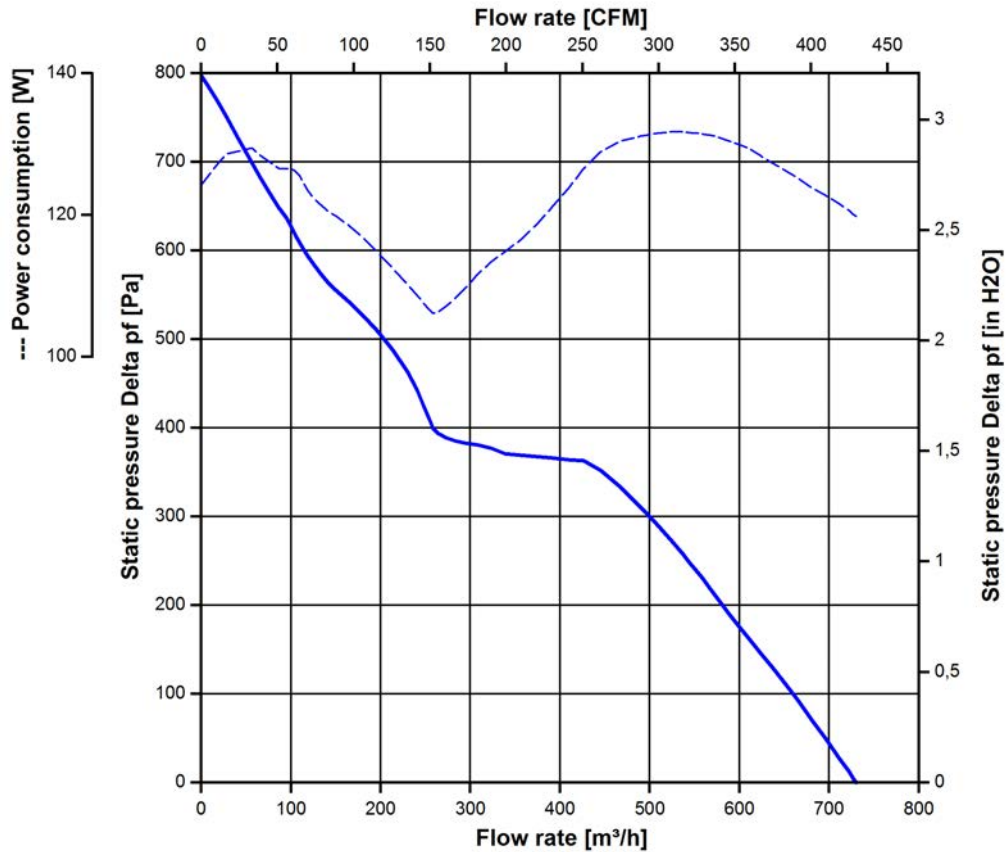
3.6 Aerodynamics

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. 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. Power consumption of the fan motor when operating at normal voltage is shown. Depending on the operating conditions of the application, the power input may be higher.

a.) Operation condition:

4.850 1/min at free air flow	PWM 100 %; f: 2 kHz		
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Max. free-air flow ( $\Delta p = 0 / \dot{V} = \text{max.}$ )	730,0 m <sup>3</sup> /h	
Max. static pressure ( $\Delta p = \text{max.} / \dot{V} = 0$ )	800 Pa	



### 3.7 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 chapter aerodynamics.

a.) Operation condition:

4.850 1/min at free air flow	PWM 100 %; f: 2 kHz		
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Optimal operating point	510,0 m <sup>3</sup> /h @ 257 Pa		
Sound power level at the optimal operating point	8,0 bel(A)		
Sound pressure level at free air flow, measured in rubber bands	72,0 dB(A)		

## 4 Environment

### 4.1 General

Min. permitted ambient temperature TU min.	-20 °C		
Max. permitted ambient temperature TU max.	60 °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.	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 / 1,2 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 E38324
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	Not applicable

## 6 Reliability

### 6.1 General

Life expectancy L10 at TU = 40 °C	75.000 h	
Life expectancy L10 at TU = 60 °C	47.500 h	
Life expectancy L10 at TU max.	47.500 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	127.500 h	

