

Product Data Sheet

9793510200

VCS0100XUGBS

RLF100-11/12/2HP

**ebmpapst**

Engineering a better life



RLF100-11/12/2HP

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1 General

Fan type	Blower	
Rotating direction looking at rotor	Clockwise	
Airflow direction	Air in axially, Air out radially	
Bearing system	Ball bearing	
Mounting position - shaft	Any	

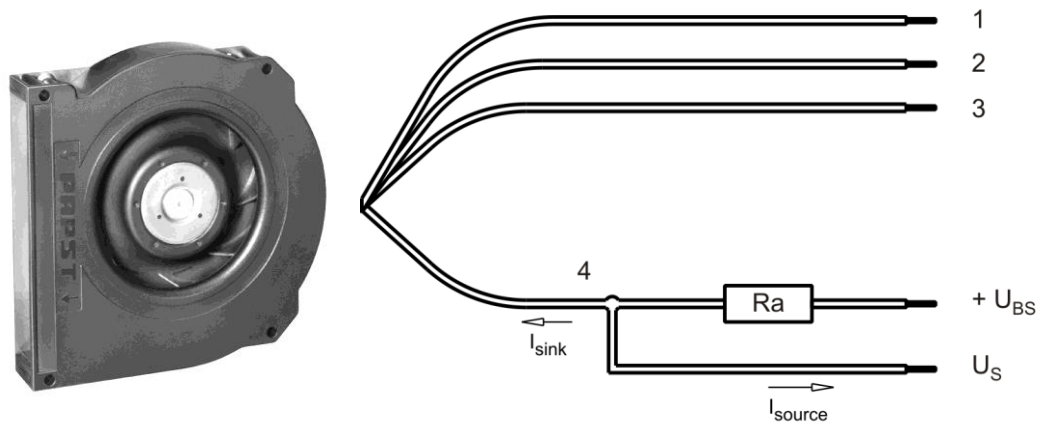
2 Mechanics

2.1 General

Width	127,0 mm	
Height	127,0 mm	
Depth	25,4 mm	
Mass	0,300 kg	
Housing material	Mixed	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	Wire outlet corner: 190 Ncm Remaining corners: 190 Ncm	
Screw size	ISO 4762 - M4 degreased, without an additional brace and without washer	

2.2 Connections

Electrical connection	Wires	
Lead wire length	L = 310 mm	
Tolerance	+ - 10,0 mm	



Wire	Color	Operation	Wire size	Insulation diameter
1	red	+ UB	AWG 22	1,70 mm
2	blue	- GND	AWG 22	1,70 mm
3	violet	PWM	AWG 22	1,70 mm
4	white	Tacho	AWG 22	1,70 mm

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

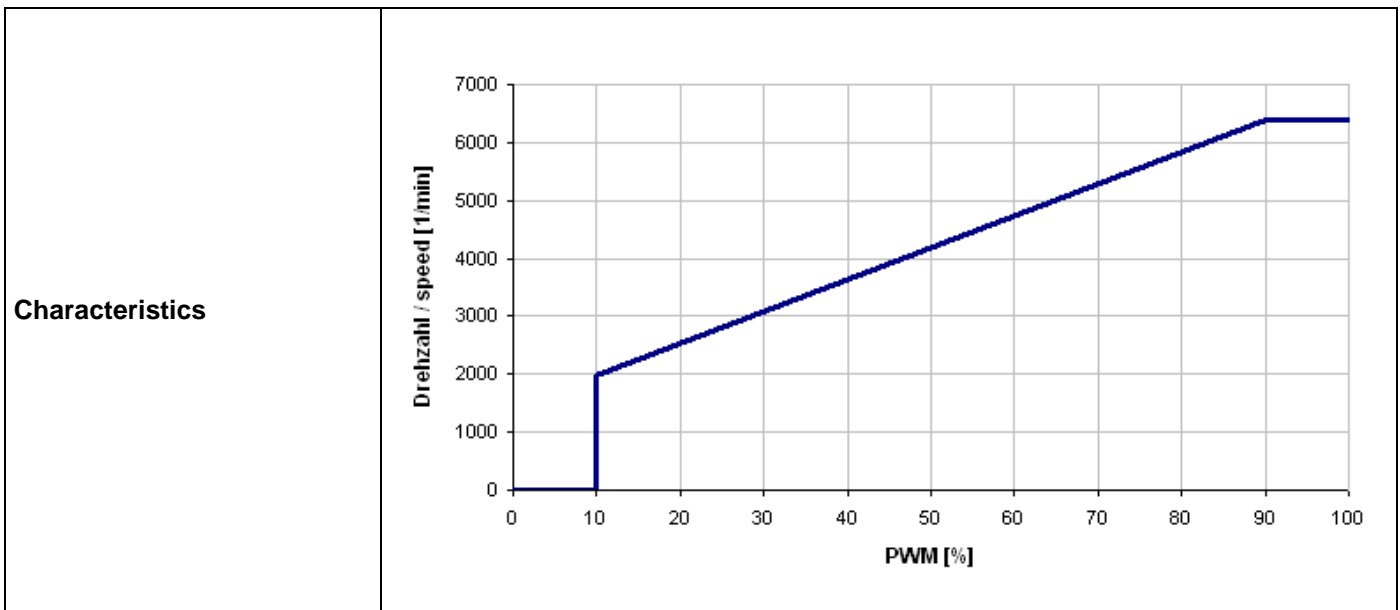
3 Operating Data

3.1 Electrical Interface - Input

Control input	PWM
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Features

PWM - Frequency	35 Hz - 10 kHz
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**Speed control:**

0...100% PWM / 100% = continuous high,  
 f = 35 Hz...10 kHz  
 connection of an open collector transistor

## 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.

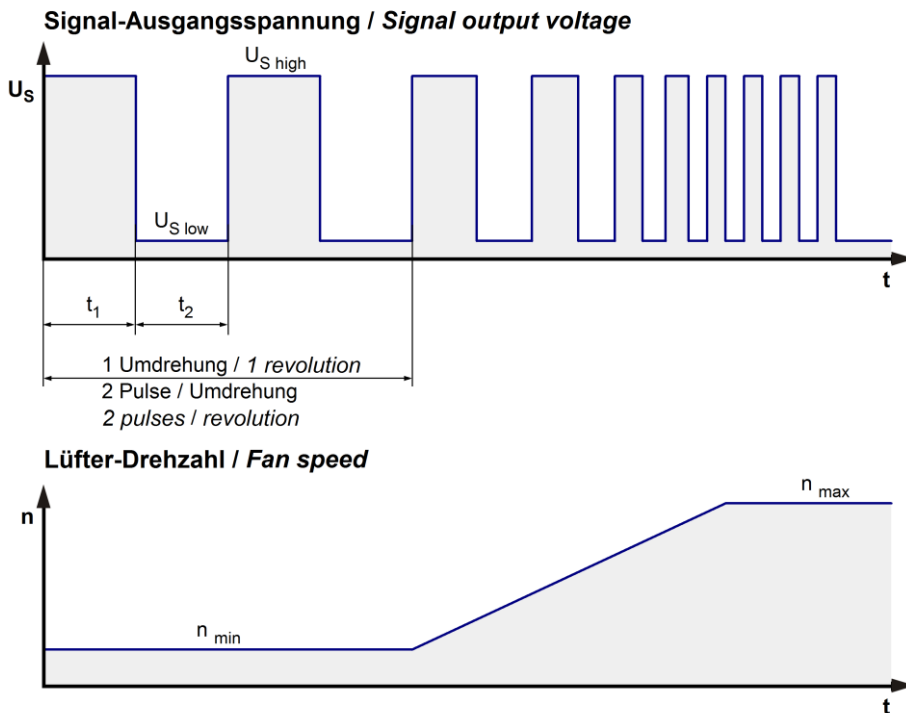
$\Delta p = 0$ : corresp. to free air flow (see chapter aerodynamics)  
I: corresp. to arithm. mean current value

Name	Condition		
PWM 0001	PWM: 100 %;	f: 35 Hz	f: 10 kHz

Features	Condition	Symbol	Values		
Voltage range		U	10,0 V		13,2 V
Nominal voltage		U <sub>N</sub>		12,0 V	
Power consumption	$\Delta p = 0$	P	0,2 W	18,6 W	20,6 W
Tolerance	PWM 0004		+/- 17,5 %	+/- 17,5 %	+/- 17,5 %
Current consumption	$\Delta p = 0$	I	1.380 mA	1.450 mA	1.560 mA
Tolerance	PWM 0010		+/- 17,5 %	+/- 17,5 %	+/- 17,5 %
Speed	$\Delta p = 0$	n	6.000 1/min	6.400 1/min	6.400 1/min
Tolerance	PWM 0010		+/- 5,0 %	+/- 5,0 %	+/- 5,0 %
Starting current consumption				3.750 mA	

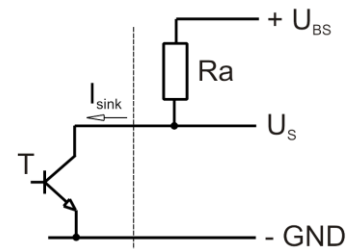
3.3 Electrical Interface - Output

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

Lüfter / Fan      Kunde / Customer

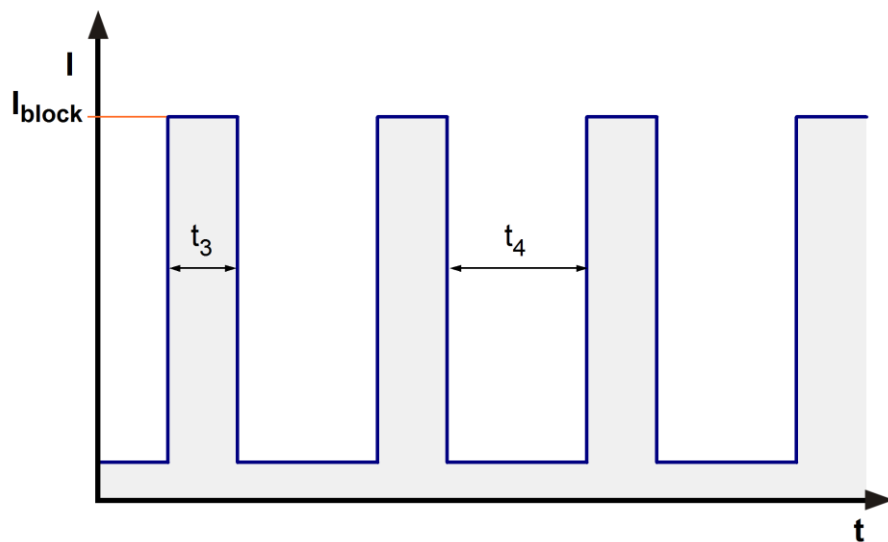


Features	Note	Values
Tacho operating voltage	$U_{BS}$	$\leq 60,0\ V$
Tacho signal Low	$U_{S\ low}$	$\leq 0,4\ V$
Tacho signal High	$U_{S\ high}$	$\leq 60,0\ V$
Maximum sink current	$I_{sink}$	$\leq 4\ mA$
External resistor	External resistor $R_a$ from $U_{BS}$ to $U_S$ required. All voltages measured to GND.	
Tacho frequency	$(2 \times n) / 60$	
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	Rectifying diode	
Max. residual current at $U_N$	$I_F \leq 3 \text{ mA}$	
Locked rotor protection	Auto restart	
Locked rotor current at $U_N$	$I_{\text{block}}$ approx. 3.750 mA	
Clock signal at locked rotor	$t_3 / t_4$ typical: 0,4 s / 20,0 s	



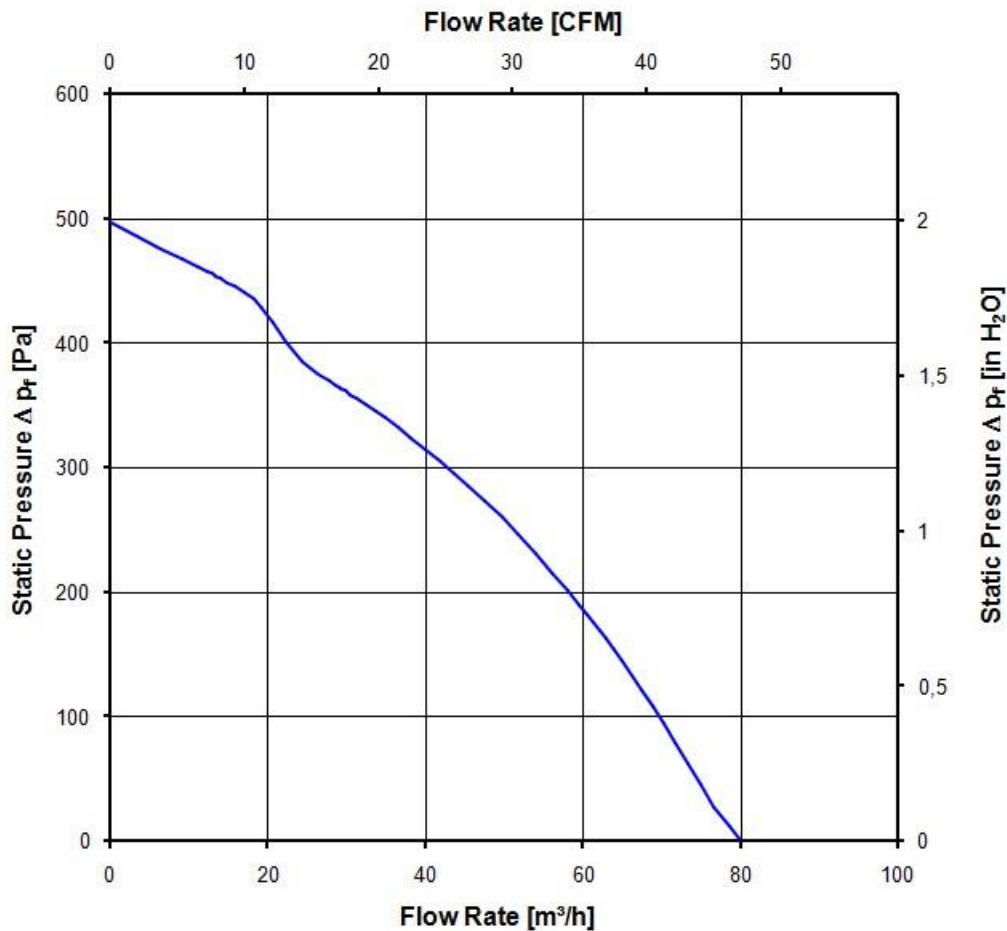
### 3.5 Aerodynamics

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.

a.) Operation condition:

6.400 1/min at free air flow	PWM 100 %;	f: 35 Hz	f: 10 kHz
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Max. free-air flow ( $\Delta p = 0 / \dot{V} = \text{max.}$ )	80,0 m <sup>3</sup> /h	
Max. static pressure ( $\Delta p = \text{max.} / \dot{V} = 0$ )	500 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 semianechoic chamber with a background noise level of  $L_p(A) < 5 \text{ dB}(A)$   
For further measurement conditions see chapter aerodynamics.

a.) Operation condition:

6.400 1/min at free air flow	PWM 100 %;	f: 35 Hz	f: 10 kHz
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Optimal operating point	20,0 m <sup>3</sup> /h @ 383 Pa	
Sound power level at the optimal operating point	7,0 bel(A)	
Sound pressure level at free air flow, measured in rubber bands		

## 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.

### 4.3 EMC

<b>Kind</b>	<b>Radiated Emission; 30 MHz - 1000 MHz</b>
According	DIN EN 55032:2016-02
Check accuracy / Limit	Class B
Result	Below limit Class B

**5 Safety****5.1 Electrical Safety**

Dielectric strength DIN EN 62368 and DIN EN 60335 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.  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**

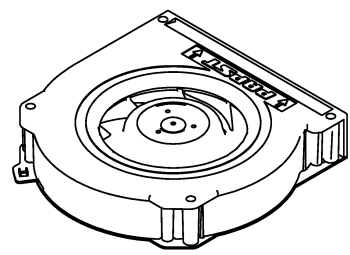
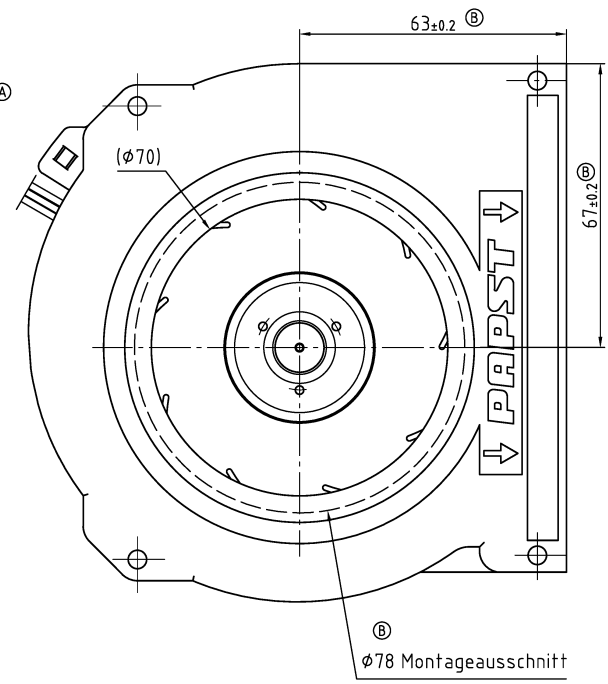
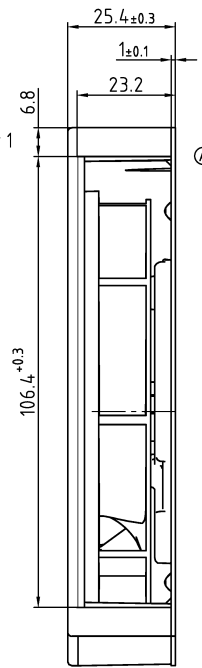
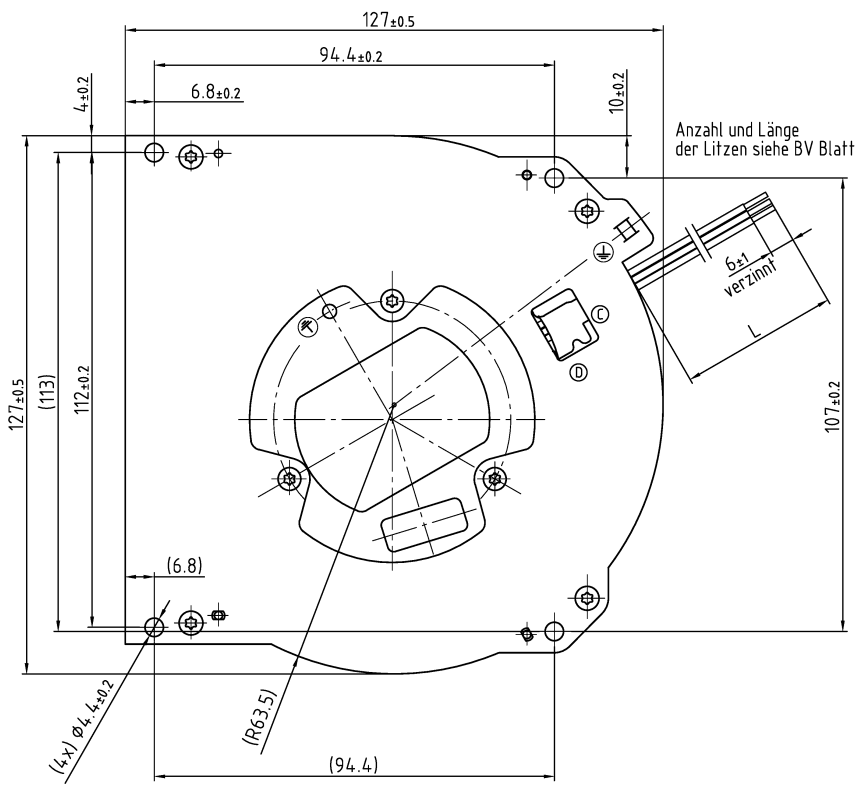
CE	EC Declaration of Conformity	Yes
EAC	Eurasian Conformity	Yes
UL	Underwriters Laboratories	Yes / UL507, Electric Fans E38324
VDE	Association for Electrical, Electronic and Information Technologies	Yes / Approval acc. to EN 62368 - Audio/video, information and communication technology equipment
CSA	Canadian Standards Association	Yes / CSA audited by UL according to 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	72.500 h	
Life expectancy L10 at TU max.	45.000 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	122.500 h	

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Schutzzeichen nach DIN ISO 8016 beachten



Axialspiel bei  
 - Kugellagerung (K): 0 (mit Federausgleich)

Tolerierung: DIN 7167			
Allgemeintoleranzen: DIN ISO 2768-mK			
			Artikel
			Maßstab
Bearbeitet	Datum	Name	Zchg.-Nr.
		<b>ebmpapst</b>	Blatt
Geprüft u. zur Verwendung freigegeben von		ebm-papst St. Georgen GmbH & Co. KG	Ers.f.Zchg.
			A3