

251657216

**Product Data Sheet**

**8315100142**

VWC0120KUJBS

AF120-00142 24V P/2

6.500

**ebmpapst**

The engineer's choice



AF120-00142 24V P/2 6.500

INDEX

- 1 General ..... 3**
- 2 Mechanics ..... 3**
  - 2.1 General..... 3
  - 2.2 Connections..... 3
- 3 Operating Data ..... 5**
  - 3.1 Electrical Interface - Input..... 5
  - 3.2 Electrical Operating Data ..... 6
  - 3.3 Electrical Interface - Output..... 7
  - 3.4 Electrical Features ..... 8
  - 3.5 Aerodynamics ..... 9
  - 3.6 Sound Data..... 10
- 4 Environment..... 10**
  - 4.1 General..... 10
  - 4.2 Climatic Requirements ..... 10
  - 4.3 EMC ..... 10
- 5 Safety..... 12**
  - 5.1 Electrical Safety ..... 12
  - 5.2 Approval Tests ..... 12
- 6 Reliability..... 12**
  - 6.1 General..... 12

**1 General**

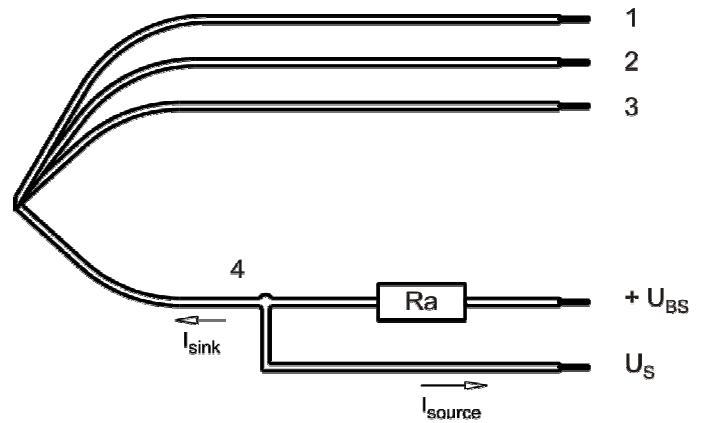
Fan type	Fan	
Rotating direction looking at rotor	Counterclockwise	
Airflow direction	Air outlet over struts	
Bearing system	Ball bearing	
Mounting position - shaft	Any	

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

Width	120 mm	
Height	120 mm	
Depth	38,0 mm	
Mass	0,32 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges Screw size	Wire outlet corner: 80 Ncm Remaining corners: 80 Ncm 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	blue	- GND	AWG 24	1,6 mm
2	red	+ UB	AWG 24	1,6 mm
3	white	Tacho	AWG 24	1,6 mm
4	violet	PWM	AWG 24	1,6 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
---------------	-----

#### Features

Input type	Open collector	
PWM - Frequency		1 kHz - 30 kHz typical: 25 kHz
Max. voltage for logic "Low"		0,2 V
Maximum source current	short circuit current	$\leq 1 \text{ mA}$
Typical time until warm restart	After shutdown by PWM	$\sim 9 \text{ s}$

<p><b>Characteristics</b></p>	
<p><b>Schematics</b></p>	

Because it is an open-loop control, the PWM characteristic can vary depending on the location.

### 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.

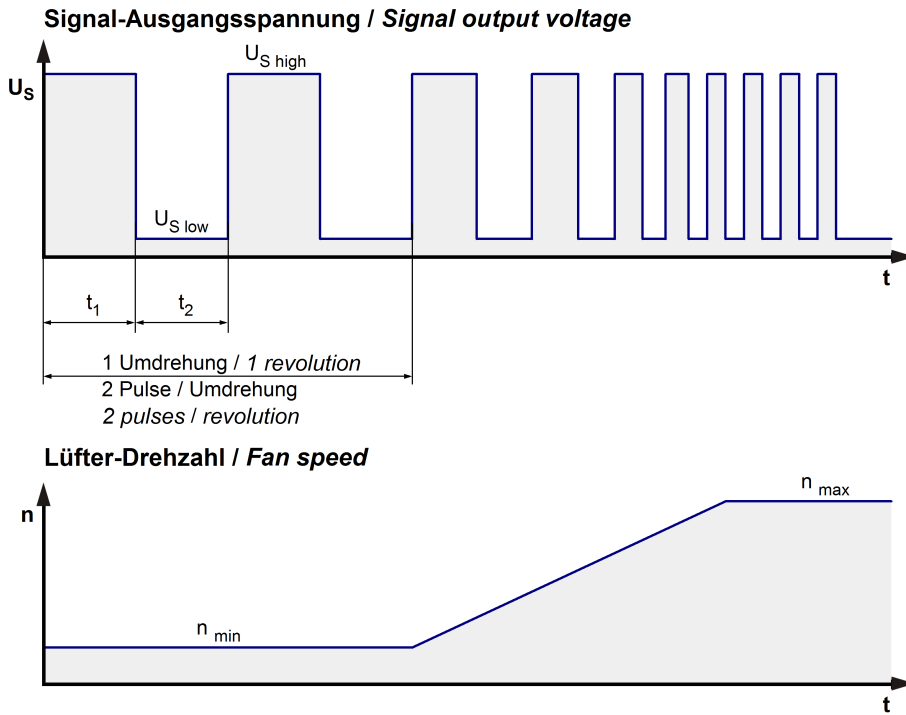
$\Delta p = 0$ : corresp. to free air flow (see chapter aerodynamics)  
I: corresp. to arithm. mean current value

Name	Condition		
PWM 0001	PWM: 100 %; f: 25 kHz	f: 1 kHz	f: 30 kHz

Features	Condition	Symbol	Values		
Voltage range		U	16 V		28 V
Nominal voltage		U <sub>N</sub>		24 V	
Power consumption	$\Delta p = 0$	P	16 W	30 W	35 W
Tolerance	PWM 0010		+/- 20 %	+/- 17,5 %	+/- 17,5 %
Current consumption	$\Delta p = 0$	I	1.000 mA	1.250 mA	1.250 mA
Tolerance	PWM 0010		+/- 17,5 %	+/- 17,5 %	+/- 17,5 %
Speed	$\Delta p = 0$	n	5.050 1/min	6.500 1/min	6.700 1/min
Tolerance	PWM 0010		+/- 15 %	+/- 10 %	+/- 15 %

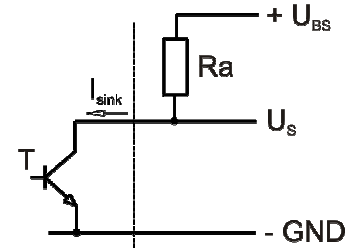
3.3 Electrical Interface - Output

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



$$R_a = \frac{U_{BS} - U_{S\ low}}{I_{sink}}$$

Lüfter / Fan      Kunde / Customer

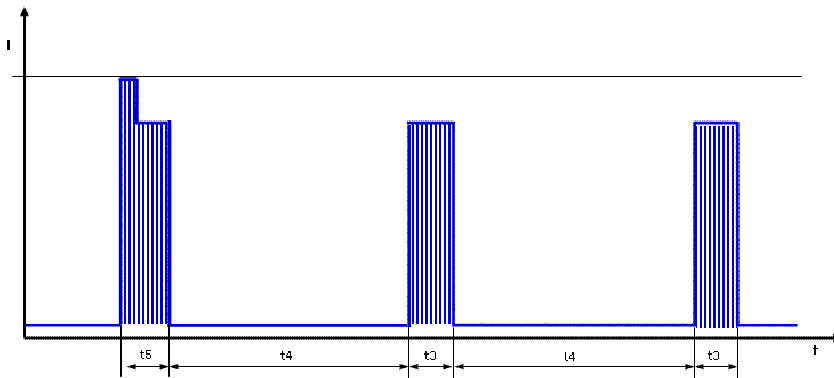


Features	Note	Values
Tacho operating voltage	$U_{BS}$	$\leq 60\ V$ Max.: 60 V
Tacho signal Low	$U_{S\ low}$	$\leq 0,4\ V$
Tacho signal High	$U_{S\ high}$	60 V
Maximum sink current	$I_{sink}$	$\leq 4\ mA$
External resistor	External resistor $R_a$ from $U_{BS}$ to $U_S$ required. All voltages measured 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	Contr. PCB	
Reversed polarity protection	Rectifying diode	
Max. residual current at $U_N$	$I_F \leq 200 \mu A$	
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: 1 s / 9 s	



First pulse  $t_5$  typical 1,6s (1,3 .. 1,9s) followed by  $t_4$ . Afterwards cyclical  $t_3/t_4$ .



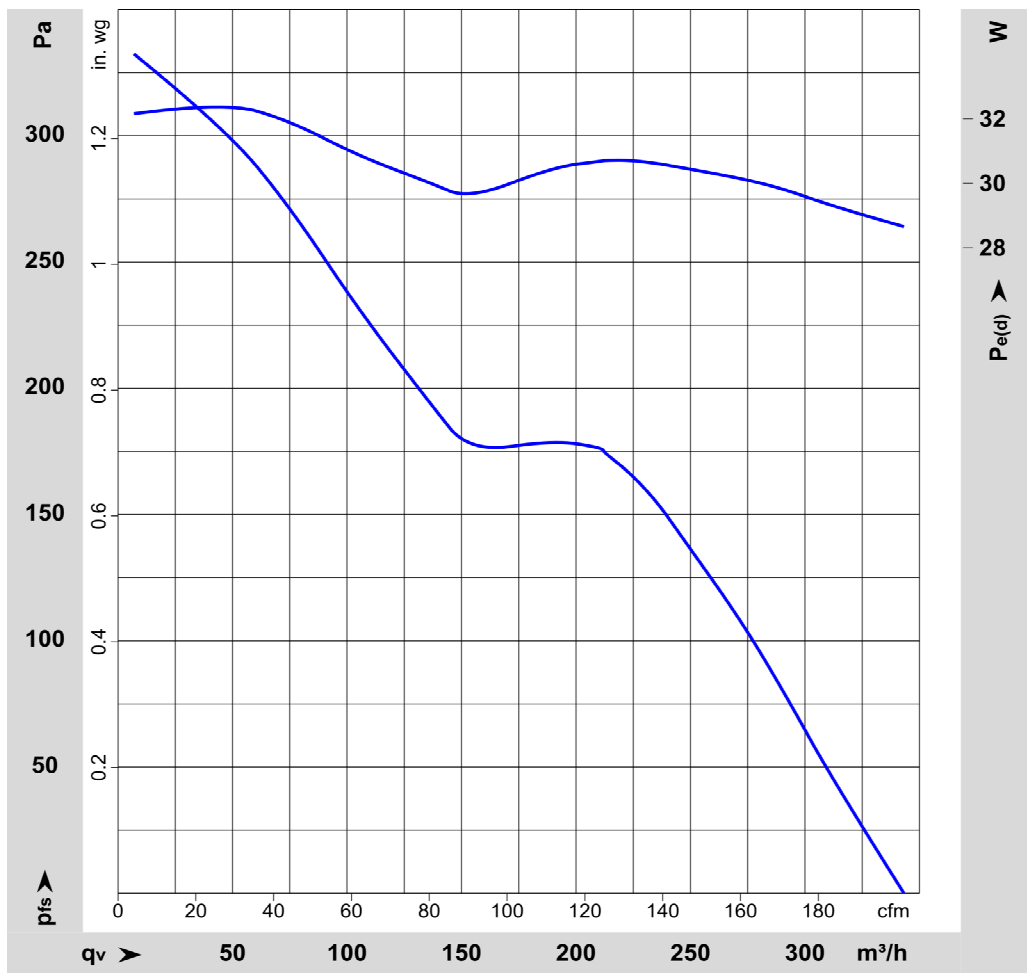
### 3.5 Aerodynamics

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:

6.500 1/min at free air flow	PWM 100 %; f: 25 kHz	f: 1 kHz	f: 30 kHz
------------------------------	----------------------	----------	-----------

Max. free-air flow ( $\Delta p = 0 / \dot{V} = \text{max.}$ )	340 m <sup>3</sup> /h	
Max. static pressure ( $\Delta p = \text{max.} / \dot{V} = 0$ )	320 Pa	



### 3.6 Sound Data

Measurement conditions: Sound pressure level: 1 meter distance between microphone and the air intake.  
Sound power level: According to ISO 13347-3.  
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:

6.500 1/min at free air flow	PWM 100 %; f: 25 kHz	f: 1 kHz	f: 30 kHz
------------------------------	----------------------	----------	-----------

Optimal operating point	290 m <sup>3</sup> /h @ 82 Pa	
Sound power level at the optimal operating point	7 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	60 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.	-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

Kind	Electrostatic Discharge Immunity Test
Accordinging	DIN EN 61000-4-2:2001-12
Ceck accuracy / Limit	Contact Discharge +/- 4 kV; Air Discharge +/- 8 kV
Result	A: The monitored function operates as designed during and after exposure to a disturbance.

Kind	Electromagnetic Field Immunity Test
Accordinging	DIN EN 61000-4-3:2006-12
Ceck accuracy / Limit	10 V/m; 80 - 1000 MHz; AM; m = 0,8; f = 1 kHz; 1%; t = 3 s
Result	A: The monitored function operates as designed during and after exposure to a disturbance.

Kind	Electrical Fast Transient / Burst Immunity Test
Accordinging	DIN EN 61000-4-4:2005-07
Ceck accuracy / Limit	+/- 2 kV on Power Lines; Coupling: POS, NEG, {PE}, ALL, 5 kHz and 100 kHz; 1 min
Result	A: The monitored function operates as designed during and after exposure to a disturbance.

Kind	Immunity to Conducted Disturbances, Induced by RF-Fields
Accordinging	DIN EN 61000-4-6:2001-12
Ceck accuracy / Limit	10 Vrms; 150 kHz - 80 MHz; AM; m = 0,8; f = 1 kHz; 1%; t = 3 s
Result	A: The monitored function operates as designed during and after exposure to a disturbance.

## 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

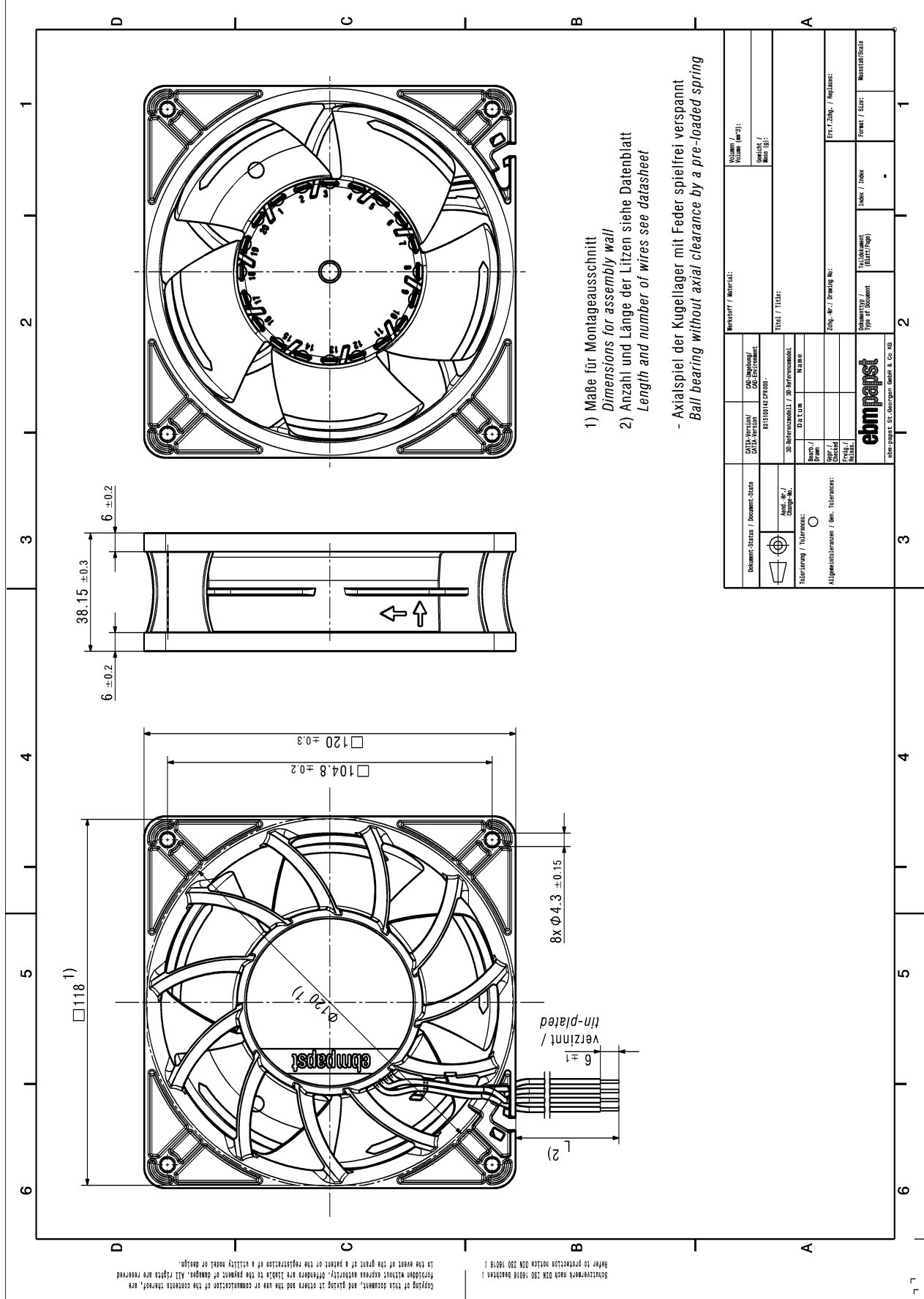
## 6 Reliability

### 6.1 General

Life expectancy L10 at TU = 40 °C	45.000 h	
Life expectancy L10 at TU max.	22.500 h	
Life expectancy L10 acc. to IPC 9591 at TU = 40 °C	75.000 h	

Copying of this document, and giving it others and the use or communication of the contents thereof, are forbidden without express written consent of the manufacturer. The manufacturer shall be liable for damages. All rights are reserved.

Spitzdruck nach DIN ISO 15018/1  
 Refer to production order 01M 150 18018/1



- 1) Maße für Montageausschnitt  
 Dimensions for assembly wall
- 2) Anzahl und Länge der Litzen siehe Datenblatt  
 Length and number of wires see datasheet
- Axialspiel der Kugellager mit Feder spielfrei verspannt  
 Ball bearing without axial clearance by a pre-loaded spring

Document Status / Document-Status	CDTA-Version / CDTA-Version	CD-Material / CD-Material	Hersteller / Material:	Volumen / Volume (4-3):
<input type="checkbox"/> Approved / <input type="checkbox"/> Tolerances:	81510114 01000	81510114 01000	Titel: / Title:	Stück / Quantity
<input type="checkbox"/> Tolerances:	SP-Referenzmodell / SP-Referenzmodell	Name	Zeich.-Nr. / Drawing No.	Form / Format
<input type="checkbox"/> Tolerances:	<input type="checkbox"/> Approved / <input type="checkbox"/> Tolerances:	<input type="checkbox"/> Approved / <input type="checkbox"/> Tolerances:	<input type="checkbox"/> Approved / <input type="checkbox"/> Tolerances:	<input type="checkbox"/> Approved / <input type="checkbox"/> Tolerances:
<b>ebmpapst</b> <small>ebmpapst AG, Georgsmarienhütte &amp; Co. KG</small>			Dokumenttyp / Type of Document	Index / Index
			Form / Format	Maßstab / Scale