# Product Data Sheet

**9694300247**
VUC0119YUJBS
4118 N/2H3P

ebmpapst
The engineer's choice



GREEN TECH

**4118 N/2H3P**

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## 1 General

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

## 2 Mechanics

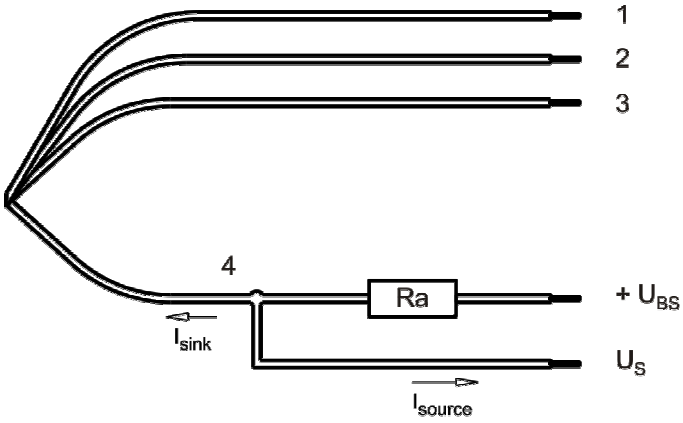
### 2.1 General

| | | |
|---|---|---|
| Width | 119,0 mm | |
| Height | 119,0 mm | |
| Depth | 38,0 mm | |
| Mass | 0,390 kg | |
| Housing material | Metal | |
| Impeller material | Plastic | |
| Max. torque when mounted across both mounting flanges<br>Screw size | Wire outlet corner: 420 Ncm<br>Remaining corners: 560 Ncm<br>ISO 4762 - M4 degreased, without an additional brace and without washer | |

### 2.2 Connections

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






| Wire | Color | Operation | Wire size | Insulation diameter |
|---|---|---|---|---|
| 1 | red | + UB | AWG 22 | 1,7 mm |
| 2 | blue | - GND | AWG 22 | 1,7 mm |
| 3 | violet | PWM | AWG 22 | 1,7 mm |
| 4 | white | Tacho | AWG 22 | 1,7 mm |

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

## 3 Operating Data

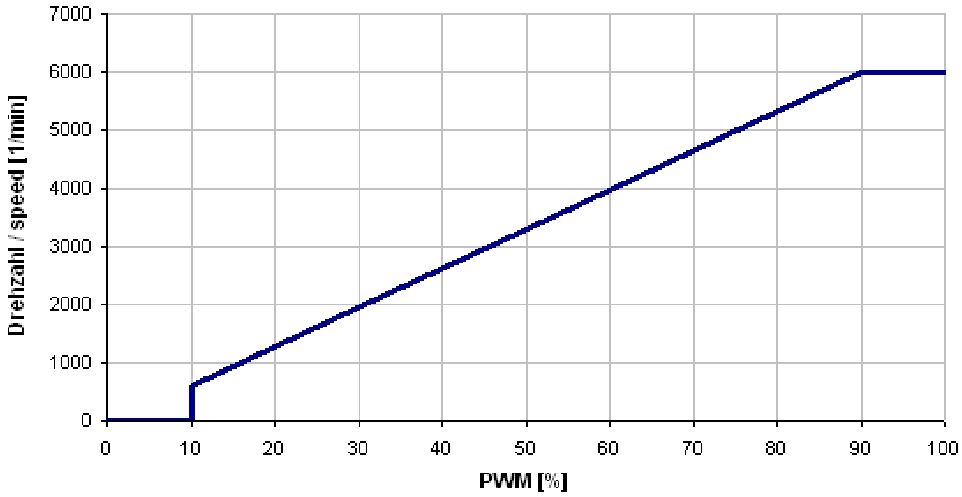
### 3.1 Electrical Interface - Input

| | |
|---|---|
| Control input | PWM |

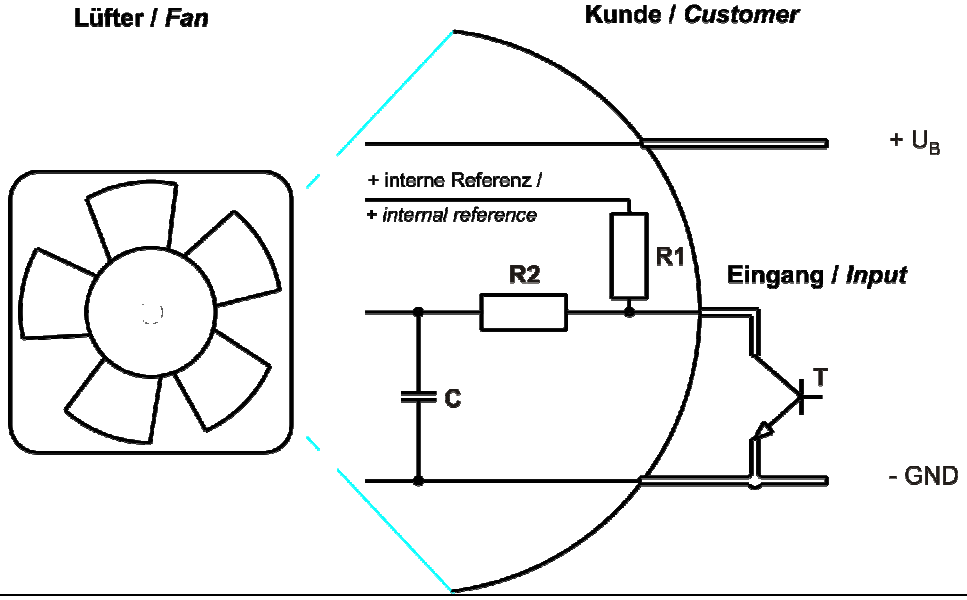
**Features**

| | | |
|---|---|---|
| PWM - Frequency | | 1 kHz - 10 kHz<br>typical: 2 kHz |

**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℃ +/ - 3℃; 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 chapter aerodynamics)
I: corresp. to arithm. mean current value

| **Name** | **Condition** | | |
|---|---|---|---|
| PWM 0001 | PWM: > 90 %; | | |

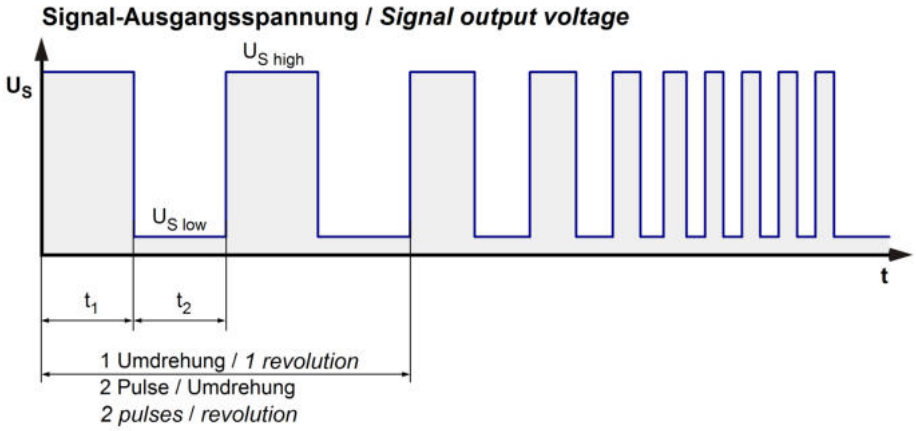
**Note:**
**No inrush current at Unom means:**

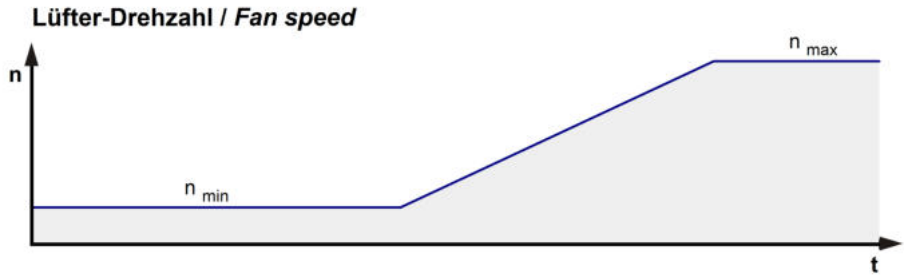
The internal electrolytic capacitor 39uF/100V has no resistor or inrush current limitation, essentially the power supply and the type and length of the connecting cable is limiting the Inrush current.

| **Features** | **Condition** | **Symbol** | **Values** | | |
|---|---|---|---|---|---|
| Voltage range | | U | 30 V | | 60 V |
| Nominal voltage | | $U_N$ | | 48 V | |
| Power consumption<br>Tolerance | Δp = 0<br>PWM 0010 | P | 11,7 W<br>+- 15 % | 22 W<br>+- 15 % | 24,6 W<br>+- 15 % |
| Current consumption<br>Tolerance | Δp = 0<br>PWM 0010 | I | 325 mA<br>+- 15 % | 460 mA<br>+- 15 % | 410 mA<br>+- 15 % |
| Speed<br>Tolerance | Δp = 0<br>PWM 0010 | n | 4.800 1/min<br>+- 10 % | 6.000 1/min<br>+- 10 % | 6.000 1/min<br>+- 10 % |
| Starting current consumption | | | | 1.300 mA | |

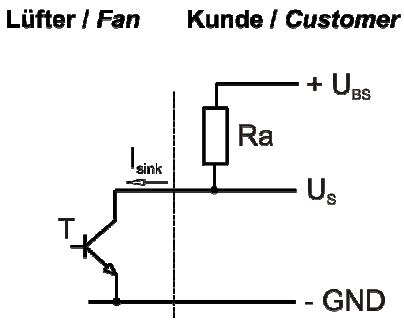
### 3.3 Electrical Interface - Output

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




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

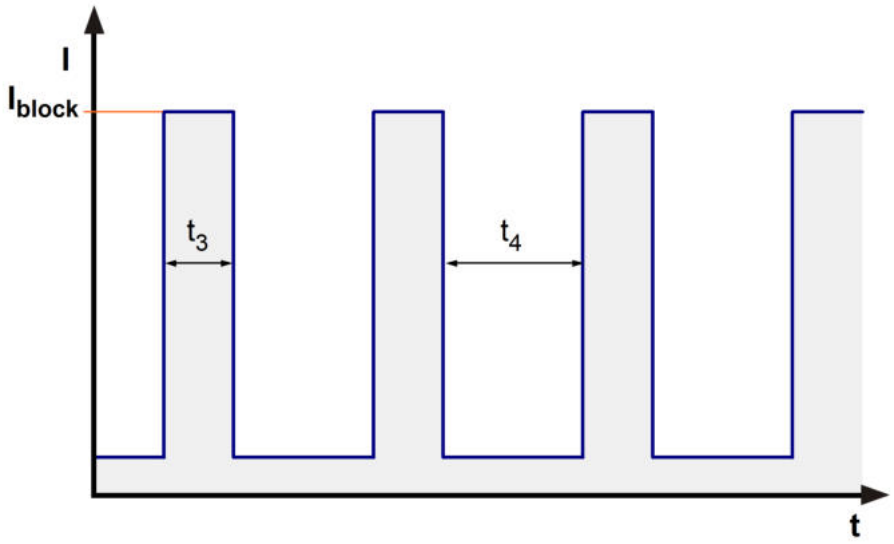



| Features | | Note | Values |
|---|---|---|---|
| Tacho operating voltage | $U_{BS}$ | | 60 V |
| Tacho signal Low | $U_{S\,low}$ | I sink: 2 mA | <= 0,4 V |
| Tacho signal High | $U_{S\,high}$ | I source: 0 mA | 60 V |
| Maximum sink current | $I_{sink}$ | | <= 20 mA |
| External resistor | | External resistor Ra from UBS to US required. All voltages measured to GND. | |
| Tacho frequency | | (2 x n) / 60 | |
| Tacho isolated from motor | | No | |

n = revolutions per minute (1/min)

### 3.4 Electrical Features

| | | |
|---|---|---|
| Electronic function | Speed-Controlled | |
| Reversed polarity protection<br>Max. residual current at $U_N$ | Rectifying diode<br>$I_F$ <= 10 mA | |
| Locked rotor protection | Auto restart | |
| Locked rotor current at $U_N$ | $I_{block}$ approx. 900 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; 4 A (Art.-Nr.: 451004)

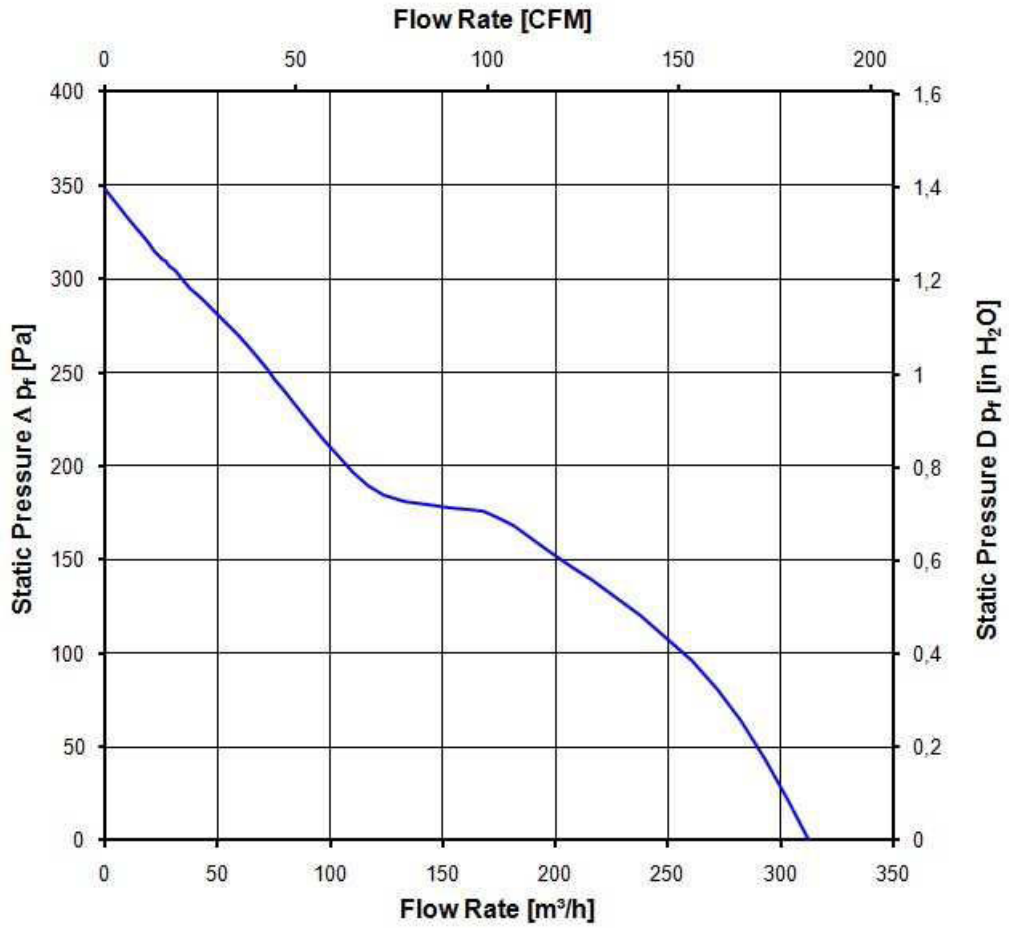
### 3.5 Aerodynamics

| | |
|---|---|
| Measurement conditions: | Measured with a double chamber intake rig acc. to DIN EN ISO 5801.<br>Normal air density = 1,2 kg/m3; Temperature 23℃ +/ - 3℃;<br>In the intake and outlet area should not be any solid obstruction within 0,5 m. Motor shaft horizontal.<br>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 > 90 %; | | |

| | | |
|---|---|---|
| Max. free-air flow (Δp = 0 / $\dot{V}$ = max.) | 310,0 m3/h | |
| Max. static pressure (Δp = max. / $\dot{V}$ =0) | 350 Pa | |



### 3.6 Sound Data

| | |
|---|---|
| Measurement conditions: | Sound pressure level: 1 meter distance between microphone and the air intake.<br>Sound power level: Acc. to DIN 45635 part 38 (ISO 10302)<br>Measured in a semianchoic chamber with a background noise level of Lp(A) < 5 dB(A)<br>For further measurement conditions see chapter aerodynamics. |

a.) Operation condition:

| | | | |
|---|---|---|---|
| 6.000 1/min at free air flow | PWM > 90 %; | | |

| | | |
|---|---|---|
| Optimal operating point | 240,0 m3/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 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<br>DIN EN 60950 (VDE 0805) and DIN EN 60335 (VDE 0700)<br>A.) Type test<br>Measuring conditions: After 48h of storage at 95% R.H. and 25℃.<br>No arcing or breakdown is allowed!<br>All connections together to ground.<br>B.) Routine test<br>Measuring conditions: At indoor climate.<br>No arcing or breakdown is allowed!<br>All connections together to ground. | 500 VAC / 1 Min.<br><br>850 VDC / 1 Sec. | |
| Isolation resistance<br>Measuring conditions: After 48h of storage at 95% R.H. and 25℃ measured with U=500 VDC for 1 min. | RI > 10 MOhm | |
| Clearance / creepage distance | 1,0 mm / 1,5 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 | Yes / GB 12350 Safety Requirements for small Power Motors |

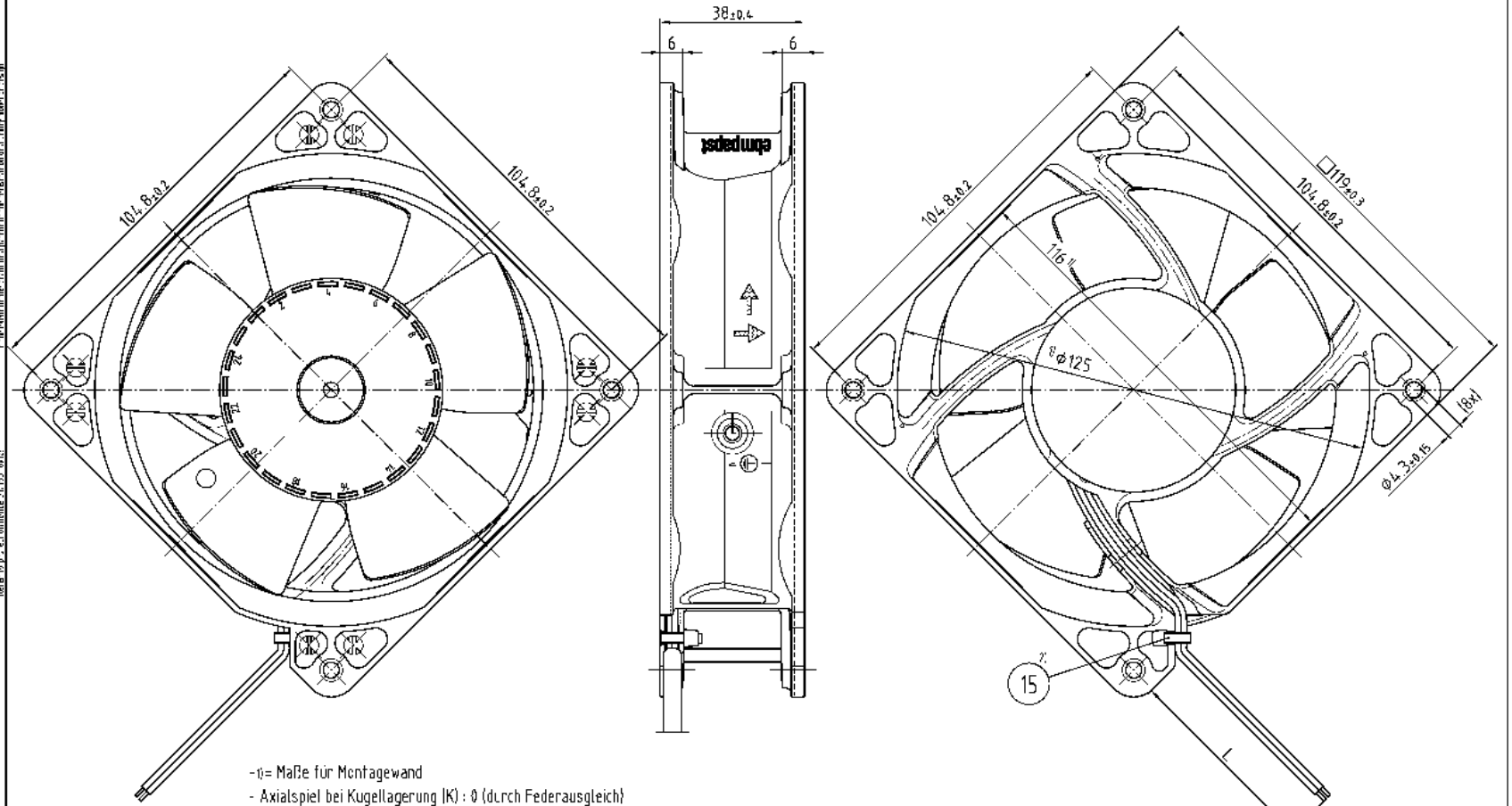
The approval tests are observed to:
U approval max.:60,0 V @ TU approval max.: 65,0 ℃

## 6 Reliability

### 6.1 General

| | | |
|---|---|---|
| Life expectancy L10 at TU = 40 ℃ | 65.000 h | |
| Life expectancy L10 at TU max. | 37.500 h | |
| Life expectancy L10 acc. to IPC 9591 at TU = 40 ℃ | 110. 000 h | |

Schutzvermerk nach DIN 34, 10 beachten/
Refer to protection note DIN 34, 10




-1)= Maße für Montagewand
- Axialspiel bei Kugellagerung (K) : 0 (durch Federausgleich)
- Axialspiel bei Gleitlagerung (G) : 0,1 bis 0,6
-2) = Mit Handhabungswerkzeug montiert,
Kopf darf nach Montage nicht über Außenkontur des Lüftergehäuses stehen

-1)= Measures for prefab wal.
- Axial play with ball bearing (K) 0 (by spring compensation)
- Axial play with sleeve bearing (G): 0,1 to 0,6
-2) = With handling tool installed,
Head may not stand over outer contour of the fan housing after assembly

Leitungslänge siehe Produkt-spezifikation
For conduit length see product specification

| | | | | | |
|---|---|---|---|---|---|
| | | | ebmpapst | Werkstoff/Material: | Vc. Linie/Vc. Line [mm²] |
| SAP-Status/Scale | Änd.-Nr./Change-Nr. | Art/CAD-System-Version | CAD Umgebung/ CAD Environment | | Gewicht/Masses [g] |
| | | Datum/Date | Name/Name | | |
| Toleranzen/Tolerances: Allgemeintoleranzen/Gen. tolerances DIN ISO 2768-1 u. 2-mK | | Bearb./ Drawn | | Artikel/Title: axial compact fan | |
| | | Gepr./ Checked | | | |
| | | Freig./ Released | | | |
| ebmpapst | | | | Zeichn.-Nr./Drawing-No. | Ers. f. Zeichn./Replaces |
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