# Product Data Sheet 4114 N/2H3I

ebmpapst

The engineer's choice



GREEN TECH

**4114 N/2H3I**

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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

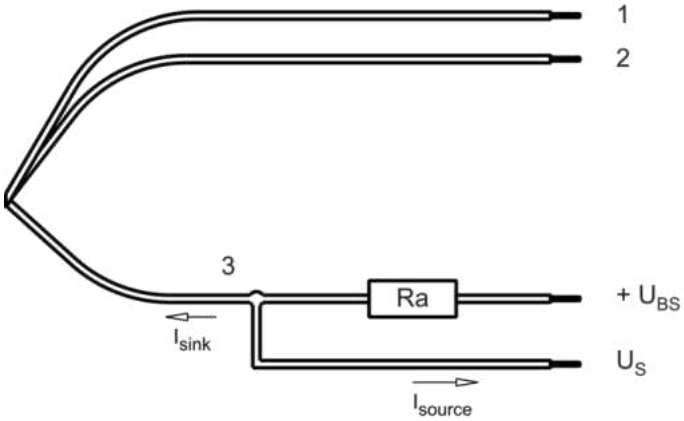
### 2.1 General

| | | |
|---|---|---|
| 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 size (AWG) | 22 | |
| Insulation diameter | 1,70 mm | |






| Wire | Color | Operation |
|---|---|---|
| 1 | red | + UB |
| 2 | blue | - GND |
| 3 | white | Tacho |

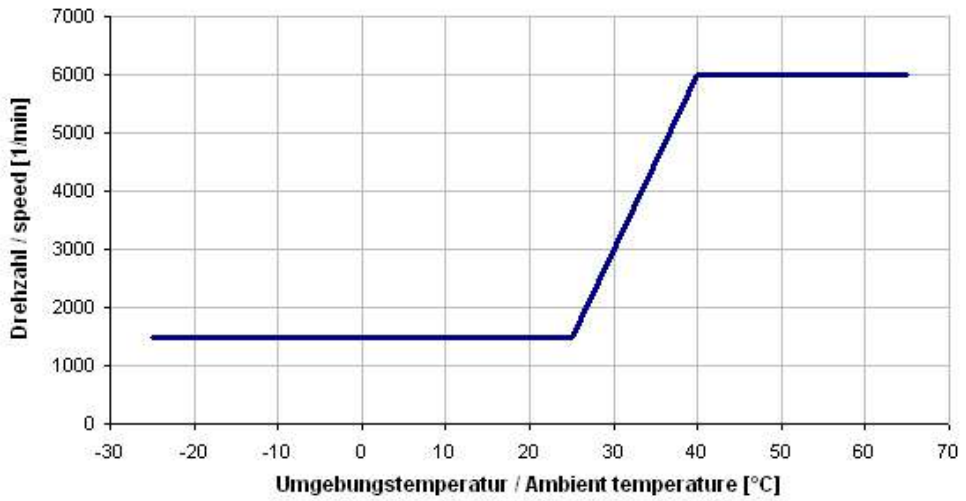
The auxilliaries shown on the schematic diagram (which are required for the intended use) are not part of our delivery.

## 3 Operating Data

### 3.1 Electrical Interface - Input

| | |
|---|---|
| Control input | Internal Temperature Sensor |

**Features**

| | |
|---|---|
| **Characteristics** |  |



**Speed control:**
by temperature characteristic Tu >= 25°C... <= 40°C

By temperature characteristic with internal NTC
(Temp.accuracy +- 3K)

**Recommendation:**
Speed characteristic curve should be reviewed at restart and in the current production as a random test!

### 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

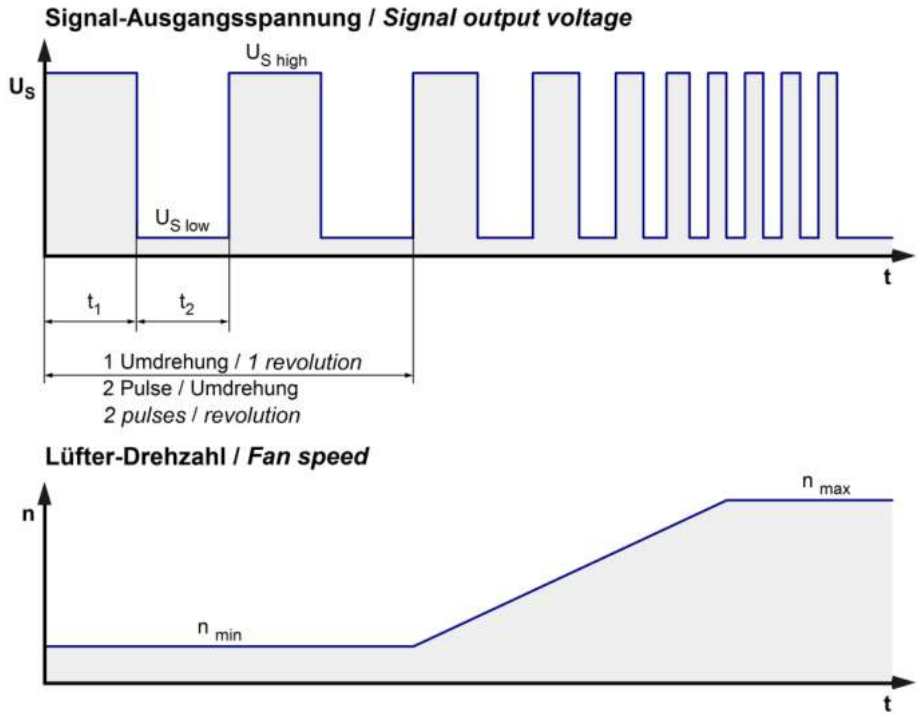
| Name | Condition | | |
|---|---|---|---|
| TU 0001 | TU: >= 40 °C | | |
| NTC 0001 | NTC 3 kOhm | | |

**)
**To note inrush current @ U nom:**
The internal electrolytic capacitor 120uF/50V has inrush current limitation,
the existing peak depends on ceramic capacitor 100nF.

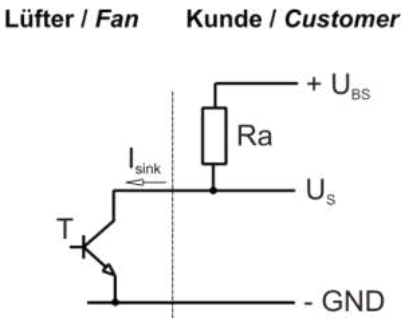
| Features | Condition | Symbol | Values | | |
|---|---|---|---|---|---|
| Voltage range | | U | 16 V | | 30 V |
| Nominal voltage | | $U_N$ | | 24 V | |
| Power consumption<br>Tolerance | Δp = 0<br>TU / NTC 0010 | P | 9,5 W<br>+- 12,5 % | 22,5 W<br>+- 12,5 % | 24,5 W<br>+- 12,5 % |
| Current consumption<br>Tolerance | Δp = 0<br>TU / NTC 0010 | I | 595 mA<br>+- 15 % | 940 mA<br>+- 15 % | 815 mA<br>+- 15 % |
| Speed<br>Tolerance | Δp = 0<br>TU / NTC 0010 | n | 4.550 1/min<br>+- 10 % | 6.000 1/min<br>+- 10 % | 6.000 1/min<br>+- 10 % |
| Starting current consumption | | | | 2.500 mA | |

### 3.3 Electrical Interface - Output

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




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

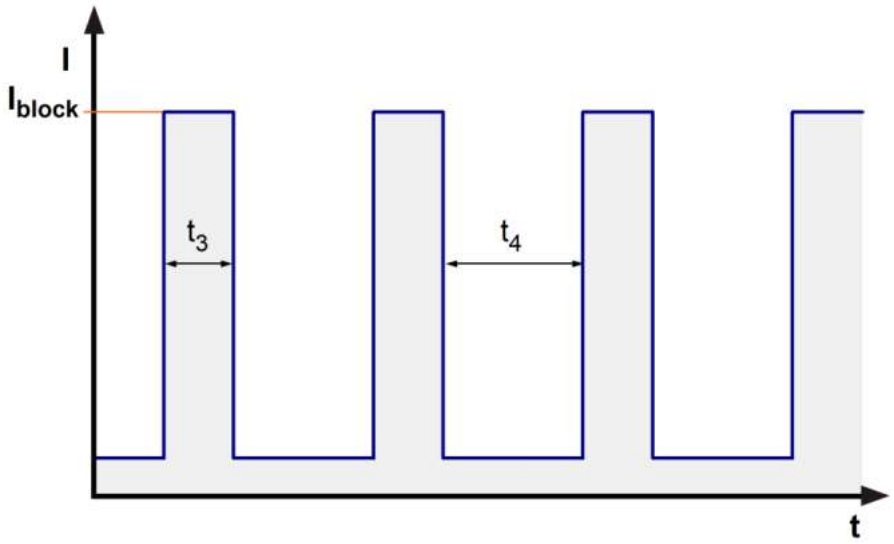



| Features | | Note | Values |
|---|---|---|---|
| Tacho operating voltage | $U_{BS}$ | | Min.: 5 V Max.: 60 V |
| Tacho signal Low | $U_{S\,low}$ | I sink: 2 mA | <= 0,4 V |
| Tacho signal High | $U_{S\,high}$ | I source: 0 mA | 60 V |
| Maximum sink current | $I_{sink}$ | | <= 20 mA |
| External resistor | | 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. 1.500 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)

**Current during braking of the rotor:**
Max. current when decelerate at Unom. = < 2.500mA peak

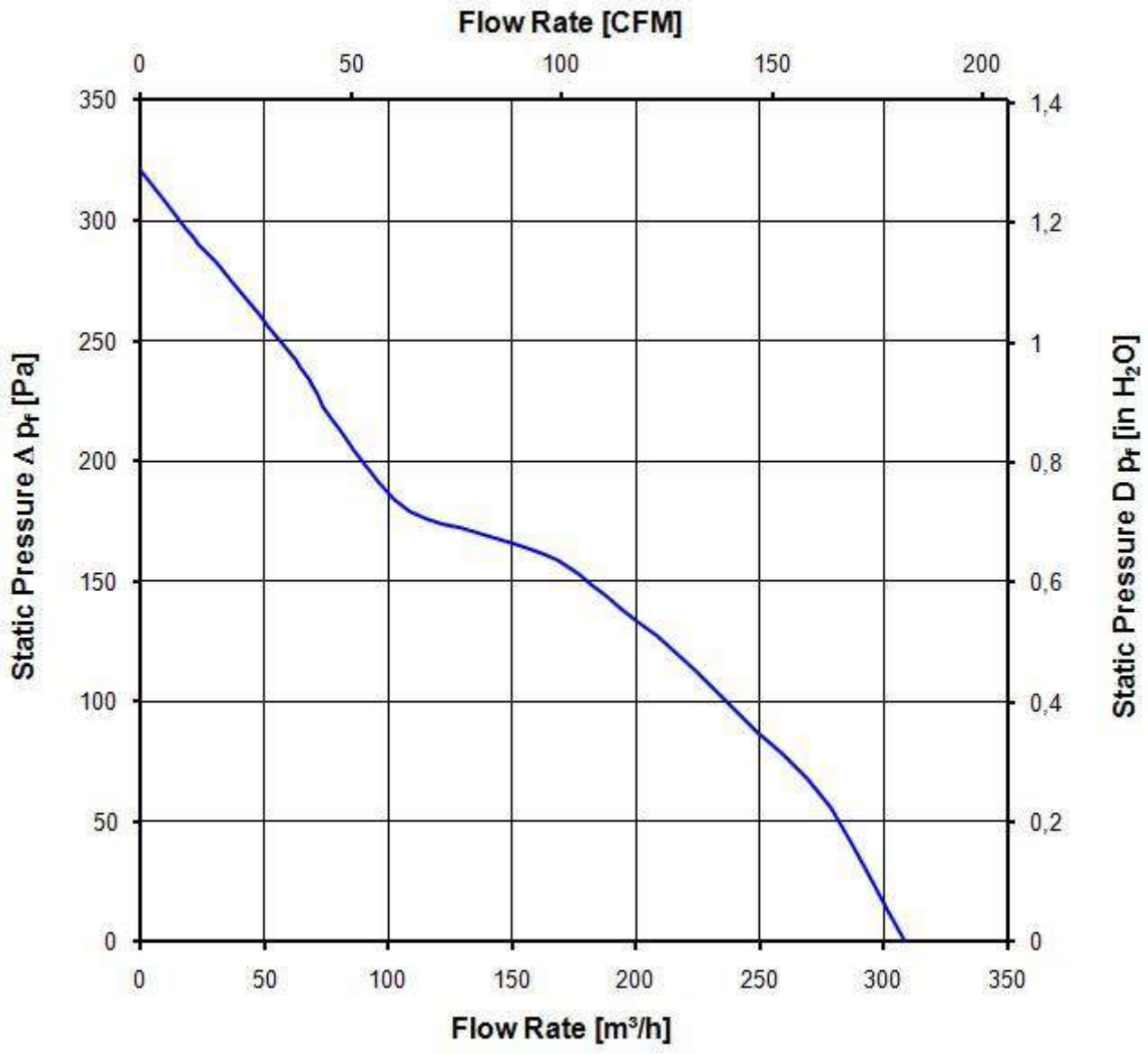
### 3.5 Aerodynamics

| | |
|---|---|
| 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°C +/- 3°C;<br>In the intake and outlet area should not be any solid obstruction within 0,5 m.<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 | TU >= 40 °C<br>NTC 3 kOhm | | |

| | | |
|---|---|---|
| Max. free-air flow (Δp = 0 / $\dot{V}$ = max.) | 310,0 m3/h | |
| Max. static pressure (Δp = max. / $\dot{V}$ =0) | 320 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 section 3.5 |

a.) Operation condition:

| | |
|---|---|
| at free air flow | |

## 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°C.<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>500 VAC / 1 Sec. | |
| Isolation resistance<br>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

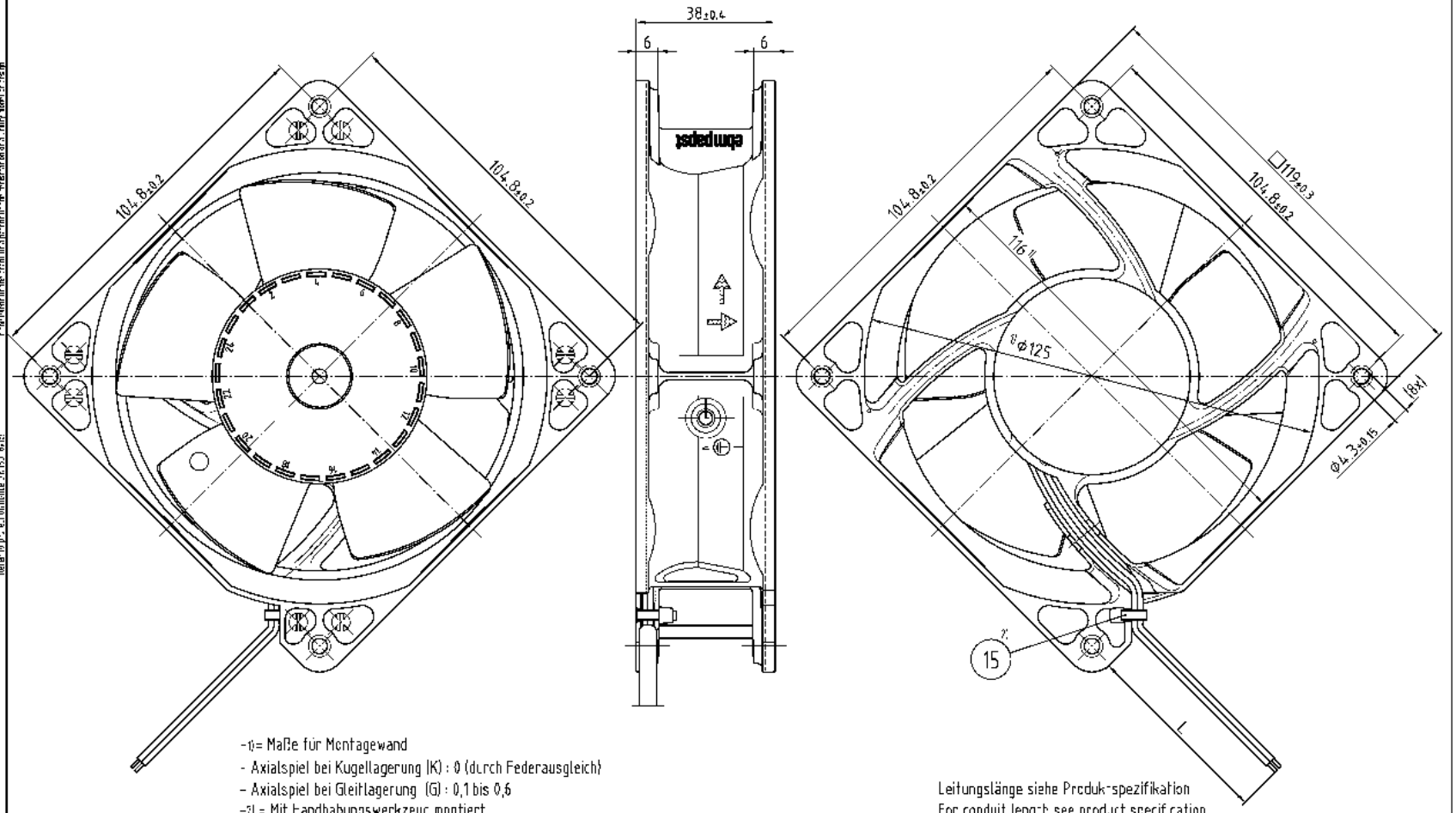
| | | |
|---|---|---|
| CE | EC Declaration of Conformity | Yes |
| EAC | Eurasian Conformity | Yes |
| UL | Underwriters Laboratories | Yes / UL507, Electric Fans |
| VDE | Association for Electrical, Electronic and Information Technologies | Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment |
| CSA | Canadian Standards Association | Yes / C22.2 No. 113 Fans and Ventilators |
| CCC | China Compulsory Certification | Not applicable |

The approval tests are observed to:
U approval max.:30,0 V @ TU approval max.: 65,0 °C

## 6 Reliability

### 6.1 General

| | | |
|---|---|---|
| Life expectancy L10 at TU = 40 °C | 65.000 h | |
| Life expectancy L10 at TU max. | 37.500 h | |
| Life expectancy L10 acc. to IPC 9591 at TU = 40 °C | 110.000 h | |




-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 Line 1/Vc Line 1 [m³] |
| SAP-Status/Scale | Kund.-Änderungs-Nr. | Art/CAD-Symbol-Marker | CAD Umgebung/ CAD Environment | | Gewicht/Mass [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 |
| ebm-papst St. Georgen GmbH & Co. KG | | | | Dokumentenart/Type of Document | Format/Size |

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