**Product Data Sheet** **9295420049**
VWEG172XKLUS
6318/2TDH4PR

ebmpapst

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**6318/2TDH4PR**

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## 1 General

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

## 2 Mechanics

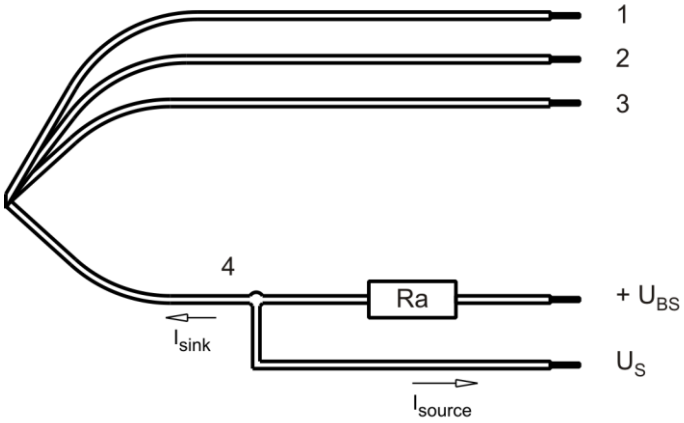
### 2.1 General

| | | |
|---|---|---|
| Depth | 51,0 mm | |
| Diameter | 172,0 mm | |
| Mass | 0,875 kg | |
| Housing material | Metal | |
| Impeller material | Plastic | |
| Max. torque when mounted across both mounting flanges<br>Screw size | Wire outlet corner: 600 Ncm<br>Remaining corners: 600 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 = 365 mm<br>+- 10,0 mm | |
| Tube length<br>Tolerance | S = 10 mm<br>+- 2,0 mm | |






| Wire | Color | Operation | Wire size | Insulation diameter |
|---|---|---|---|---|
| 1 | red | + UB | AWG 18 | 2,2 mm |
| 2 | blue | - GND | AWG 18 | 2,2 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

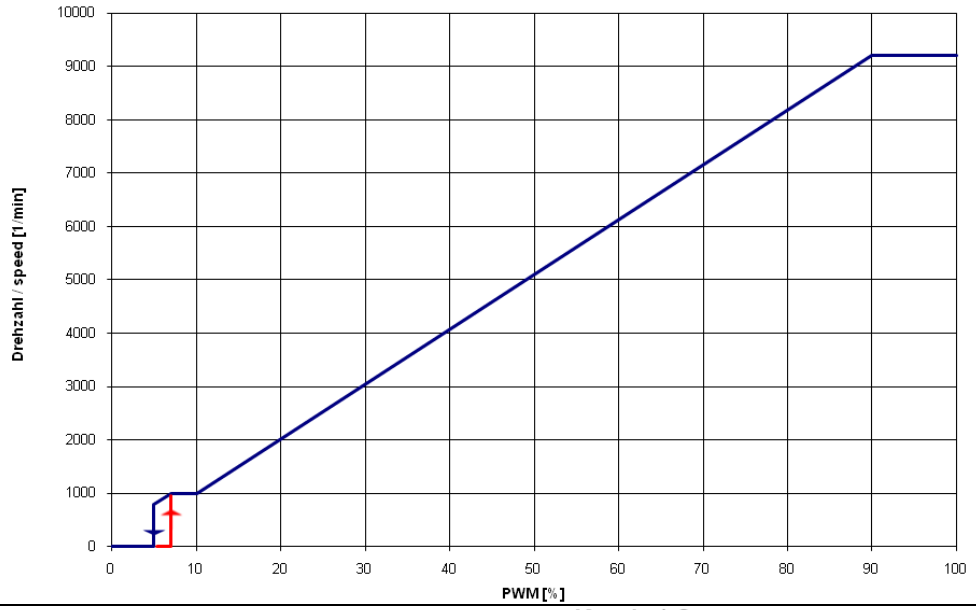
### 3.1 Electrical Interface - Input

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

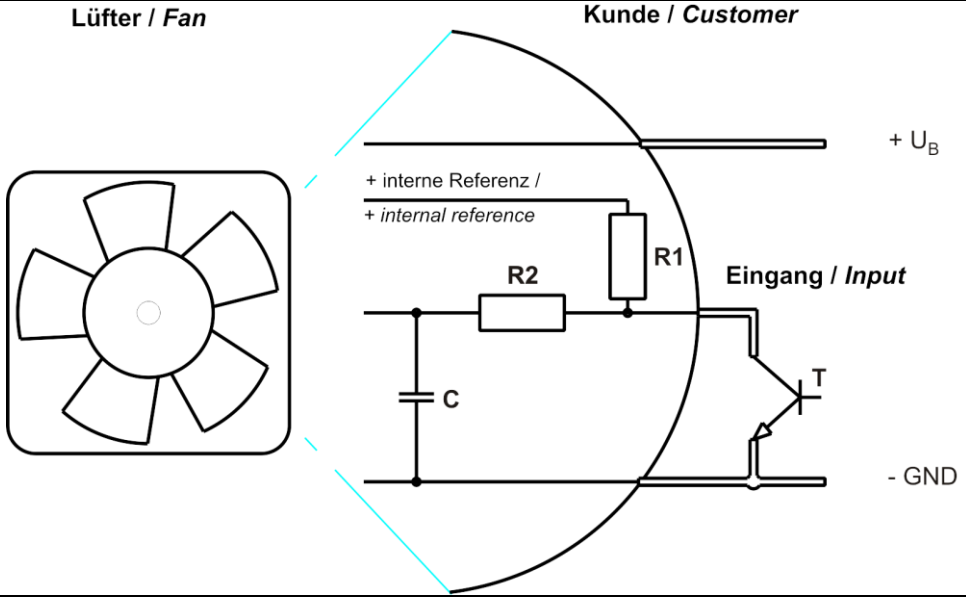
**Features**

| | | |
|---|---|---|
| Inpute type | Open collector | |
| PWM - Frequency | | 1 kHz - 20 kHz<br>typical: 2 kHz |

**Characteristics**




**Schematics**




The shown pull-up resistor R1 to the internal reference voltage (+5V) has 4.7kOhm.
**Transistor Requirements:**
VCE max. >= 12V; Isink max > 5mA; VCEsat < 0,15V

**Information to the curve:**

| | |
|---|---|
| 0% - <=7% PWM: | 0 1/min (Fan off) |
| 7% PWM: | 1.000 1/min (Start-up, comming from 0% PWM) |
| 7% - 10 % PWM: | 1.000 1/min (corresp. to min fan speed) |
| 10% - 90% PWM: | Linear increasing curve |
| 90% - 100% PWM: | 9.200 1/min (corresp. to max fan speed) |
| 5% PWM: | 800 1/min or 0 1/min (Fan turns off, comming from 100% PWM) |

### 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 chapter aerodynamics)
I: corresp. to arithm. mean current value

| Name | Condition | | |
|---|---|---|---|
| PWM 0001 | PWM: 95 %; f: 2 kHz | | |

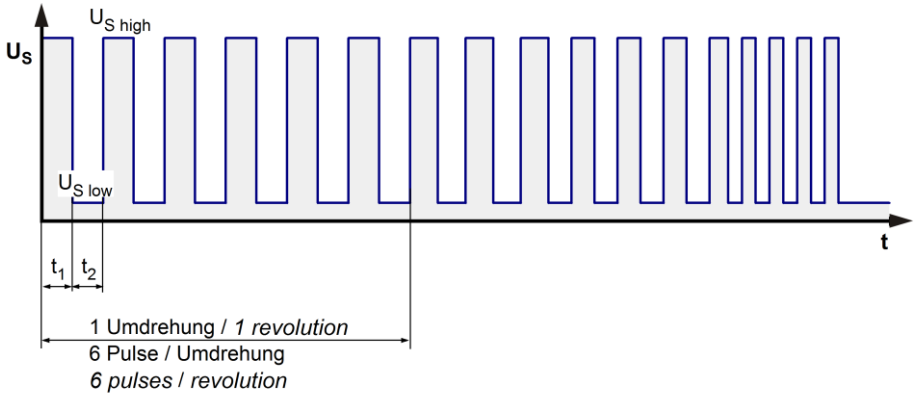
**>90% PWM; f = 2 kHz or broken lead wire (open control input)**

| Features | Condition | Symbol | Values | | |
|---|---|---|---|---|---|
| Voltage range | | U | 36 V | | 72 V |
| Nominal voltage | | $U_N$ | | 48 V | |
| Power consumption<br>Tolerance | Δp = 0<br>PWM 0010 | P | 106 W<br>+- 15 % | 150 W<br>+- 10 % | 160 W<br>+- 10 % |
| Current consumption<br>Tolerance | Δp = 0<br>PWM 0010 | I | 2.800 mA<br>+- 15 % | 3.100 mA<br>+- 10 % | 2.200 mA<br>+- 10 % |
| Speed<br>Tolerance | Δp = 0<br>PWM 0010 | n | 8.200 1/min<br>+- 7,5 % | 9.200 1/min<br>+- 5 % | 9.200 1/min<br>+- 5 % |

### 3.3 Electrical Interface - Output

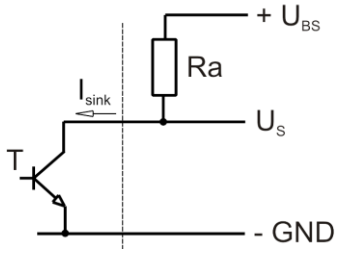
| | |
|---|---|
| Tacho type | /2 (open collector) |

**Signal-Ausgangsspannung / *Signal output voltage***

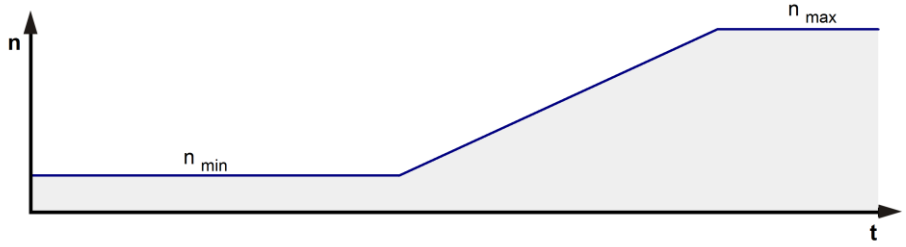



$$Ra = \frac{U_{BS} - U_{S\,low}}{I_{sink}}$$

**Lüfter / *Fan*** **Kunde / *Customer***




**Lüfter-Drehzahl / *Fan speed***



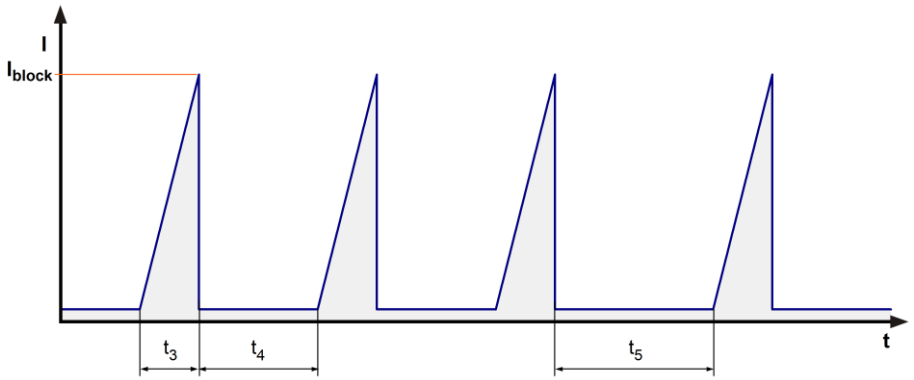

| **Features** | | **Note** | **Values** |
|---|---|---|---|
| Tacho operating voltage | $U_{BS}$ | | <= 60 V |
| Tacho signal Low | $U_{S\,low}$ | I sink: 2 mA | <= 0,4 V |
| Tacho signal High | $U_{S\,high}$ | I source: 0 mA | <=60,0 V |
| Maximum sink current | $I_{sink}$ | | <= 20 mA |
| External resistor | | External resistor Ra from UBS to US required. All voltages measured to GND. | |
| Tacho frequency | | (6 x n) / 60 | 920 Hz @ 9.200 1/min |
| Tacho isolated from motor | | No | |
| Slew rate | | | => 0,5 V/us |

n = revolutions per minute (1/min)

### 3.4 Electrical Features

| | | |
|---|---|---|
| Electronic function | Speed-Controlled | |
| Reversed polarity protection<br>Max. residual current at $U_N$ | P-CH FET<br>$I_F$ <= 5 mA | |
| Locked rotor protection | Auto restart | |
| Locked rotor current at $U_N$ | $I_{block}$ approx. 1.500 mA | |
| Clock signal at locked rotor<br>Extended Downtime | $t_3$ / $t_4$ typical: 1,5 s / 10,0 s<br>$t_5$: 40 s after 4 start-up tests | |
| Internal fuse | Littelfuse NANO2 > Very Fast-Acting > 451/453 Series<br>10A / 125V (Art.No.: 0451010.MRL) | |
| Voltage control *) | Fan turns on at $U_B$ > 32 V or < 76 V<br>Fan turns off at $U_B$ < 30 V or > 78 V | |

*) This fan has an undervoltage and overvoltage control circuit integrated which turns the motor off if the voltage is out of range.




First locked rotor off time is reduced to 3 seconds.

This fan has a startup delay of 2 seconds after applying supply voltage.

**Start-up current @ 48 V (I = 1A/div ; t = 2s/div)**
**Running current @ 48 V (I = 1A/div ; t = 500us/div)**
**Locked rotor current @ 48 V (I = 500mA/div ; t = 500ms/div)**

### 3.5 Data According ErP Directive

| | |
|---|---|
| Installation / Efficency category | A / static |
| Speed control | integrated |
| Specific ratio | 1,00569 |
| Target overall efficiency 2015 | 29,8 % |
| Overall efficiency | 42,9 % |
| Efficiency grade | 40 |
| Power input | 245 W |
| Speed | 9.360 1/min |

All values measured in optimum energy efficiency point.

Productiondatecode is printed on the fan label.

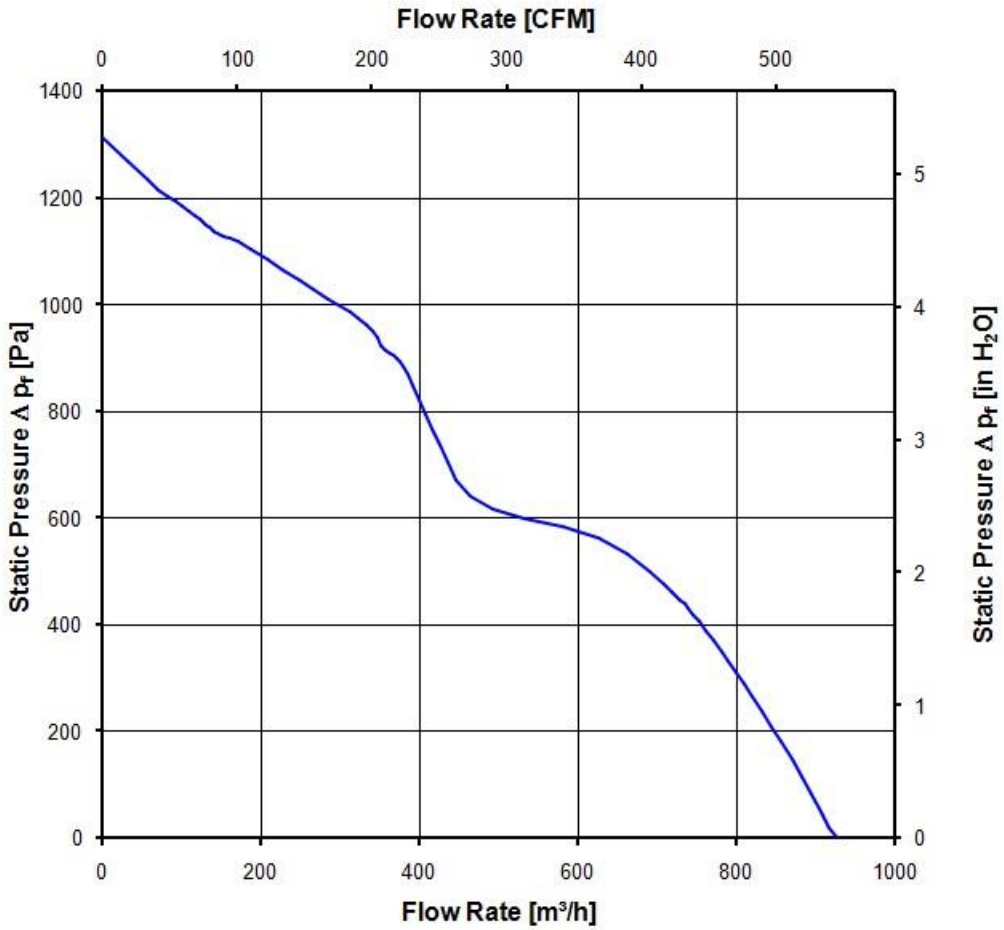
### 3.6 Aerodynamics

| | |
|---|---|
| Measurement conditions: | Measured with a double chamber intake rig acc. to DIN EN ISO 5801.<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. 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:

| | | | |
|---|---|---|---|
| 9.200 1/min at free air flow | PWM 95 %; f: 2 kHz | | |

| | | |
|---|---|---|
| Max. free-air flow (Δp = 0 / $\dot{V}$ = max.) | 930 m3/h | |
| Max. static pressure (Δp = max. / $\dot{V}$ =0) | 1.310 Pa | |



### 3.7 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 semianechoic chamber with a background noise level of Lp(A) < 5 dB(A)<br>For further measurement conditions see chapter aerodynamics. |

a.) Operation condition:

| | | | |
|---|---|---|---|
| 9.200 1/min at free air flow | PWM 95 %; f: 2 kHz | | |

| | | |
|---|---|---|
| Optimal operating point | 910 m3/h @ 34 Pa | |
| Sound power level at the optimal operating point | 8,6 bel(A) | |
| Sound pressure level at free air flow, measured in rubber bands | 75,0 dB(A) | |

## 4 Environment

### 4.1 General

| | | |
|---|---|---|
| Min. permitted ambient temperature TU min. | -20 °C | |
| Max. permitted ambient temperature TU max. | 75 °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, cyclic; according to DIN EN 60068-2-30, 6 cycle | |
| Water exposure | None | |
| Dust requirements | Dust check; according to DIN EN 60068-2-68, 6g/m2d, 1 day | |
| Salt fog requirements | None | |

Permitted application area:
The product is for the use in sheltered rooms with limited controlled temperature. Occasionally condensed water is allowed. Direct exposure to water must be avoided. Saline ambient conditions must be avoided.

Pollution degree 2 (according DIN EN 60664-1)
It occurs only non-conductive pollution. Occassionally, temporary conductivity caused by condensation occurs.

Please require severity levels and specification parameters from the responsible development departments.

## 5 Safety

### 5.1 Electrical Safety

| | | |
|---|---|---|
| Dielectric strength<br>DIN EN 62368 and DIN EN 60335<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. | 1000 VAC / 1 Min.<br><br>1700 VDC / 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 / 1,5 mm | |
| Protection class | I | |

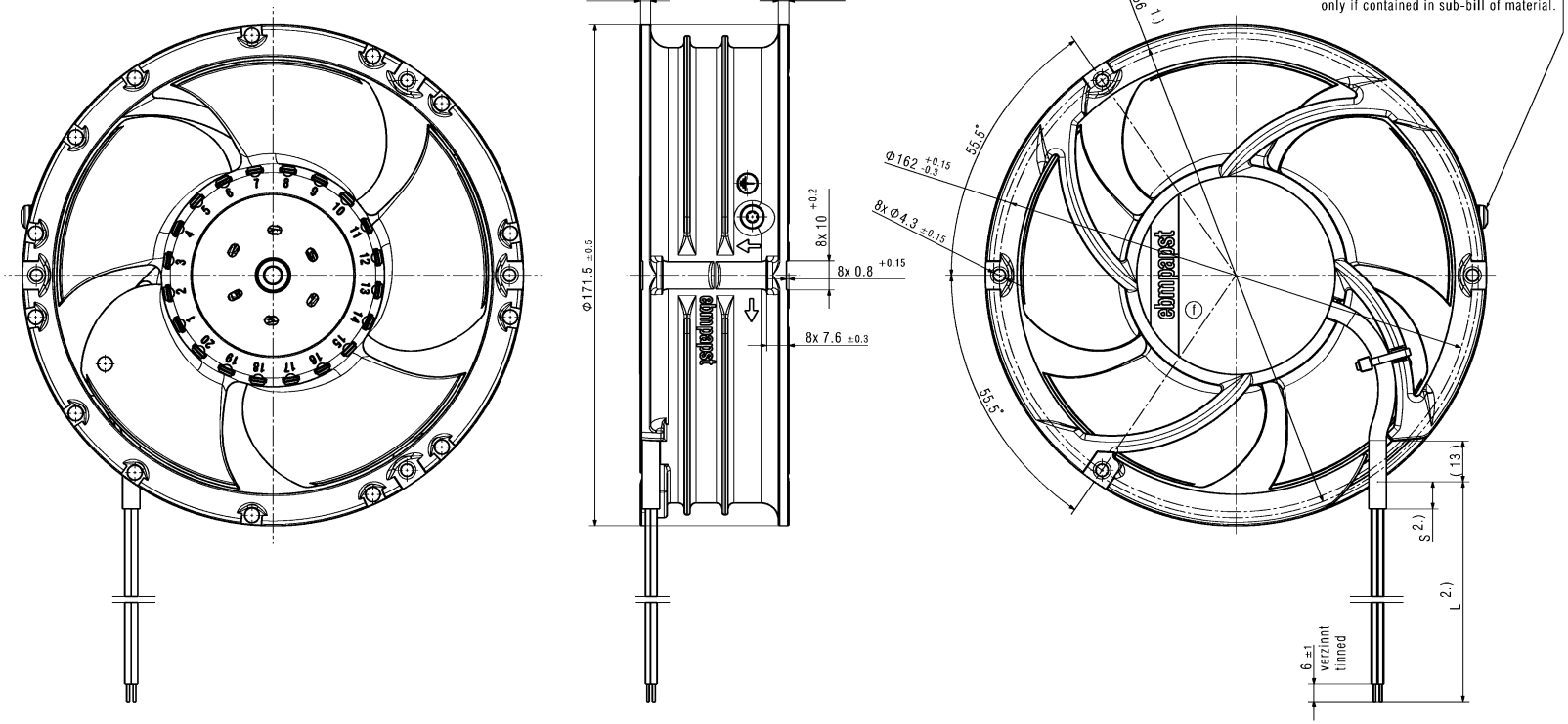
### 5.2 Approval Tests

| | | |
|---|---|---|
| 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 / C22.2 No. 113 Fans and Ventilators |
| CCC | China Compulsory Certification | Yes / GB 12350 Safety Requirements for small Power Motors |

## 6 Reliability

### 6.1 General

| | | |
|---|---|---|
| Life expectancy L10 at TU = 40 °C | 52.500 h | |
| Life expectancy L10 at TU max. | 20.000 h | |
| Life expectancy L10 acc. to IPC 9591 at TU = 40 °C | 87.500 h | |




Erdungsschraube: Duo-Taptite
nach DIN 7500, CM 4x8, Torx,
nur wenn in Stückliste enthalten.

Grounding screw: Duo-Taptite
according to DIN 7500, CM 4x8, Torx,
only if contained in sub-bill of material.

1.) Maße für Montageausschnitt.
2.) Anzahl und Länge der Litzen sowie Länge des Schlauch siehe Produktspezifikation.

- Axialspiel der Kugellager mit Feder spielfrei gelagert.

1.) Measures for mounting cut out.
2.) Length and number of wires and length of tube see product specification.

- Ball bearing without clearance by a pre-load spring.

| | | | | | |
|---|---|---|---|---|---|
| Dokument-Status / Document-State | CATIA-Version/ CATIA-Version | CAD-Umgebung/ CAD-Environment | Werkstoff / Material: | Volumen / Volume (m³): | |
| Änd.-Nr./ Change-No. | 035540001 GPK006 | | | Gewicht / Mass (g): | |
| Toleranzen / Tolerances: | 3D-Referenzmodell / 3D-Referenzmodell | | Titel / Title: | | |
| | Datum | Name | | | |
| Allgemeintoleranzen / Gen. Tolerances: | Bearb./ Drawn | | Zchg.-Nr./ Drawing No: | Ers.f.Zchg. / Replaces: | |
| | Gepr./ Checked | | | | |
| | Freigb./ Release | | | | |
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