# Product Data Sheet RER175-42/14/2TDMLPU

ebmpapst

The engineer's choice



GREEN TECH

# RER175-42/14/2TDMLPU

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## 1 General

| | | |
|---|---|---|
| Fan type | Blower without chassis and without intake nozzle | |
| Rotating direction looking at rotor | Clockwise | |
| Airflow direction | Air in axially, Air out radially | |
| Bearing system | Stainless steel bearing | |
| Mounting position - shaft | Any | |

## 2 Mechanics

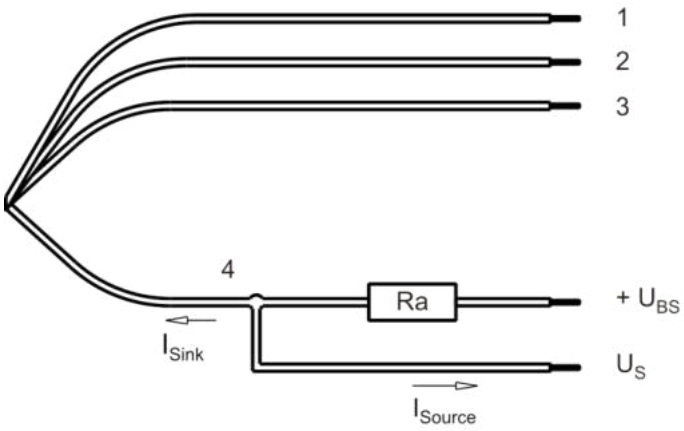
### 2.1 General

| | | |
|---|---|---|
| Depth | 69 mm | |
| Diameter | 175 mm | |
| Mass | 0,775 kg | |
| Housing material | Metal | |
| Impeller material | Plastic | |

### 2.2 Connections

| | | |
|---|---|---|
| Electrical connection | Wires | |
| Lead wire length<br>Tolerance | L = 425 mm<br>+- 10 mm | |
| Tube length<br>Tolerance | S = 115 mm<br>+- 5,0 mm | |
| Wire size (AWG) | 22 | |
| Insulation diameter | 1,70 mm | |






| Wire | Color | Operation |
|---|---|---|
| 1 | red | + UB |
| 2 | blue | - GND |
| 3 | violet | PWM |
| 4 | 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

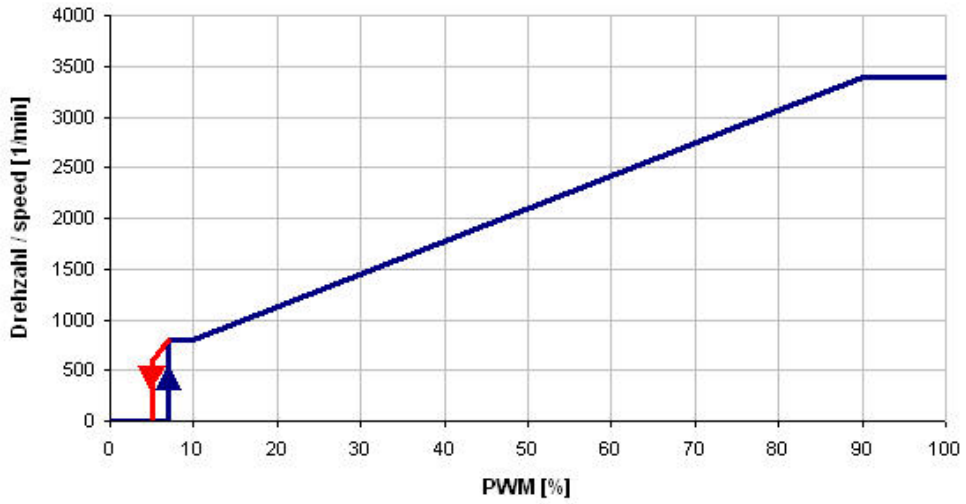
### 3.1 Operating Data - Electrical Interface - Input

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

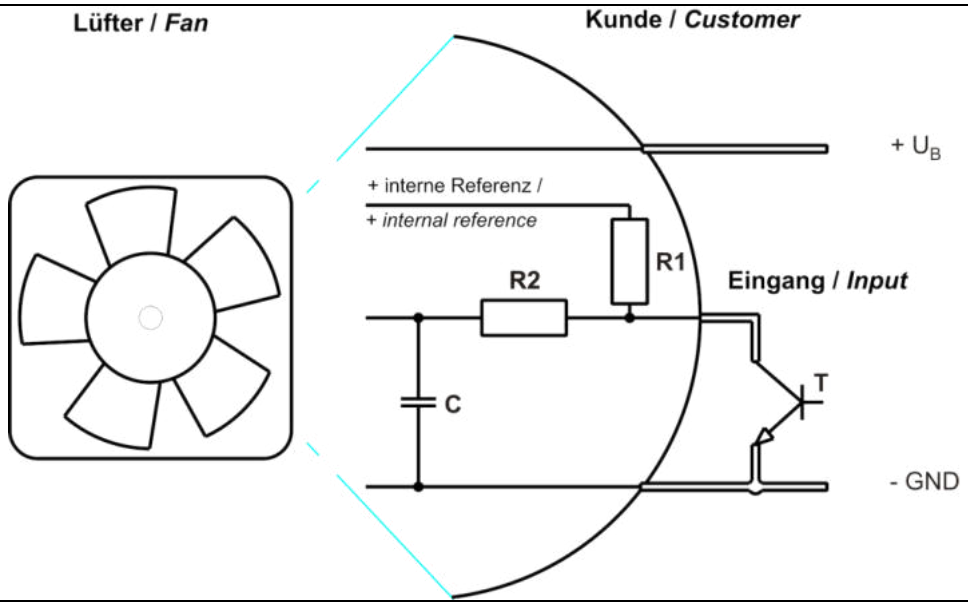
**Features**

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

**Characteristics**




**Schematics**




**Speed control:**
By Puls width modulation (PWM) 0 ... 100%
Open collector in relation to signal-ground

**Information to the curve:**

| | |
|---|---|
| 0 % - 7% PWM: | 0 1/min |
| 7 % PWM: | 800 1/min (Fan on, comming from 0% PWM) |
| 7 % - 10% PWM: | 800 1/min (corresponding to min. speed) |
| 10 % - 90% PWM: | linear increasing curve |
| 90 % - 100% PWM: | 3.400 1/min (corresponding to max. speed) |
| 7 % - 5 % PWM: | linear decreasing curve (comming from 100% PWM) |
| 5 % PWM: | 600 1/min or 0 1/min (Fan 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.

| | |
|---|---|
| Measurement setup: | Measured between two steel plates |
| Steel plate: | 180 mm x 180 mm |
| Intake nozzle: | D: 125,5 mm; R: 10 mm |
| Distance between bottom and top plate: | 80 mm |
| Overlapping impeller / nozzle: | 2 mm |

$\Delta p = 0$: corresp. to free air flow (see section 3.5)
I: corresp. to arithm. mean current value

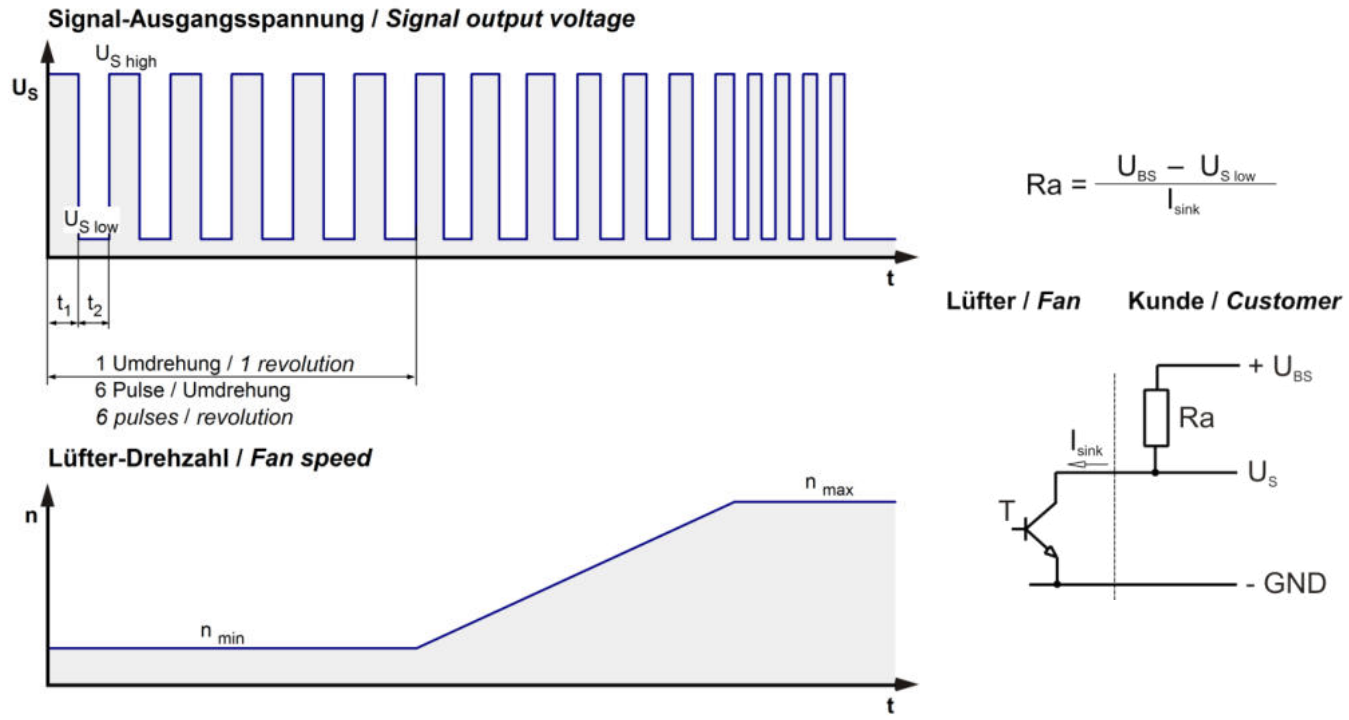
| Name | Condition | | |
|---|---|---|---|
| PWM 0001 | PWM: 100 %; f: 2 kHz | | |

**100% PWM; f = 2 kHz or broken lead wire (open control input)**

| Features | Condition | Symbol | Values | | |
|---|---|---|---|---|---|
| Voltage range | | U | 16 V | | 30,0 V |
| Nominal voltage | | $U_N$ | | 24,0 V | |
| Power consumption<br>Tolerance | $\Delta p = 0$<br>PWM 0010 | P | 35,2 W<br>+- 10,0 % | 48,0 W<br>+- 10,0 % | 48,0 W<br>+- 10,0 % |
| Current consumption<br>Tolerance | $\Delta p = 0$<br>PWM0010 | I | 2.200 mA<br>+- 10,0 % | 2.000 mA<br>+- 10,0 % | 1.600 mA<br>+- 10,0 % |
| Speed<br>Tolerance | $\Delta p = 0$<br>PWM 0010 | n | 3.100 1/min<br>+- 7,5 % | 3.400 1/min<br>+- 5,0 % | 3.400 1/min<br>+- 5,0 % |

### 3.3 Operating Data - Electrical Interface - Output

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




**Please note:**
At zero speed the tacho signal is at a static HIGH. It will be also HIGH when the fan is still spinning, but the speed control signal is set to zero speed already.
The tacho signal is only activated after the start-up is completed.

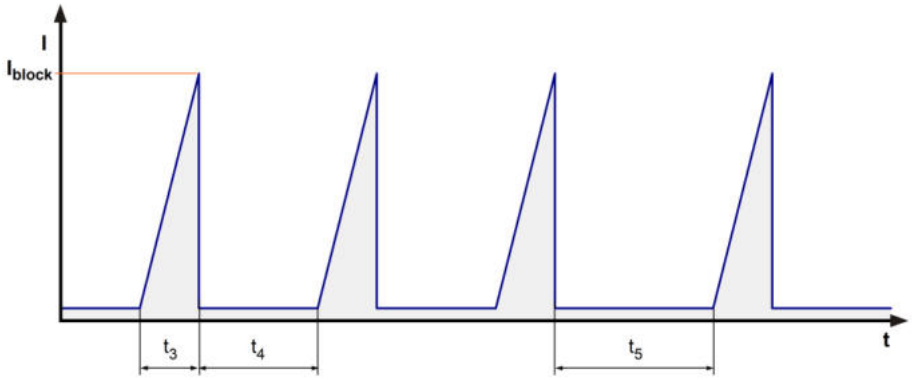
| Features | | Note | Values |
|---|---|---|---|
| Tacho operating voltage | $U_{BS}$ | | <= 60,0 V |
| Tacho signal Low | $U_{S\ low}$ | I sink: 2 mA | <=0,4 V |
| Tacho signal High | $U_{S\ high}$ | I source: 0 mA | <=60,0 V |
| Maximum sink current | $I_{sink}$ | | <= 20 mA |
| External resistor |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

n = revolutions per minute (1/min)

**Note to the tacho-frequency:** (6 Pulse per revolution!)

### 3.4 Electrical Features

| | | |
|---|---|---|
| Electronic function | Speed-Controlled | |
| Reversed polarity protection<br>Max. residual current at $U_N$ | Rectifying diode<br>$I_F$ <= 5 mA | |
| Locked rotor protection | Auto restart | |
| Locked rotor current at $U_N$ | $I_{block}$ approx. 3.400 mA | |
| Clock signal at locked rotor | $t_3$ / $t_4$ typical: 6,5 s / 10 s | |




**Locked rotor signal t5:**
After 4 failed start-ups there is an extended timeout of 40 s.

### 3.5 Aerodynamics

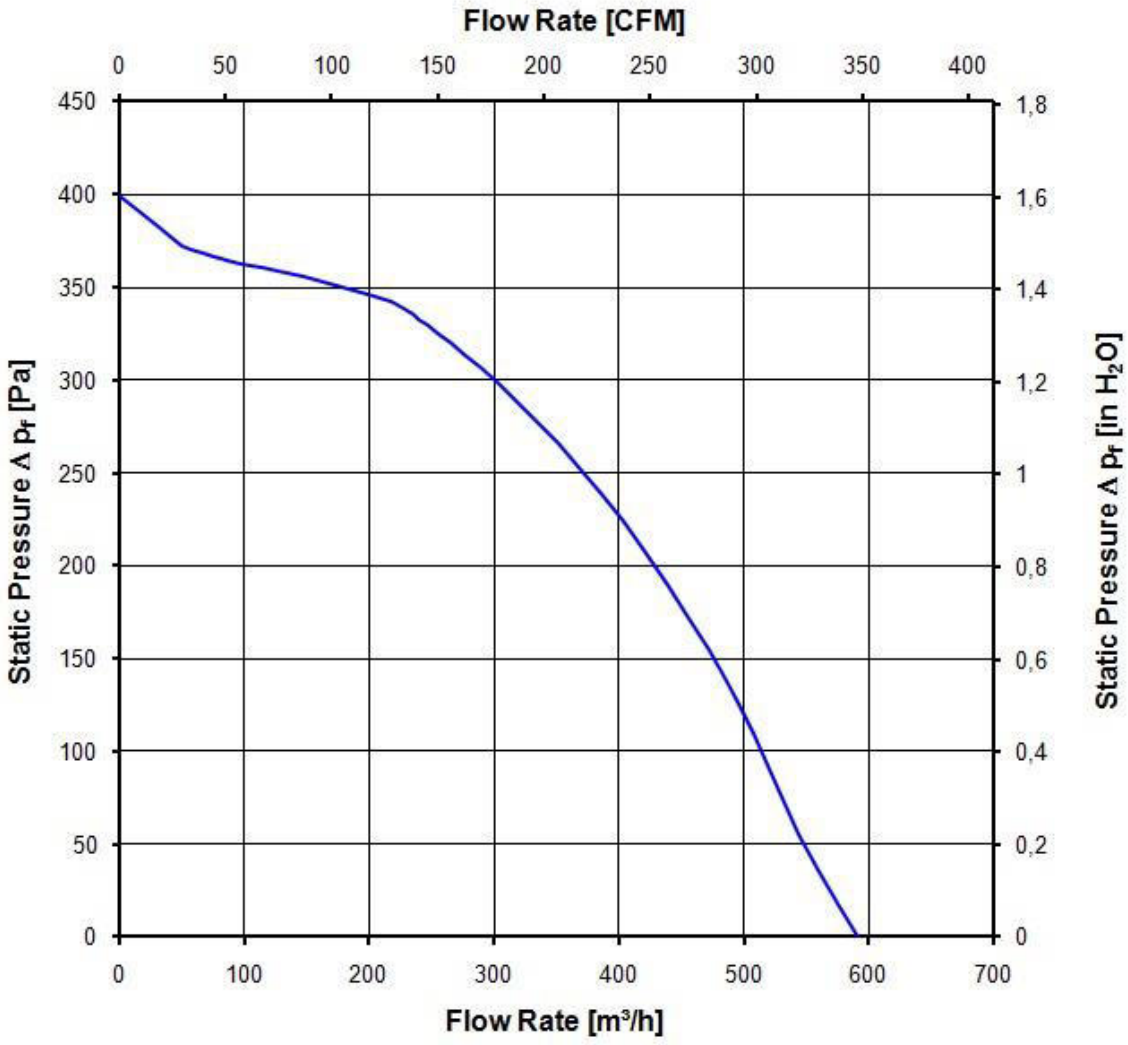
| | |
|---|---|
| Measurement conditions: | Measured with a double chamber intake rig acc. to DIN EN ISO 5801.<br>Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C;<br>In the intake and outlet area should not be any solid obstruction within 0,5 m.<br>The information is only valid under the specified 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. |

| | |
|---|---|
| Measurement setup: | Measured between two steel plates |
| Steel plate: | 180 mm x 180 mm |
| Intake nozzle: | D: 125,5 mm; R: 10 mm |
| Distance between bottom and top plate: | 80 mm |
| Overlapping impeller / nozzle: | 2 mm |

a.) Operation condition:

| | | | |
|---|---|---|---|
| 3.400 1/min at free air flow | PWM 100 %; f: 2 kHz | | |

| | | |
|---|---|---|
| Max. free-air flow (Δp = 0 / V̇ = max.) | 590,0 m3/h | |
| Max. static pressure (Δp = max. / V̇ =0) | 400 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:

| | | | |
|---|---|---|---|
| 3.400 1/min at free air flow | PWM 100 %; f: 2 kHz | PWM min.: ; f: | PWM max.:; f: |

| | | |
|---|---|---|
| Optimal operating point | 435,0 m3/h @ 176 Pa | |
| Sound power level at the optimal operating point | 7,3 bel(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

| | | |
|---|---|---|
| IP-protection type (certified) | IP 68 (for fan only, not for connector if applicable) **) | |
| Humidity requirements | humid temperature, cyclic; according to DIN EN 60068-2-38, 10 cycle and condensation water check; according to DIN EN ISO 6270-2, 14 days | |
| Salt fog requirements | tbd | |

Permitted application area:
The product is for the use in partial sheltered rooms or open, roofed areas. Direct exposure to water is allowed provided that this does not prevent the normal operation. Saline ambient conditions must be avoided.

Pollution degree 3 (according DIN EN 60664-1)
It occurs conductive pollution or dry non-conductive pollution which becomes conductive due to condensation.

**) The specification of the IP protection refers to the conditions mentioned in certification of the fan. The above mentioned short description of the protection scope is not final. For detailed information of the respective protection scope and definitions, see certification as well as DIN EN 60529 (protection by housings) and ISO 20653 (for vehicles) with the letter K.

**Short description of the IP-protection type:**
Solid particle Protection: Dust tight.
Protection against deliberate contact: Protected against contact to hazardous parts with a wire.
Protection against water: The fan test according to IP68 (Based on IEC 60529), is conducted in non-operating mode. The fan is tested by a complete immersion in water for a period of 2h at a water-level of 1,2m. Electrical connections are not immersed since they are customer specific.

# 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

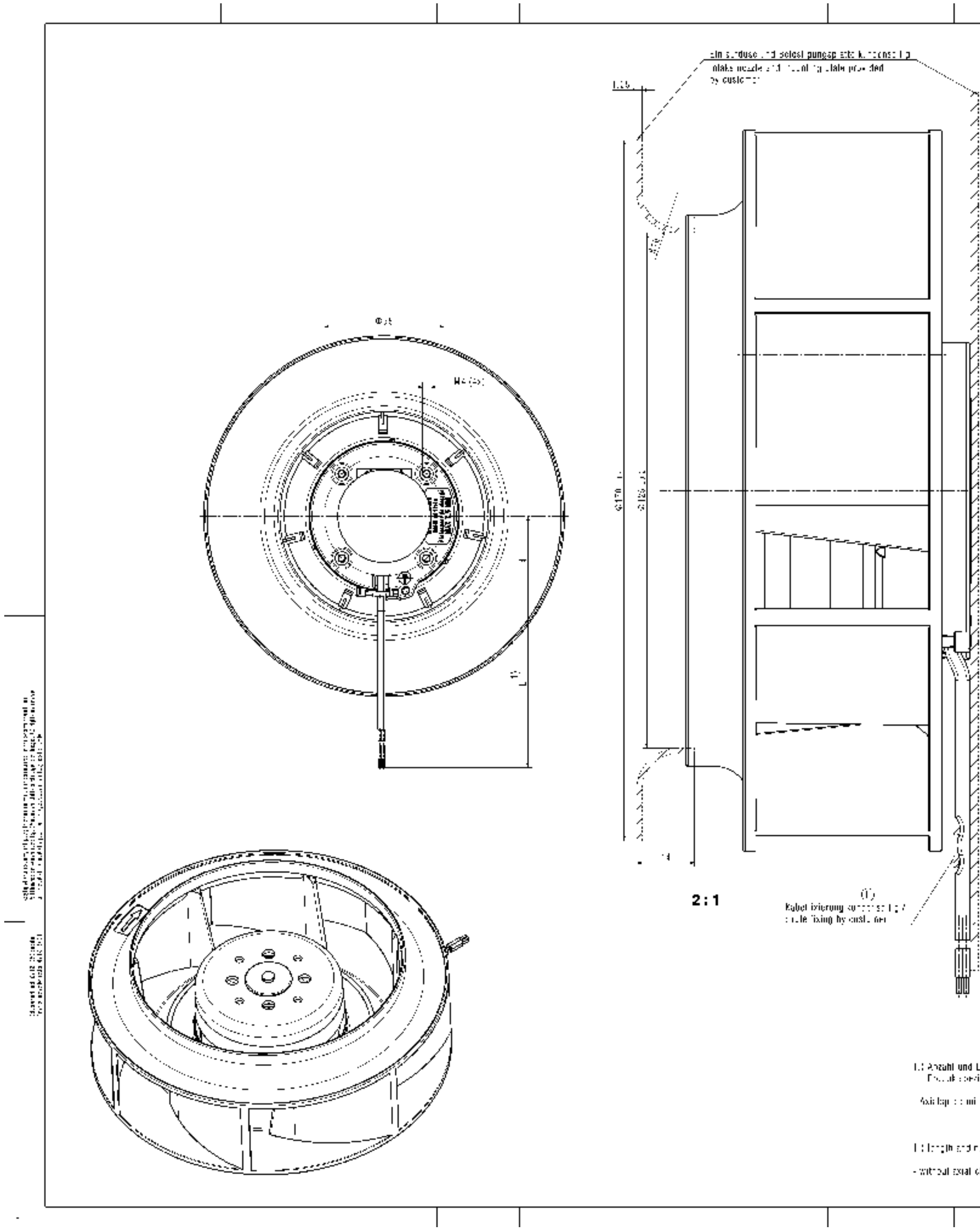
| | | |
|---|---|---|
| CE | EC Declaration of Conformity | Yes |
| EAC | Eurasian Conformity | Yes |
| UL | Underwriters Laboratories | Yes / UL507, Electric Fans |
| VDE | Association for Electrical, Electronic and Information Technologies | Yes / Approval acc. to EN 60950 (VDE 0805) - Information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

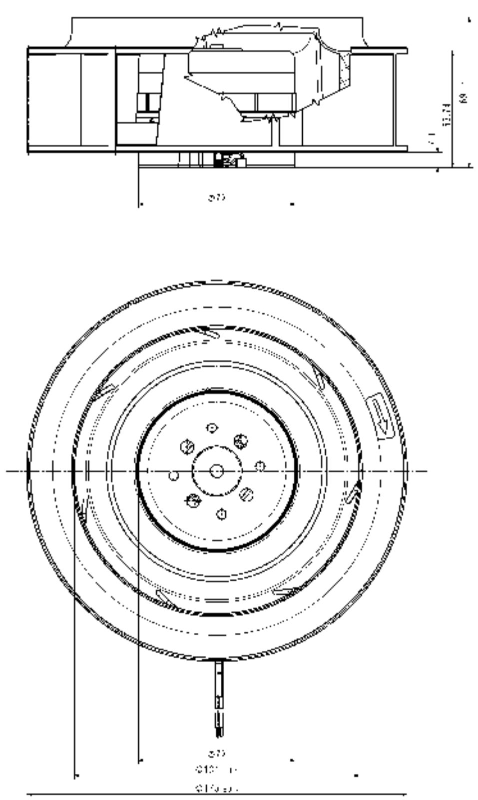
The approval tests are observed to:
U approval max.:30,0 V @ TU approval max.: 65,0 °C

# 6 Reliability

## 6.1 General

| | | |
|---|---|---|
| Life expectancy L10 at TU = 40 °C | 72.500 h | |
| Life expectancy L10 at TU max. | 40.000 h | |
| Life expectancy L10 acc. to IPC 9591 at TU = 40 °C | 122.500 h | |



1.) Anzahl und Länge der Litzen sowie Länge des Schlauches ab Flanschrand siehe Produktspezifikation

Axialspiel mit Federscheibe verspannt

1.) length and number of wires and length of tube from flange edge see design specification

- without axial clearance by a pre-loaded spring

Bei Übergabe von CAD-Daten bleibt diese Zeichnung bindendes Dokument. Bei Unstimmigkeiten gelten die Angaben in der Zeichnung.

In case of handed over CAD data is this drawing binding document. In event of discrepancies the specifications in this drawing are binding.

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