# Product Data Sheet REF100-11/12

ebmpapst

The engineer's choice



GREEN TECH

**REF100-11/12**

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## 1 General

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

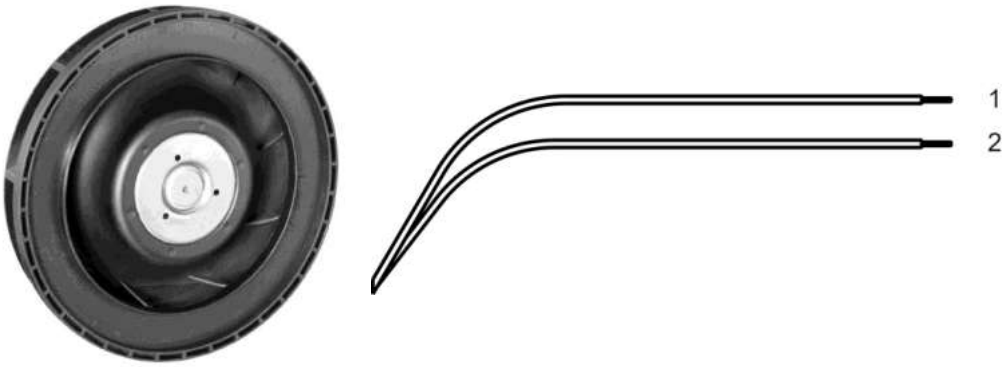
## 2 Mechanics

### 2.1 General

| | | |
|---|---|---|
| Depth | 25,0 mm | |
| Diameter | 104,0 mm | |
| Mass | 0,165 kg | |
| Housing material | | |
| Impeller material | Plastic | |

### 2.2 Connections

| | | |
|---|---|---|
| Electrical connection | Wires | |
| Lead wire length<br>Tolerance | L = 325 mm<br>+- 10,0 mm | |
| Wire size (AWG) | 22 | |
| Insulation diameter | 1,70 mm | |




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

## 3 Operating Data

### 3.1 Electrical Operating Data

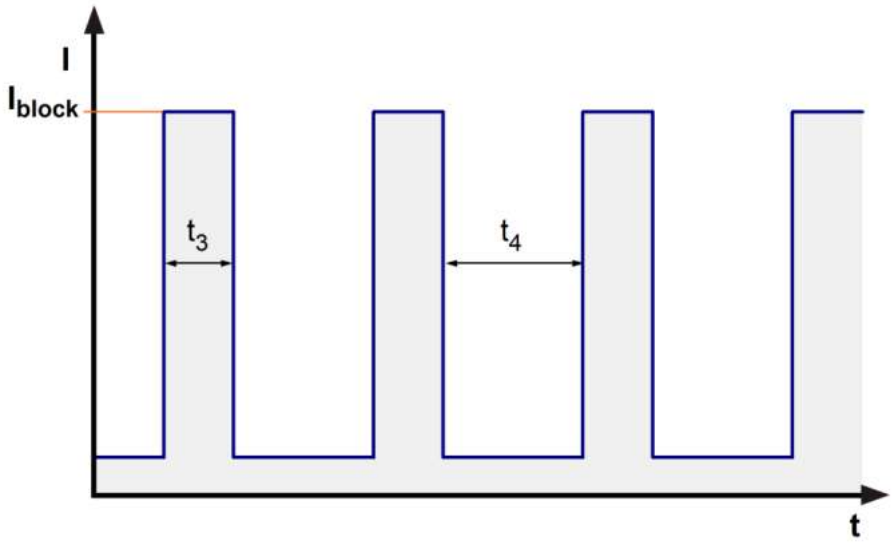
| | |
|---|---|
| Measurement conditions: | Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C; Motor axis horizontal; warm-up time before measuring 5 minutes (unless otherwise specified).<br>In the intake and outlet area should not be any solid obstruction within 0,5 m. |

| | |
|---|---|
| Measurement setup: | Measured between two steel plates |
| Steel plate: | 127 mm x 127 mm |
| Intake nozzle: | D: 70 mm; R: 3,5 mm |
| Distance between bottom and top plate: | 25 mm |
| Overlapping impeller / nozzle: | 2 mm |

Δp = 0: corresp. to free air flow (see section 3.5)
I: corresp. to arithm. mean current value

### 3.2 Electrical Features

| | | |
|---|---|---|
| Electronic function | None | |
| 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. 500 mA | |
| Clock signal at locked rotor | $t_3$ / $t_4$ typical: 0,38 s / 8,2 s | |



### 3.3 Aerodynamics

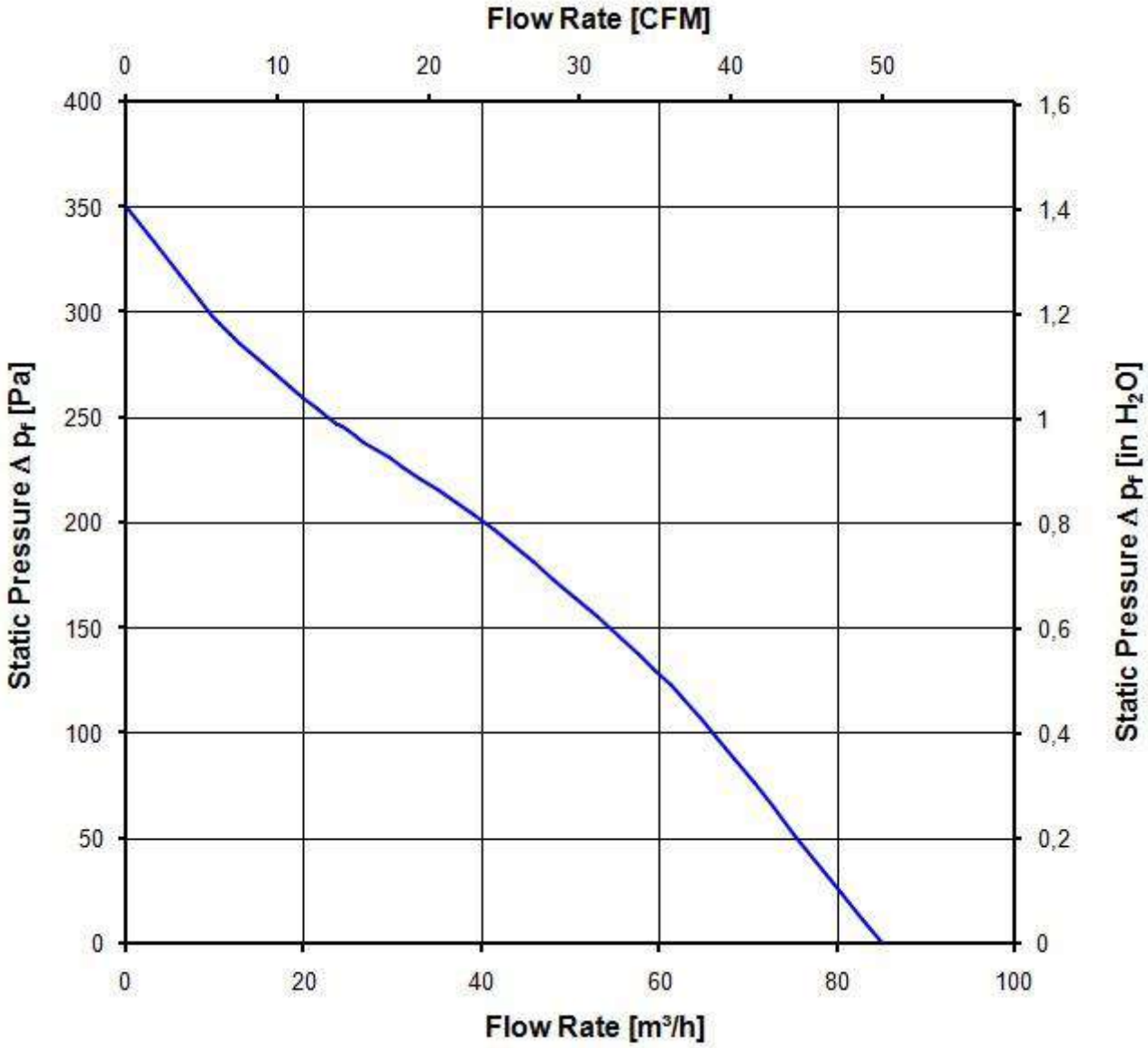
| | |
|---|---|
| Measurement conditions: | Measured with a double chamber intake rig acc. to DIN EN ISO 5801.<br>Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C;<br>In the intake and outlet area should not be any solid obstruction within 0,5 m.<br>The information is only valid under the specified 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: | 127 mm x 127 mm |
| Intake nozzle: | D: 70 mm; R: 3,5 mm |
| Distance between bottom and top plate: | 25 mm |
| Overlapping impeller / nozzle: | 2 mm |

a.) Operation condition:

| |
|---|
| 5.400 1/min at free air flow |

| | | |
|---|---|---|
| Max. free-air flow ($\Delta p$ = 0 / $\dot{V}$ = max.) | 86,0 m3/h | |
| Max. static pressure ($\Delta p$ = max. / $\dot{V}$ =0) | 350 Pa | |
| at free air flow | | |
| at free air flow | | |


Flow Rate [CFM]
0
10
20
30
40
50
400
350
300
250
200
150
100
50
0
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
Static Pressure Δ pf [Pa]
Static Pressure Δ pf [in H2O]
0
20
40
60
80
100
Flow Rate [m³/h]

### 3.4 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:

| |
|---|
| 5.400 1/min at free air flow |

| | | |
|---|---|---|
| Optimal operating point | 44,0 m3/h @ 164 Pa | |
| Sound power level at the optimal operating point | 6,3 bel(A) | |
| Sound pressure level at free air flow, measured in rubber bands | | |

## 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, 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

| **Kind** | **Radiated Emission; 30 MHz - 1000 MHz** |
|---|---|
| According | DIN EN 55022:2007-04 |
| Ceck accuracy / Limit | Class B |
| Result | Below limit Class B |

| **Kind** | **Electrostatic Discharge Immunity Test** |
|---|---|
| According | 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. |

## 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

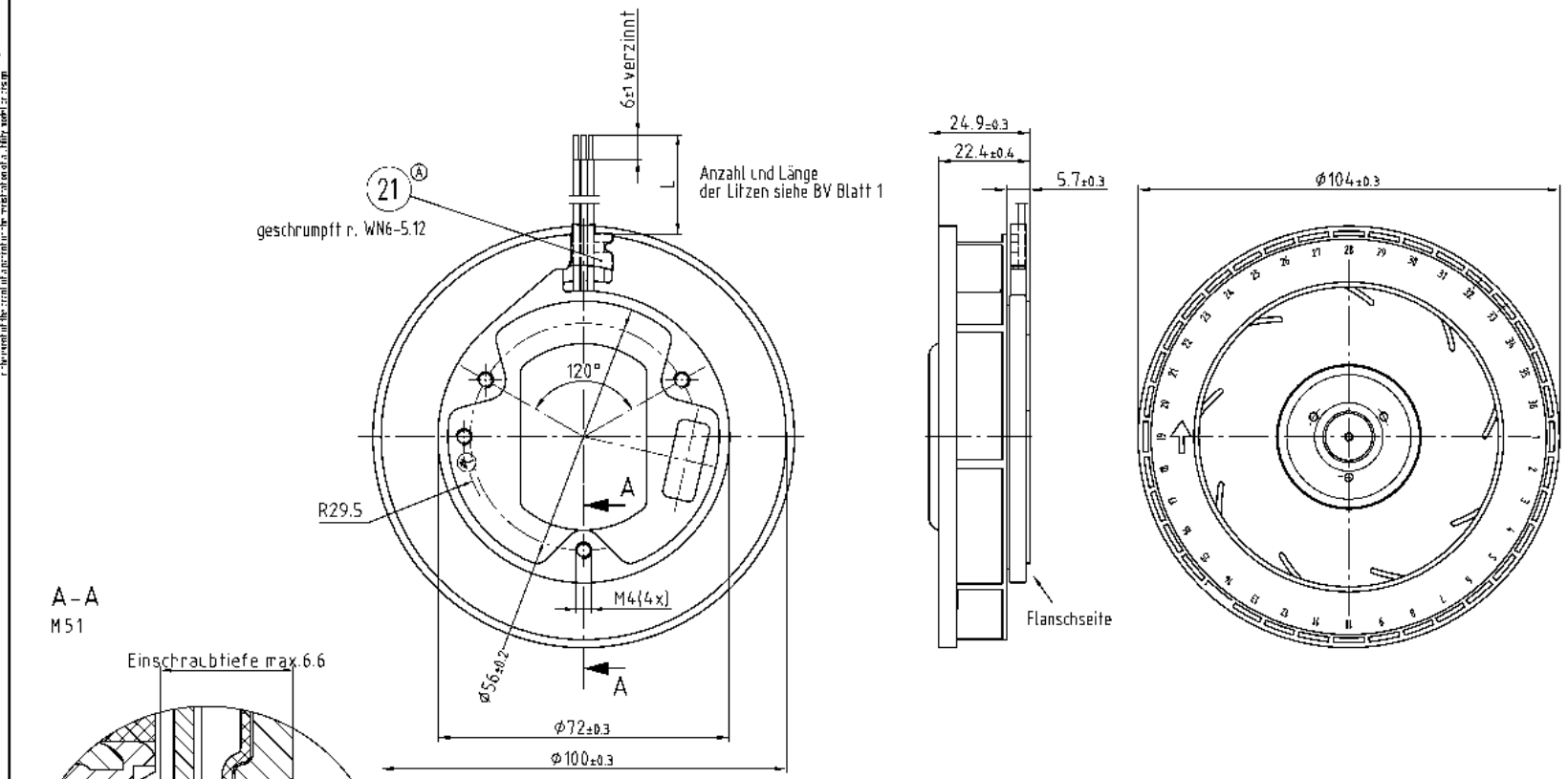
| | | |
|---|---|---|
| CE | EC Declaration of Conformity | Yes |
| EAC | Eurasian Conformity | Yes |
| UL | Underwriters Laboratories | Yes / UL507, Electric Fans |
| VDE | Association for Electrical, Electronic and Information Technologies | Yes / Approval acc. to EN 60950 (VDE 0805) - Information 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.:15,0 V @ TU approval max.: 75,0 °C

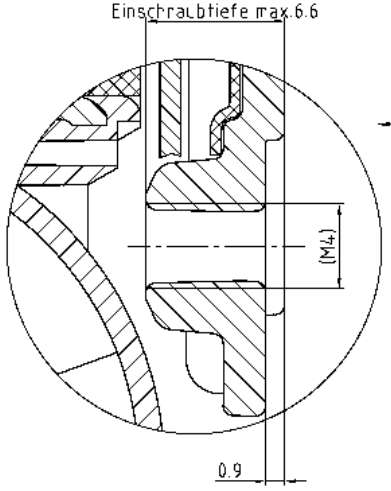
## 6 Reliability

### 6.1 General

| | | |
|---|---|---|
| Life expectancy L10 at TU = 40 °C | 80.000 h | |
| Life expectancy L10 at TU max. | 32.500 h | |
| Life expectancy L10 acc. to IPC 9591 at TU = 40 °C | 135.000 h | |




A-A
M5 1




Axialspiel bei
- Kugellagerung (K): 0 (mit Federausgleich)

| | | | |
|---|---|---|---|
| Tolerierung: DIN 7167<br>Allgemeintoleranzen: DIN ISO 2768-mK | | | |
| | Datum | Name | Artikel |
| Bearbeitet | | | |
| | Index | Änd.-Nr. | Zchg. Nr. |
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