

Product Data Sheet 5112 N/2

**ebm****papst**

The engineer's choice



5112 N/2

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## 1 General

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

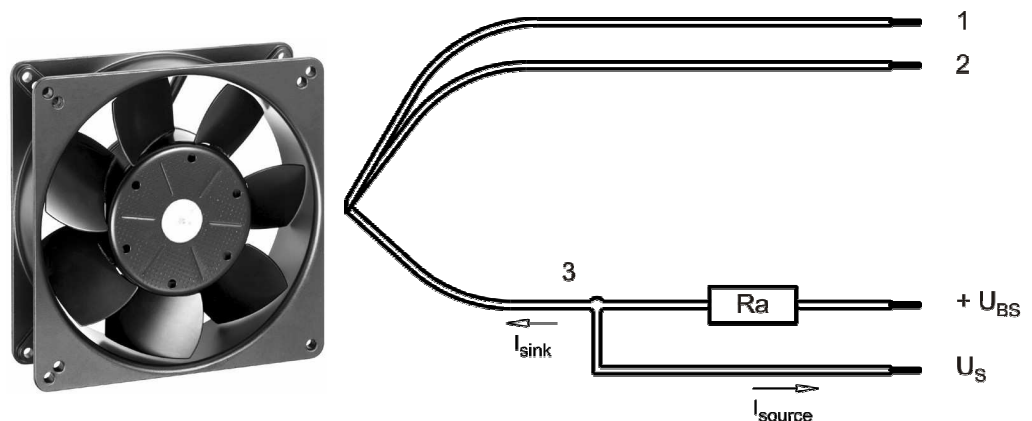
## 2 Mechanics

### 2.1 General

|                                                       |                                                                         |  |
|-------------------------------------------------------|-------------------------------------------------------------------------|--|
| Width                                                 | 135,0 mm                                                                |  |
| Height                                                | 135,0 mm                                                                |  |
| Depth                                                 | 38,0 mm                                                                 |  |
| Mass                                                  | 0,650 kg                                                                |  |
| Housing material                                      | Metal                                                                   |  |
| Impeller material                                     | Metal                                                                   |  |
| Max. torque when mounted across both mounting flanges | Wire outlet corner: 190 Ncm<br>Remaining corners: 240 Ncm               |  |
| Screw size                                            | ISO 4762 - M4 degreased, without an additional brace and without washer |  |

### 2.2 Connections

|                       |              |  |
|-----------------------|--------------|--|
| Electrical connection | Wires        |  |
| Lead wire length      | L = 310,0 mm |  |
| Tolerance             | + - 10,0 mm  |  |
| Tube length           | S = 15 mm    |  |
| Tolerance             | + - 5 mm     |  |



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

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

### 3 Operating Data

#### 3.1 Electrical Operating Data

Measurement conditions: Normal air density = 1,2 kg/m<sup>3</sup>; 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.

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

**Note:**

No inrush current at Unom means:

The internal electrolytic capacitor 470uF/35V 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              | 6,0 V       |             | 15 V        |
| Nominal voltage              |                | U <sub>N</sub> |             | 12 V        |             |
| Power consumption            | $\Delta p = 0$ | P              | 1,85 W      | 9,5 W       | 16,6 W      |
| Tolerance                    | 0010           |                | +/- 17,5 %  | +/- 12,5 %  | +/- 15 %    |
| Current consumption          | $\Delta p = 0$ | I              | 310 mA      | 790 mA      | 1.000 mA    |
| Tolerance                    | 0010           |                | +/- 17,5 %  | +/- 12,5 %  | +/- 15 %    |
| Speed                        | $\Delta p = 0$ | n              | 1.400 1/min | 2.900 1/min | 3.500 1/min |
| Tolerance                    | 0010           |                | +/- 12,5 %  | +/- 7,5 %   | +/- 10 %    |
| Starting current consumption |                |                |             | 1.300 mA    |             |

### 3.2 Electrical Interface - Output

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

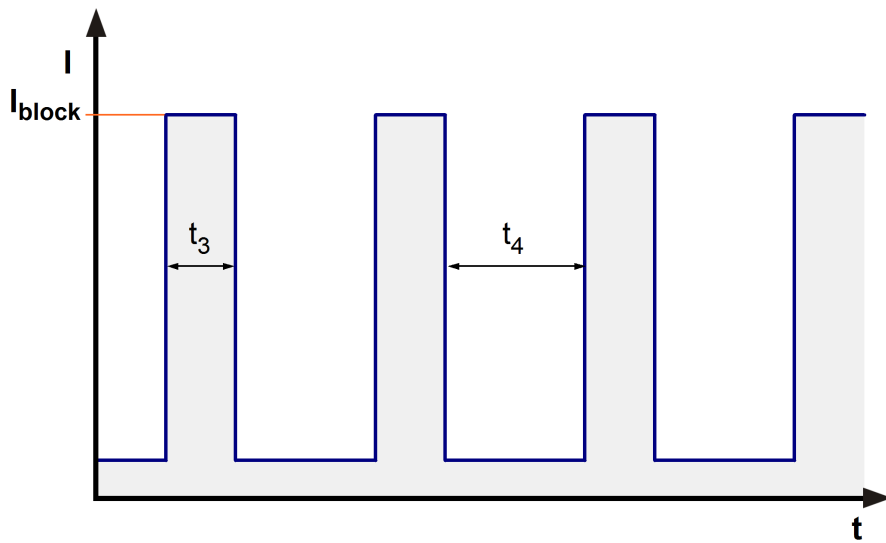


| Features                  | Note                                                                                   | Values                                                  |
|---------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|
| Tacho operating voltage   | $U_{BS}$                                                                               | Min.: 4,0 V    Max.: 15,0 V                             |
| Tacho signal Low          | $U_{S \text{ low}}$                                                                    | $I_{\text{sink}}: 2 \text{ mA}$<br>$\leq 0,4 \text{ V}$ |
| Tacho signal High         | $U_{S \text{ high}}$                                                                   | $I_{\text{source}}: 0 \text{ mA}$<br>15,0 V             |
| Maximum sink current      | $I_{\text{sink}}$                                                                      | $\leq 20 \text{ mA}$                                    |
| External resistor         | External resistor $R_a$ from $U_{BS}$ to $U_S$ required. All voltages measured to GND. |                                                         |
| Tacho frequency           | $(2 \times n) / 60$                                                                    |                                                         |
| Tacho isolated from motor | No                                                                                     |                                                         |
| Slew rate                 |                                                                                        | $\Rightarrow 0,5 \text{ V/us}$                          |

$n$  = revolutions per minute (1/min)

### 3.3 Electrical Features

|                                |                                     |  |
|--------------------------------|-------------------------------------|--|
| Electronic function            | None                                |  |
| Reversed polarity protection   | Rectifying diode                    |  |
| Max. residual current at $U_N$ | $I_F \leq 10 \text{ mA}$            |  |
| Locked rotor protection        | Auto restart                        |  |
| Locked rotor current at $U_N$  | $I_{\text{block}}$ approx. 1.100 mA |  |
| Clock signal at locked rotor   | $t_3 / t_4$ typical: 0,5 s / 5,0 s  |  |

**Internal Fuse:**

Littlefuse NANO2(R) FUSE; Slow-Blow 452 Series; 4 A (Art.-Nr.: 0452004.MRL)

Max. current when decelerate at Unom. aprox 1.800 mA peak.

### 3.4 Aerodynamics

Measurement conditions:

Measured with a double chamber intake rig acc. to DIN EN ISO 5801.

Normal air density = 1,2 kg/m<sup>3</sup>; Temperature 23°C +/- 3°C;

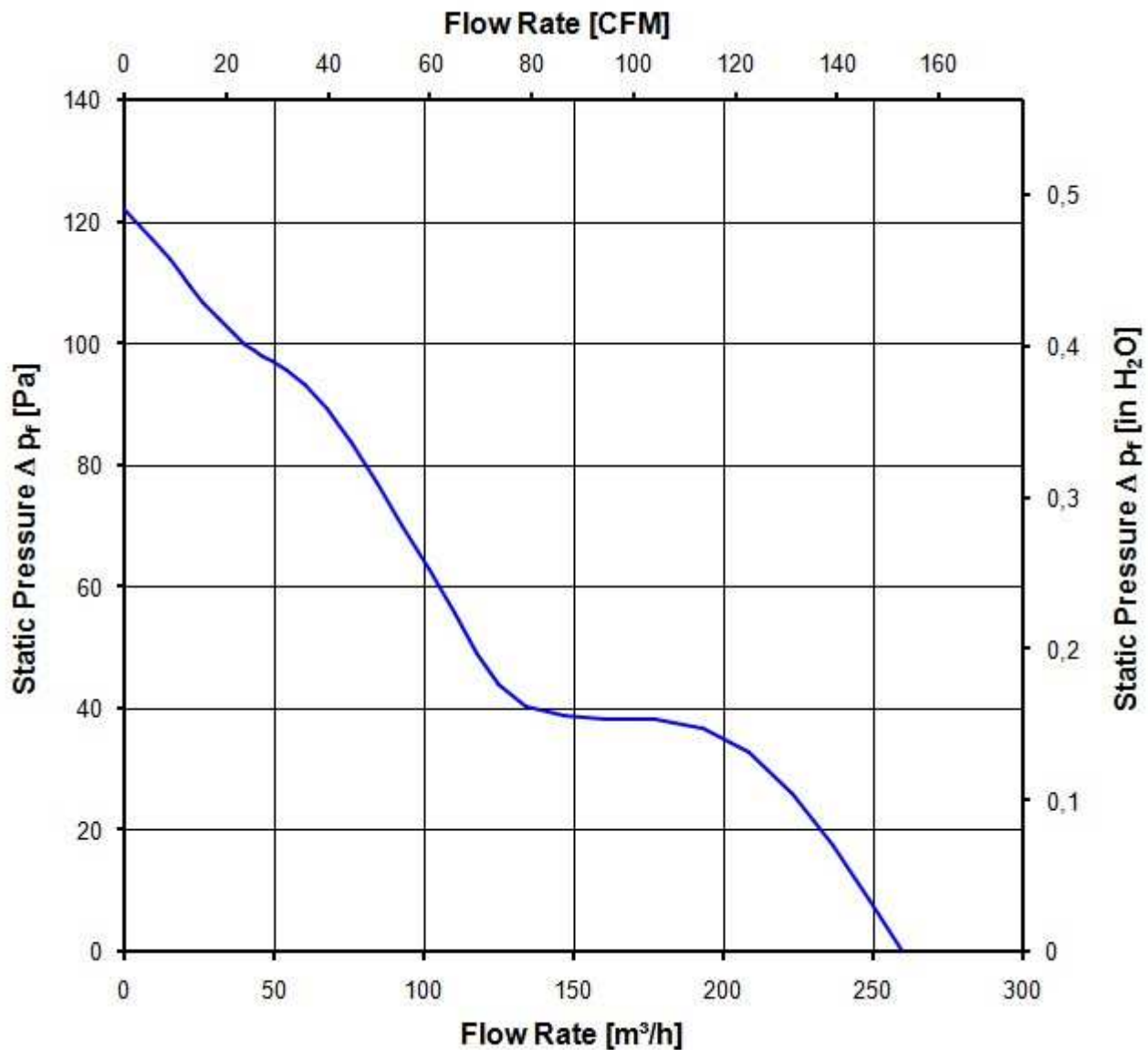
In the intake and outlet area should not be any solid obstruction within 0,5 m. Motor shaft horizontal.

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:

2.900 1/min at free air flow

|                                                           |                         |  |
|-----------------------------------------------------------|-------------------------|--|
| Max. free-air flow ( $\Delta p = 0 / \dot{V} = \max.$ )   | 260,0 m <sup>3</sup> /h |  |
| Max. static pressure ( $\Delta p = \max. / \dot{V} = 0$ ) | 122 Pa                  |  |



### 3.5 Sound Data

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

a.) Operation condition:

|                                                                 |                                 |  |
|-----------------------------------------------------------------|---------------------------------|--|
| 2.900 1/min at free air flow                                    |                                 |  |
| Optimal operating point                                         | 200,0 m <sup>3</sup> /h @ 35 Pa |  |
| Sound power level at the optimal operating point                | 6,1 bel(A)                      |  |
| Sound pressure level at free air flow, measured in rubber bands | 48,0 dB(A)                      |  |

## 4 Environment

### 4.1 General

|                                            |        |  |
|--------------------------------------------|--------|--|
| Min. permitted ambient temperature TU min. | -25 °C |  |
| Max. permitted ambient temperature TU max. | 72 °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>850 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 / 1,2 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                                                                |

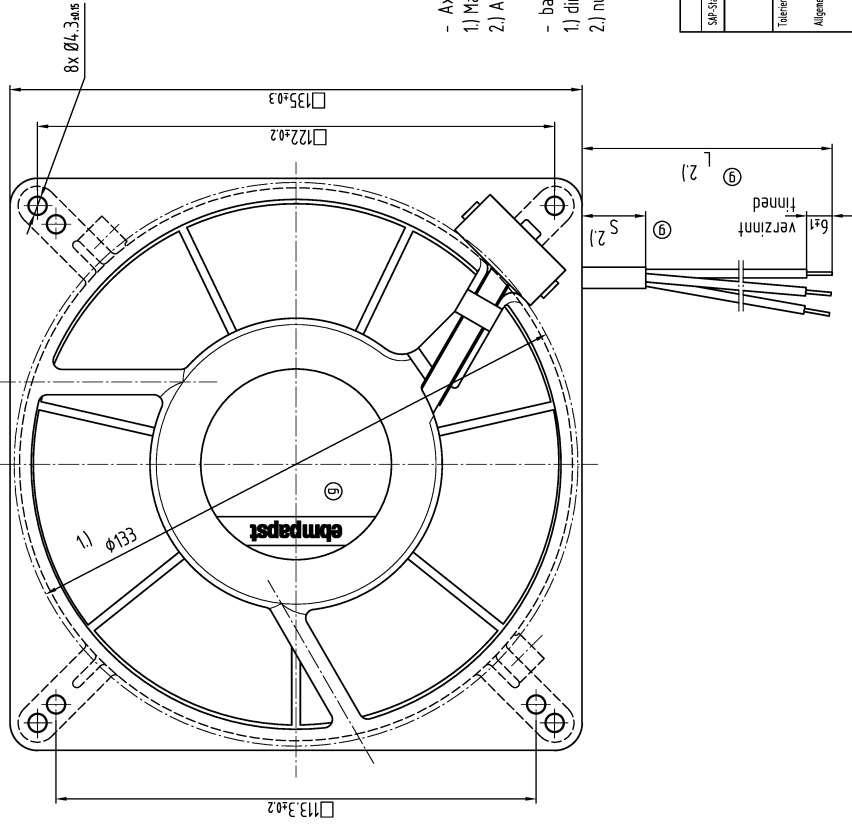
## 6 Reliability

### 6.1 General

|                                                    |           |  |
|----------------------------------------------------|-----------|--|
| Life expectancy L10 at TU = 40 °C                  | 80.000 h  |  |
| Life expectancy L10 at TU max.                     | 37.500 h  |  |
| Life expectancy L10 acc. to IPC 9591 at TU = 40 °C | 135.000 h |  |

Technical drawing of the front view of a metal frame. The drawing shows a rectangular frame with a central horizontal bar. The top horizontal bar has a width dimension of  $50,8\epsilon$ . The central horizontal bar has a width dimension of  $9$ . The bottom horizontal bar has a width dimension of  $9$ . The vertical bars have a height dimension of  $9$ . The drawing includes a detail view of the top horizontal bar, showing a cross-section with a central hole and a double-headed arrow indicating movement. A dimension line indicates a distance of  $9$  from the center of the hole to the edge of the bar. A dimension line indicates a distance of  $9$  from the center of the hole to the edge of the bar.

screw: Duo-TapTite DIN 7500, CM 4x8, Torx  
only if contained in sub-bill of material



- Axialspiel der Kugellager mit Feder spielfrei verspannt
- 1) Maße für Montageausschnitt
- 2) Anzahl und Länge der Litzen sowie Länge des Schlauchs siehe Produktspezifikation
- ball bearings without axial clearance by a pre-load spring
- 1) dimensions for mounting cut-out
- 2) number and length of wires and length of tube see product specification

|                 |                     |                        |                           |                     |
|-----------------|---------------------|------------------------|---------------------------|---------------------|
| SAP-Status/Size | Art.-Nr./Change-No. | Werkstoff/Material:    | ebmapst                   | Volume/Volume (mm³) |
|                 |                     | AutoCAD-System-Version | Unimapping/Unimapping     |                     |
|                 |                     | Dateiname              | Namen/Name                | Gewicht/Mass (g)    |
|                 |                     | Besch./<br>Brenn       | Artikel/Title             |                     |
|                 |                     | Gepr./<br>Unfired      |                           |                     |
|                 |                     | Einzel-/<br>Batch      |                           |                     |
|                 |                     |                        | Zug-Nr./Drawing-No.:      |                     |
|                 |                     |                        | <b>ebmapst</b>            |                     |
|                 |                     |                        | Dokument/Type of Document | Formal/Size         |
|                 |                     |                        | Freigegeben/Blatt/Fragel  | Inter/Inter         |
|                 |                     |                        |                           | G                   |
|                 |                     |                        |                           | Month/Scale         |