

Product Data Sheet RL48-19/12/2P

ebmpapst

The engineer's choice



RL48-19/12/2P

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1 General

| | | |
|-------------------------------------|----------------------------------|--|
| Fan type | Blower | |
| Rotating direction looking at rotor | Counterclockwise | |
| Airflow direction | Air in axially, Air out radially | |
| Bearing system | Ball bearing | |
| Mounting position - shaft | Any | |

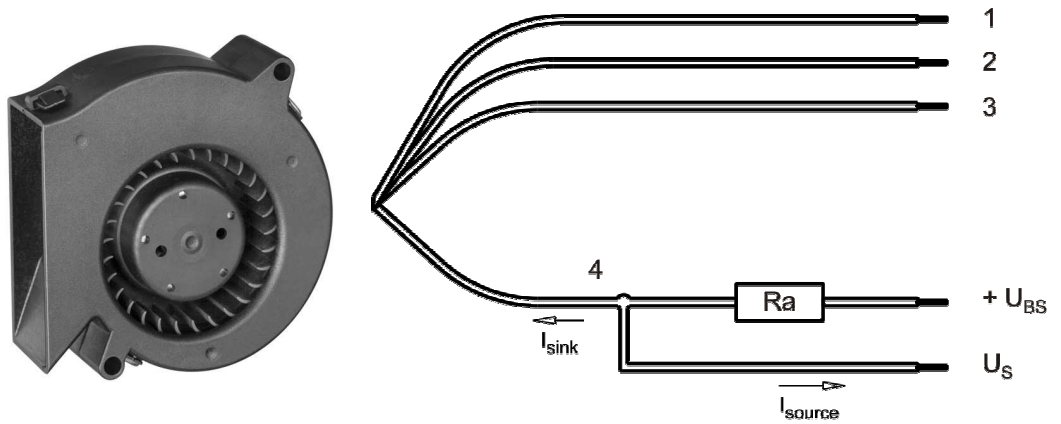
2 Mechanics

2.1 General

| | | |
|---|---|--|
| Width | 76,0 mm | |
| Height | 76,0 mm | |
| Depth | 27,0 mm | |
| Mass | 0,075 kg | |
| Housing material | Plastic | |
| Impeller material | Plastic | |
| Max. torque when mounted across both mounting flanges | Wire outlet corner: 120 Ncm Remaining corners: 120 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 mm | |
| Tolerance | +/- 10,0 mm | |



| Wire | Color | Operation | Wire size | Insulation diameter |
|------|--------|-----------|-----------|---------------------|
| 1 | red | + UB | AWG 26 | 1,35 mm |
| 2 | blue | - GND | AWG 26 | 1,35 mm |
| 3 | violet | PWM | AWG 26 | 1,35 mm |
| 4 | white | Tacho | AWG 26 | 1,35 mm |

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

3 Operating Data

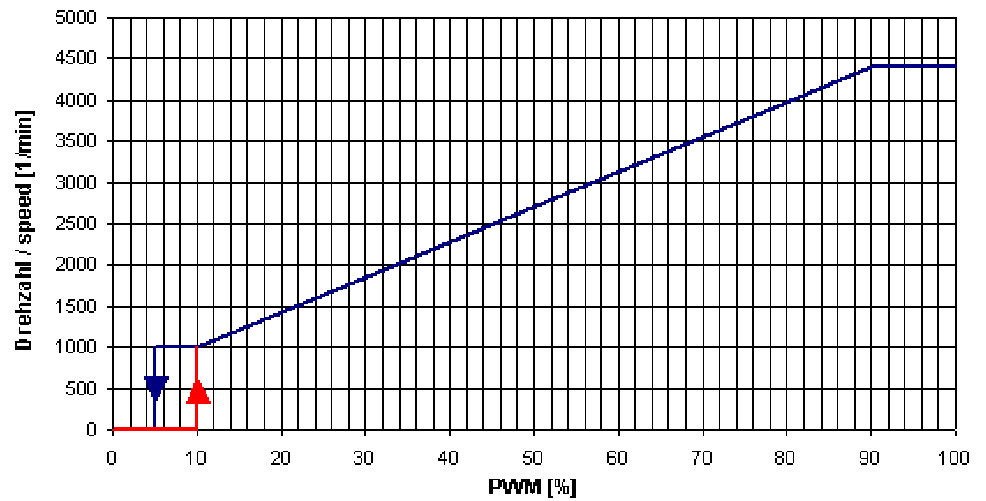
3.1 Electrical Interface - Input

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

Features

| | | |
|-----------------|----------------|---------------|
| Input type | Open collector | |
| PWM - Frequency | | 2 kHz - 5 kHz |

Characteristics



Lüfter / Fan

Kunde / Customer

Schematics

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.

$\Delta p = 0$: corresp. to free air flow (see chapter aerodynamics)

I: corresp. to arithm. mean current value

| Name | Condition |
|----------|------------------------|
| PWM 0001 | PWM: >= 90 %; f: 2 kHz |

| Features | Condition | Symbol | Values | | |
|------------------------------|----------------|--------|-------------|-------------|-------------|
| Voltage range | | U | 8,0 V | | 15,0 V |
| Nominal voltage | | U_N | | 12,0 V | |
| Power consumption | $\Delta p = 0$ | | 2,4 W | 5,6 W | 6,9 W |
| Tolerance | PWM 0010 | P | +/- 17,5 % | +/- 25,0 % | +/- 25,0 % |
| Current consumption | $\Delta p = 0$ | | 300 mA | 465 mA | 460 mA |
| Tolerance | PWM 0010 | I | +/- 17,5 % | +/- 25,0 % | +/- 25,0 % |
| Speed | $\Delta p = 0$ | | 3.370 1/min | 4.400 1/min | 4.400 1/min |
| Tolerance | PWM 0010 | n | +/- 15,0 % | +/- 3,0 % | +/- 3,0 % |
| Starting current consumption | | | | 1.100 mA | |

3.3 Electrical Interface - Output

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

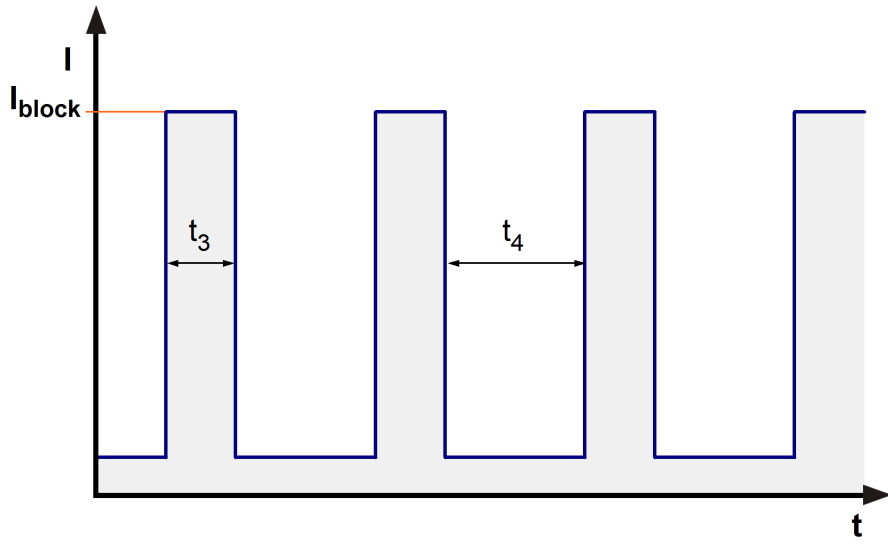


| Features | Note | Values |
|---------------------------|--|-------------------------------|
| Tacho operating voltage | U_{BS} | $\leq 60\text{ V}$ |
| Tacho signal Low | $U_{S\ low}$ | $\leq 0,4\text{ V}$ |
| Tacho signal High | $U_{S\ high}$ | $\leq 60\text{ V}$ |
| Maximum sink current | I_{sink} | $\leq 4\text{ mA}$ |
| External resistor | External resistor R_a from U_{BS} to U_S required. All voltages measured to GND. | |
| Tacho frequency | $(2 \times n) / 60$ | 147 Hz |
| Tacho isolated from motor | No | |
| Slew rate | | $\Rightarrow 0,5\text{ V/us}$ |

n = revolutions per minute (1/min)

3.4 Electrical Features

| | | |
|--------------------------------|-----------------------------------|--|
| Electronic function | Speed-Controlled | |
| 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_{block} approx. 1.100 mA | |
| Clock signal at locked rotor | t_3 / t_4 typical: 0,4 s / 10 s | |



3.5 Aerodynamics

Measurement conditions:

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

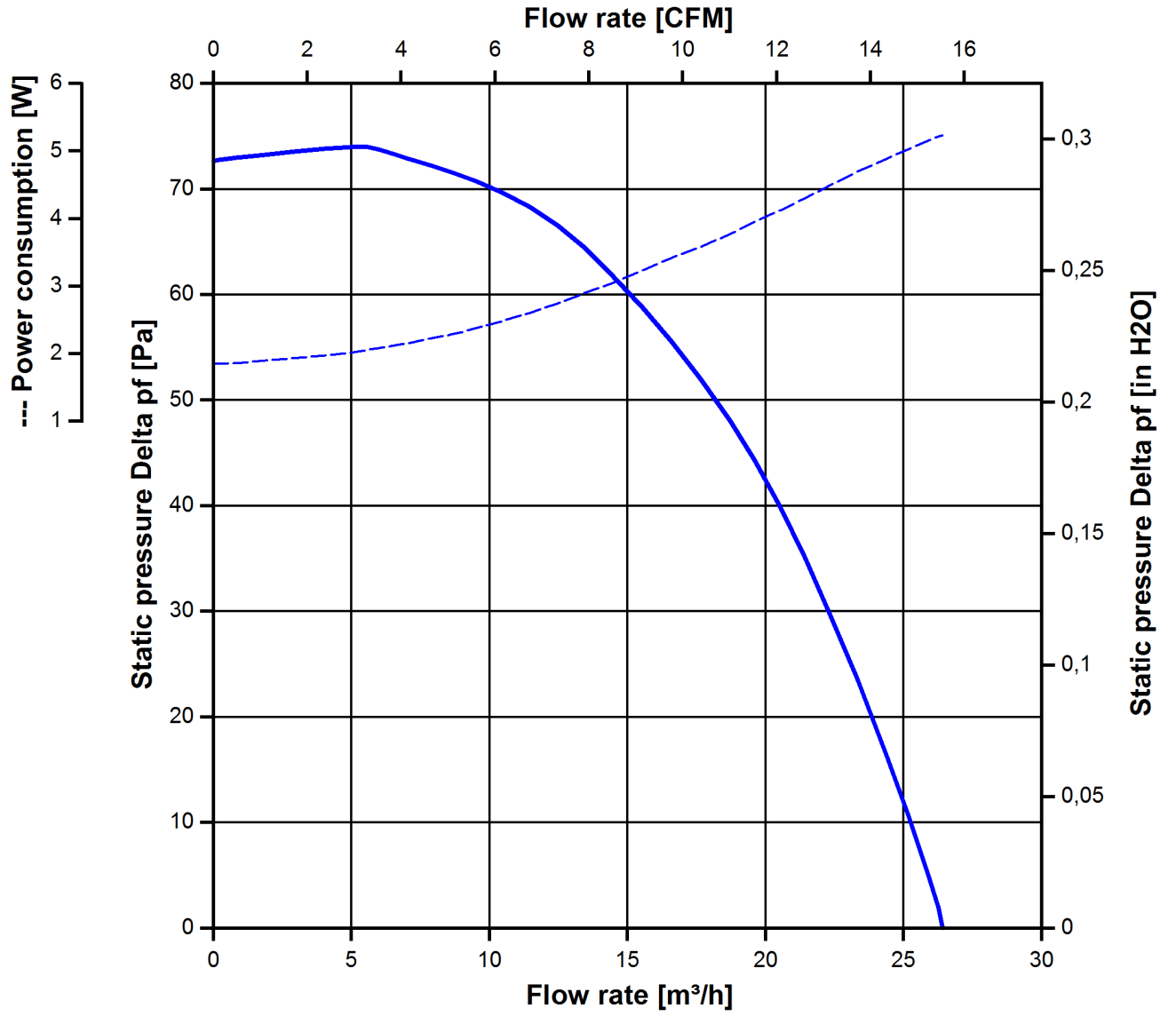
Normal air density = 1,2 kg/m³; Temperature 23°C +/- 3°C;

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. Power consumption of the fan motor when operating at normal voltage is shown. Depending on the operating conditions of the application, the power input may be higher.

a.) Operation condition:

| | | | |
|---|-----------------------|----------------------|--|
| 4.400 1/min at free air flow | PWM >= 90 %; f: 2 kHz | | |
| Max. free-air flow ($\Delta p = 0 / \dot{V} = \text{max.}$) | | 26 m ³ /h | |
| Max. static pressure ($\Delta p = \text{max.} / \dot{V} = 0$) | | 72 Pa | |



3.6 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:

| | | | |
|------------------------------|-----------------------------|--|--|
| 4.400 1/min at free air flow | PWM $\geq 90 \%$; f: 2 kHz | | |
|------------------------------|-----------------------------|--|--|

| | | | |
|---|-----------------------------|--|--|
| Optimal operating point | 5 m ³ /h @ 73 Pa | | |
| Sound power level at the optimal operating point | 5,2 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. | 70 °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 DIN EN 60950 (VDE 0805) and DIN EN 60335 (VDE 0700) A.) Type test Measuring conditions: After 48h of storage at 95% R.H. and 25°C. No arcing or breakdown is allowed! All connections together to ground. B.) Routine test Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All connections together to ground. | 500 VAC / 1 Min. 850 VDC / 1 Sec. | |
| Isolation resistance 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 | No |
| VDE | Association for Electrical, Electronic and Information Technologies | No |
| CSA | Canadian Standards Association | No |
| CCC | China Compulsory Certification | Not applicable |

6 Reliability

6.1 General

| | | |
|--|-----------|--|
| Life expectancy L10 at TU = 40 °C | 60.000 h | |
| Life expectancy L10 at TU max. | 30.000 h | |
| Life expectancy L10 acc. to IPC 9591 at TU = 40 °C | 102.500 h | |



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