Automotive
BL-DC Fans for Commercial Vehicles
Edition 2016-08
Our automotive products BL-DC axial fans and BL-DC dual centrifugal fans with housing are ground breakers in the field of commercial vehicle air conditioning.

They not only meet the increased demands for comfort, e.g. in buses but also work wear-free for over 40,000 operating hours as they are brushless.

No additional maintenance, no additional servicing.

This corresponds to the usual reliability expected from ebm-papst.

Data is subject to change without notice at ebm-papst discretion.

Benefits and characteristics at a glance
- over 40,000 operating hours
- variable speed control
- high efficiency
- low sound emission thanks to aerodynamically optimized impellers
- increased reliability due to the electronics' high integration density
- can be retrofitted into existing systems
- compliance with the most stringent EMC requirements
- configurable control curve
- optimized voltage independence
- extended temperature range
- long-life ball bearings

EC dual centrifugal blower: for top performance in minimal installation space; easy to regulate and extremely quiet.
Our automotive products .....
About ebm-papst
Ideas for changing technology in commercial vehicles
EC dual centrifugal fan with housing “Premium”
EC dual centrifugal fan with housing “Basic”
EC axial fans “Premium & Power”
EC axial fans “Basic”

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ebm-papst agents 90
As a leader in technologies for ventilation and drive engineering, ebm-papst is in demand as an engineering partner in many sectors. With over 15,000 different products, we provide the right solution for just about any challenge. Our fans and drives are reliable, quiet and energy-efficient.

Six reasons that make us the ideal partner:

Our systems expertise.
You want the best solution for every project. The interrelationships between ventilation and drive engineering must thus be considered as a whole. And that’s what we do – with motor technology that sets standards, sophisticated electronics and aerodynamic designs – all from a single source and perfectly matched. These system solutions release unique synergies worldwide. And in particular – they relieve you of a lot of work, so that you can concentrate on your core competency.

The ebm-papst spirit of invention.
In addition to our wide range of products, we are always able to develop customized solutions for you. A diversified team of 600 engineers and technicians works at our three locations in Germany: Mulfingen, Landshut and St. Georgen. Contact us to discuss your next project.

Our lead in technology.
As pioneer and trail-blazer for developing highly efficient EC technology, we are way ahead of other motor manufacturers. Almost our entire product range is also available with GreenTech EC technology. The list of benefits is long: higher efficiency, maintenance-free, longer service life, sound reduction, intelligent control characteristics and incomparable energy efficiency with savings of up to 80% compared to conventional AC technology. Let our technology be your competitive advantage as you lead in your industry.

Proximity to our customers.
ebm-papst owns 57 sales offices worldwide, of which 47 are subsidiaries with an extensive network of sales representatives and distributors. You will always have a local contact, someone who speaks your language and knows your market.

Our standard of quality.
Of course you can rely on the highest standards of quality with our products. Our quality management is uncompromising, at every step in every process. This is underscored by our certification according to international standards including DIN EN ISO 9001, ISO/TS 16949-2 and DIN EN ISO 14001.

Our sustainable approach.
Assuming responsibility for the environment, for our employees and for society is an integral part of our corporate philosophy. We develop products with an eye to maximum environmental compatibility, in particular resource-preserving production methods. We promote environmental awareness among our young staff and are actively involved in sporting, cultural activities and education. That’s what makes us a leading company – and an ideal partner for you.
The story of our success to market and technology pioneer.

1963  Founding of Elektrobau Mulfingen GmbH & Co. KG by Gerhard Sturm and Heinz Ziehl.
1965  First tubaxial fan developed in EC/DC technology.
1966  Ebm-papst’s success takes off with the new 68 motor.
1972  The first ebm-papst foreign subsidiary is established in Sweden.
1988  Gerhard Sturm is awarded the Federal Cross of Merit.
1990  The sixty-millionth external-rotor fan is produced.
1992  Acquisition of PAPST Motoren GmbH in St. Georgen.
1997  Buyout of the Landshut (mvl) plant.
1998  Development of first fans with integrated electronics.
2003  Change of name to ebm-papst.
2008  The HyBlade® range of fans sets new efficiency standards.
2010  GreenTech — our sign for energy efficiency and resource preservation.
2011  RadiCal defines a new standard for EC centrifugal fans.
2013  Ebm-papst takes over the gearbox specialist Zeitlauf and wins the German Sustainability Award.
2014  Team partnership with Mercedes AMG PETRONAS Formula 1 team.
2015  RadiPac pushes the limits of efficiency.
Ideas for changing technology in commercial vehicles

Climate comfort in a commercial vehicle is anything but a question of convenience. Both the transportation of people in buses and coaches, as well truck journeys which are as stress and fatigue-free as possible, place high demands on vehicle technology; predominantly air conditioning, ventilation, and heating.

For many years, major bus manufacturers have been installing air conditioners with brushless and wear-free centrifugal blowers and axial fans from ebm-papst. In the mean time, these products are also now widely used in the air conditioning and ventilation systems for the cabs in trucks, tractors and construction machinery, as well as in transport refrigeration systems.

A number of air conditioning manufacturers rely on our experience and outstanding expertise in the core competencies of engine development, aerodynamics, and electronics.

Counteracting high demands with new technologies:
In modern commercial vehicles, EC technology has now become standard. Our new EC axial fans and EC dual centrifugal fans with second generation housing set a precedent in global commercial vehicle air conditioning. Our EC fans have even been able to demonstrate their clear superiority in hot countries and tropical regions, where they have also proven their worth.

But it is not just in the field of air conditioning products where customers are relying on ebm-papst products: EC fans are increasingly being used for cooling heat exchangers in the engine compartment of vehicles.

Fans and blowers: for commercial vehicle air conditioning and cooling of individual components.

However, ebm-papst has even more to offer:
If you are unable to find a solution amongst our products, speak to us. As a competent consultant and practical implementer, we will certainly be able to find you a solution thanks to our in-depth knowledge from many applications.
In comparison:
In brush motors from various manufacturers, the commutator assumes the role of current distribution to the coils. The commutator consists of copper fins embedded in an insulating compound. Mechanical springs push the integrated carbon brushes to the commutator. These two rubbing mechanical components are the weak spot of conventional DC motors. After around 5,000 operating hours, the carbon brushes are run down and the commutator is worn. As a result, the entire blower must be replaced. In addition, it is only possible to regulate speed via external electronics.

The brushless DC motors from ebm-papst are completely different. Here, an electronic controller directly integrated in the motor has the task of distributing current. No brushes means no wearing parts. This increases the service life of these motors to more than 40,000 hours. The user not only saves money in terms of replacement parts and repair costs, he also avoids unproductive downtimes and a possible loss of image.

EC motors are energy efficient, because the integrated electronics with variable speed control only draw the energy actually required from the on-board network. In the commercial vehicle sector, it is also crucial that fans withstand constantly changing environmental influences. Standard products would only provide unsatisfactory results here. For this reason, automotive products from ebm-papst are also reliably protected against load dumping, reverse polarity, shock and vibration, as well as damage from moisture and dirt penetration across a wide temperature range.

This also requires special efforts in terms of the selection of materials and testing of products. With the help of real-world extreme tests that we have defined in collaboration with leading OEMs (e.g., salt spray, vibration and temperature cycling tests), we are able to ensure the performance of the fans.

Apart from the considerably longer service life, our intelligent EC fans provide advanced control and regulation possibilities. The functionality of the fans can be checked via a diagnostic output at any time. Furthermore, these display excellent electromagnetic compatibility traits and operate extremely quietly.
EC dual centrifugal fans with housing

with brushless DC motor "Premium"
EC dual centrifugal fan
with housing, for automotive applications, Ø 097

- Material: Housing: PP plastic, black (according to UL 94 HB)
  Blades: PA plastic (according to UL 94 HB)
- Degree of protection: IP 24 KM
- Insulation class: "B" according to EN 60335-1
- Installation position: Any
- Mode: Continuous operation (S1)
- Mounting: Maintenance-free ball bearings on both sides
- Motor protection: Thermal overload protection, reverse polarity and locked-rotor protection,
  load dump protection, undervoltage detection
- EMC regulations: VDE 0879-2
- Approvals: EAC; E1 in preparation

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>VDC</th>
<th>VDC</th>
<th>m³/h</th>
<th>rpm</th>
<th>W</th>
<th>A</th>
<th>Pa</th>
<th>dB(A)</th>
<th>°C</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>K3G 097-AP22 -02(1)</td>
<td>M3G 084-BF</td>
<td>26</td>
<td>16-32</td>
<td>1150</td>
<td>3500</td>
<td>325</td>
<td>12,5</td>
<td>0</td>
<td>81</td>
<td>-40...+85(2)</td>
<td>2,0</td>
</tr>
</tbody>
</table>

Subject to change (1) 24-volt version         (2) above +70 °C with power derating

### Curves:

Air performance measured according to ISO 5801, installation category A, in ebm-papst scroll housing without contact protection.
Intake-side sound level: Lw A according to ISO 13347, Lp A measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.

<table>
<thead>
<tr>
<th>n rpm</th>
<th>P ped W</th>
<th>I A</th>
<th>LwA dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3500</td>
<td>325</td>
<td>12,50</td>
<td>81</td>
</tr>
<tr>
<td>4025</td>
<td>293</td>
<td>11,25</td>
<td>79</td>
</tr>
<tr>
<td>4495</td>
<td>272</td>
<td>10,45</td>
<td>78</td>
</tr>
<tr>
<td>4930</td>
<td>259</td>
<td>9,59</td>
<td>80</td>
</tr>
</tbody>
</table>
Connector detail

1 = UN
2 = GND
3 = PWM/LIN
4 = INVLIN
5 = ABSENK
6 = diagnostic output

Tyco Junior Power Timer 926045-2, 6-pole, coded.
Mating connector Tyco 926044-2 (not included in scope of delivery).
Cable 960 mm with mating connector, part no. (not included in scope of delivery).

EC centrifugal fans
- RadiCal
- backward-curved

EC centrifugal fans
- forward-curved

EC axial fans
- "Basic"
- "Premium & Power"

EC dual centrifugal fans
- with housing "Basic"
- with housing "Premium"
EC dual centrifugal fan
with housing, for automotive applications, Ø 097

- **Material**: Housing: PP plastic, black (according to UL 94 HB)
  Blades: PA plastic (according to UL 94 HB)
- **Degree of protection**: Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class**: “B” according to EN 60335-1
- **Installation position**: Any
- **Mode**: Continuous operation (S1)
- **Mounting**: Maintenance-free ball bearings on both sides
- **Motor protection**: Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- **EMC regulations**: VDE 0879-2
- **Qualified in accordance with**: DIN ISO 16750
- **Approvals**: EAC; E1 in preparation

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Nominal voltage</th>
<th>Nominal voltage range</th>
<th>Air flow</th>
<th>rpm</th>
<th>Input power</th>
<th>Input current</th>
<th>Min. back pressure</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>Tech. features and connection diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>K3G 097-AF22 -07(1)</td>
<td>M3G 084-BF</td>
<td></td>
<td>VDC</td>
<td>26</td>
<td>16-32</td>
<td>1150</td>
<td>3500</td>
<td>325</td>
<td>12,5</td>
<td>81</td>
<td>-40..+85(2)</td>
<td>2,0</td>
<td>P. 79 / D)</td>
</tr>
</tbody>
</table>

Subject to change

(1) 24-volt version

(2) above +70 °C with power derating

This Type is also available with a sealed plug.

### Curves:

Air performance measured according to ISO 5801, installation category A, in ebm-papst scroll housing without contact protection. Intake-side sound level, L_{PA} measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Cable with plug (plug is not sealed by the customer)

1 = +UB       black
2 = GND      brown
3 = PWM/LIN   yellow
4 = INVLIN    orange
5 = ABSENK    blue
6 = diagnostic output      white

Tyco Junior Power Timer 929505-2, 6-pole, coded.
Mating connector Tyco 929504-2 (not included in scope of delivery).

EC centrifugal fans - RadiCal
EC centrifugal fans forward-curved
EC axial fans "Basic"
EC axial fans "Premium & Power"
EC dual centrifugal fans with housing "Basic"
EC dual centrifugal fans with housing "Premium"
EC dual centrifugal fan
with housing, for automotive applications, Ø 097

- Material: Housing: PP plastic, black (according to UL 94 HB)
  Blades: PA plastic (according to UL 94 HB)
- Degree of protection: IP 24 KM
- Insulation class: "B" according to EN 60335-1
- Installation position: Any
- Mode: Continuous operation (S1)
- Mounting: Maintenance-free ball bearings on both sides
- Motor protection: Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- EMC regulations: VDE 0879-2
- Approvals: EAC; E1 in preparation

<table>
<thead>
<tr>
<th>Nominal data</th>
<th>Curve</th>
<th>Nominal voltage range</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Min. back pressure</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>Tech. features and connection diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Motor</td>
<td>VDC</td>
<td>VDC m³/h</td>
<td>rpm</td>
<td>W</td>
<td>A</td>
<td>Pa</td>
<td>dB(A)</td>
<td>°C</td>
<td>kg</td>
<td></td>
</tr>
<tr>
<td>K3G 097-BF22 -02</td>
<td>M3G 084-BF</td>
<td>26</td>
<td>16-32</td>
<td>1040</td>
<td>300</td>
<td>11.7</td>
<td>0</td>
<td>80</td>
<td>-40...+85(2)</td>
<td>2.0</td>
<td>P. 79 / D)</td>
</tr>
</tbody>
</table>

Subject to change
(1) 24-volt version
(2) above +70 °C with power derating

Air performance measured according to: ISO 5801, installation category A, in ebm-papst scroll housing without contact protection. Intake-side sound level $L_p$A according to ISO 13347, $L_w$A, measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Connector detail
1 = UN
2 = GND
3 = PWM/LIN
4 = INV/LIN
5 = ABSENK
6 = diagnostic output

Tyco Junior Power Timer 929505-2, 6-pole, coded.
Mating connector Tyco 929504-2 (not included in scope of delivery).
Cable (460 mm) with mating connector, part no. 02001-4-1021 (not included in scope of delivery).
EC dual centrifugal fan
with housing, for automotive applications, Ø 097

- **Material:** Housing: PA plastic, black (according to UL 94 V0)
  Blades: PA plastic, black (according to UL 94 V0)
- **Degree of protection:** Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class:** “B”
- **Installation position:** Any
- **Mode:** Continuous operation (S1)
- **Mounting:** Maintenance-free ball bearings on both sides
- **Motor protection:** Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- **EMC regulations:** VDE 0879-2
- **Approvals:** EAC; E1 in preparation

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Normal voltage range</th>
<th>Normal voltage</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Min. back pressure</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>Tech. features and connection diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>K3G 097-AS82-82(1)</td>
<td>M3G 084-BF</td>
<td>26</td>
<td>16-32</td>
<td>1574</td>
<td>4680</td>
<td>740</td>
<td>28,0</td>
<td>0</td>
<td>88</td>
<td>-40..+60</td>
<td>2,0</td>
<td>P 83 / 0j</td>
<td></td>
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</table>

Subject to change

(1) 24-volt version

### Curves:

Air performance measured according to ISO 5801, installation category A. In ebm-papst scroll housing without contact protection. Intake-side sound level, Lw A, according to ISO 13347. Lw A measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Cable: BETAtrans® 3 GKW 6 mm², 2x crimped ferrules (brown, black)
BETAtrans® 3 GKW 1 mm², 2x crimped ferrules (yellow, white)

Terminal assignment:
- + UB (black)
- GND (brown)
- PWM/LIN (yellow)
- Diagnostic output (white)

EC centrifugal fans - RadiCal

EC axial fans "Basic"

EC dual centrifugal fans with housing "Basic"

EC dual centrifugal fans with housing "Premium"

Information
**EC dual centrifugal fan**

with housing, for automotive applications, Ø 097

- **Material:** Housing: PP plastic, black (according to UL 94 HB)
  Blades: PA plastic (according to UL 94 HB)
- **Degree of protection:** IP 24 KM (without connectors)
- **Insulation class:** “B” according to EN 60335-1
- **Installation position:** Any
- **Mode:** Continuous operation (S1)
- **Mounting:** Maintenance-free ball bearings on both sides
- **Motor protection:** Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- **EMC regulations:** VDE 0879-2

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Nominal voltage range</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Min. back pressure</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>Connection diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>K3G 097-AK32</td>
<td>M3G 074-BF</td>
<td>(1) 13</td>
<td>9-15</td>
<td>750</td>
<td>3630</td>
<td>195</td>
<td>15.0</td>
<td>300</td>
<td>70</td>
<td>-40...+85</td>
<td>2.3</td>
<td>P. 74 / A</td>
</tr>
<tr>
<td>K3G 097-AK36</td>
<td>M3G 074-BF</td>
<td>(1) 13</td>
<td>9-15</td>
<td>1180</td>
<td>3740</td>
<td>385</td>
<td>29.5</td>
<td>0</td>
<td>76</td>
<td>-40...+85</td>
<td>2.6</td>
<td>P. 74 / A</td>
</tr>
</tbody>
</table>

Subject to change

(1) 12-volt version
(2) wide open, not recommended for continuous operation at 85°C

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Air performance measured according to ISO 5801, installation category A, in ebm-papst scroll housing without contact protection.
Intake-side sound power level, $L_{pA}$, according to ISO 13347, measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Connection diagram P. 74

Cable detail:
(K3G097-AK32-42)
UN black
PWM/LIN yellow
GND brown

Wire-end ferrule

Cable detail:
(K3G097-AK36-55)
UN black
PWM/LIN yellow
GND brown

Tin-plated
EC dual centrifugal fans with housing

with brushless DC motor "Basic"
**EC dual centrifugal fan**

with housing, for automotive applications, Ø 097

- **Material**: Housing: PP plastic, black (according to UL 94 HB)
  Blades: PA plastic (according to UL 94 HB)
- **Degree of protection**: IP 24 KM (without connectors)
- **Insulation class**: “B” according to EN 60335-1
- **Installation position**: Any
- **Mode**: Continuous operation (S1)
- **Mounting**: Maintenance-free ball bearings on both sides
- **Motor protection**: Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- **EMC regulations**: VDE 0879-2
- **Approvals**: EAC, E1

<table>
<thead>
<tr>
<th>Nominal data</th>
<th>Motor</th>
<th>VDC</th>
<th>VDC</th>
<th>m³/h</th>
<th>rpm</th>
<th>W</th>
<th>A</th>
<th>Pa</th>
<th>dB(A)</th>
<th>°C</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>K3G 097-AK34 -65(1)</td>
<td>M3G 074-CF</td>
<td>26</td>
<td>16-32</td>
<td>1290</td>
<td>3830</td>
<td>394</td>
<td>15,2</td>
<td>0</td>
<td>79</td>
<td>-40...+85(2)</td>
<td>2,0</td>
</tr>
</tbody>
</table>

Subject to change

(1) 24-volt version
(2) wide open, not recommended for continuous operation at 85°C

### Curves:

**Nominal voltage range**

- 100 %
- 80 %
- 60 %

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Air performance measured according to ISO 5801, installation category A, in ebm-papst scroll housing without contact protection. Intake-side sound level, LwA, according to ISO 3744, measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Connector detail:

1 = + UB
2 = GND
3 = PWM/LIN, 100% speed
4 = 80% speed
5 = 60% speed
6 = NC (not used)

Tyco Junior Power Timer 929505-2, 6-pole, coded.
Mating connector Tyco 929504-2 (not included in scope of delivery).
Cable (460 mm) with mating connector, part no. 02001-4-102 (not included in scope of delivery).

Speed setting:

<table>
<thead>
<tr>
<th>Speed Setting</th>
<th>Pin 6</th>
<th>Pin 5</th>
<th>Pin 4</th>
<th>Pin 3</th>
<th>Pin 2</th>
<th>Pin 1</th>
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</thead>
<tbody>
<tr>
<td>60%</td>
<td>NC</td>
<td>H</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
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</tr>
<tr>
<td>80%</td>
<td>NC</td>
<td>H</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
<td></td>
</tr>
<tr>
<td>100%</td>
<td>NC</td>
<td>NC</td>
<td>H</td>
<td>H</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EC centrifugal fans:

- RadiCal
- Backward-curved

EC axial fans:

- "Basic"
- "Premium & Power"

EC dual centrifugal fans:

- With housing "Basic"
- With housing "Premium"
EC dual centrifugal fan
with housing, for automotive applications, Ø 097

- **Material**: Housing: PP plastic, black (according to UL 94 HB)
  Blades: PA plastic (according to UL 94 HB)
- **Degree of protection**: IP 24 KM (without connectors)
- **Insulation class**: “B” according to EN 60335-1
- **Installation position**: Any
- **Mode**: Continuous operation (S1)
- **Mounting**: Maintenance-free ball bearings on both sides
- **Motor protection**: Thermal overload protection, reverse polarity and locked-rotor protection,
  load dump protection, undervoltage detection
- **EMC regulations**: VDE 0879-2
- **Approvals**: EAC, E1

**Nominal data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>VDC</th>
<th>VDC</th>
<th>m³/h</th>
<th>rpm</th>
<th>W</th>
<th>A</th>
<th>Pa</th>
<th>dB(A)</th>
<th>°C</th>
<th>kg</th>
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</thead>
<tbody>
<tr>
<td>K3G 097-BK34-65(1)</td>
<td>M3G 074-CF</td>
<td>26</td>
<td>16-32</td>
<td>1110</td>
<td>4040</td>
<td>344</td>
<td>13.3</td>
<td>0</td>
<td>77</td>
<td>-40..+85(1)</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Subject to change (1) 24-volt version (2) wide open, not recommended for continuous operation at 85°C

**Curves:**

- Material: Housing: PP plastic, black (according to UL 94 HB)
  Blades: PA plastic (according to UL 94 HB)
- Degree of protection: IP 24 KM (without connectors)
- Insulation class: “B” according to EN 60335-1
- Installation position: Any
- Mode: Continuous operation (S1)
- Mounting: Maintenance-free ball bearings on both sides
- Motor protection: Thermal overload protection, reverse polarity and locked-rotor protection,
  load dump protection, undervoltage detection
- EMC regulations: VDE 0879-2
- Approvals: EAC, E1

**Nominal data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>VDC</th>
<th>VDC</th>
<th>m³/h</th>
<th>rpm</th>
<th>W</th>
<th>A</th>
<th>Pa</th>
<th>dB(A)</th>
<th>°C</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>K3G 097-BK34-65(1)</td>
<td>M3G 074-CF</td>
<td>26</td>
<td>16-32</td>
<td>1110</td>
<td>4040</td>
<td>344</td>
<td>13.3</td>
<td>0</td>
<td>77</td>
<td>-40..+85(1)</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Subject to change (1) 24-volt version (2) wide open, not recommended for continuous operation at 85°C

**Curves:**

Air performance measured according to ISO 5801, installation category A, in ebm-papst scroll housing without contact protection.
Intake-side sound level: LwA according to ISO 13347, LpA measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Connector detail

1 = + UB
2 = GND
3 = PWM/LIN, 100% speed
4 = 80% speed
5 = 60% speed
6 = NC (not used)

Tyco Junior Power Timer 929505-2, 6-pole, coded.
Mating connector Tyco 929504-2 (not included in scope of delivery).
Cable (460 mm) with mating connector, part no. 02001-4-1021 (not included in scope of delivery).

Speed setting

<table>
<thead>
<tr>
<th>Pin</th>
<th>5</th>
<th>4</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>60%</td>
<td>H</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>80%</td>
<td>NC</td>
<td>H</td>
<td>NC</td>
</tr>
<tr>
<td>100%</td>
<td>NC</td>
<td>NC</td>
<td>H</td>
</tr>
</tbody>
</table>

NC = not used
H = UN (26 V)
EC axial fans
with brushless DC motor  "Premium & Power"
EC axial fan
for automotive applications, Ø 250

- Material: Housing: PA plastic, black (according to UL 94 HB)
  Blades: PP plastic, black (according to UL 94 HB)
- Airflow direction: "V"
- Direction of rotation: Clockwise viewed toward rotor
- Degree of protection: Motor: IP 24 KM, electronics: IP 6K9K
- Insulation class: "B"
- Installation position: Any
- Mode: Continuous operation (S1)
- Mounting: Maintenance-free ball bearings
- Motor protection: Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- EMC regulations: VDE 0879-2
- Qualified in accordance with: DIN ISO 16750
- Approvals: E1 in preparation

Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Nominal voltage range</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Max. back pressure</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>kg</th>
<th>Tech. features and connection diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3G 250-EC24 -01(1)</td>
<td>M3G 074-BA</td>
<td>26</td>
<td>16-32</td>
<td>1240</td>
<td>2050</td>
<td>38</td>
<td>1,45</td>
<td>85</td>
<td>67</td>
<td>-40..+85</td>
<td>1,3</td>
<td>P. 84 / S</td>
<td>(1) 24-volt version</td>
</tr>
<tr>
<td>W3G 250-EC28 -11(2)</td>
<td>M3G 074-BA</td>
<td>26</td>
<td>16-32</td>
<td>1815</td>
<td>3000</td>
<td>115</td>
<td>4,40</td>
<td>170</td>
<td>76</td>
<td>-40..+85(2)</td>
<td>1,3</td>
<td>P. 84 / S</td>
<td>(2) above +70 °C with power derating</td>
</tr>
</tbody>
</table>

Subject to change

Curves:

Air performance measured according to ISO 5801, installation category A, without contact protection. Intake-side sound level:
L_{A, 10} according to ISO 13347, L_{w A} measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 66 ff for detailed information.
EC axial fan
for automotive applications, Ø 280

- **Material:** Housing: PP plastic, black (according to UL 94 HB)
  Blades: PBT plastic, black (according to UL 94 HB)
- **Airflow direction:** “V” (intake over the rotor)
- **Direction of rotation:** Clockwise viewed toward rotor
- **Degree of protection:** IP 24 KM
- **Insulation class:** “B” according to EN 60335-1
- **Installation position:** Any
- **Mode:** Continuous operation (S1)
- **Mounting:** Maintenance-free ball bearings
- **Motor protection:** Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- **EMC regulations:** VDE 0879-2
- **Approvals:** EAC, E1

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Nominal voltage range</th>
<th>Air flow</th>
<th>rpm</th>
<th>W</th>
<th>A</th>
<th>Pa</th>
<th>dB(A)</th>
<th>°C</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3G 280-E020</td>
<td>M3G 074-CF</td>
<td>(1)</td>
<td>26 16-32</td>
<td>2400</td>
<td>3100</td>
<td>200</td>
<td>7,5</td>
<td>---</td>
<td>79</td>
<td>-40..+85(2) 2,4</td>
<td>P.75 / HJ</td>
</tr>
</tbody>
</table>

Subject to change

(1) 24-volt version  
(2) at maximum back pressure, not recommended for continuous operation at 85°C

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Air performance measured according to ISO 5801, installation category A, without contact protection. Intake-side sound level: LwA, according to ISO 13347 / LpA measured at 1 meter distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Mating connector on customer circuit:

Housing: Tyco 1-967241-1
Plug contacts:
- 2.5 mm Tyco 929938-1 (2x)
- 0.75 mm Tyco 929930-3 (4x)
Seal: 828905-1 (2x) 828904-1 (4x)

Detail X
1 = UN black
2 = GND brown
3 = PWM/LIN yellow
4 = INVLIN orange
5 = ABSENK blue
6 = diagnostic output white
6-pole coded Tyco Junior Power Timer; Cable (460 mm) with mating connector
Part number 02002-4-1021 (not included in scope of delivery)
EC axial fan
for automotive applications, Ø 300

- **Material**: Housing: PA plastic, black (according to UL 94 HB)
  - Blades: PA plastic, black (according to UL 94 HB)
- **Airflow direction**: “V” (intake over the rotor)
- **Direction of rotation**: Clockwise viewed toward rotor
- **Degree of protection**: Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class**: “B” according to EN 60034-1
- **Installation position**: Any
- **Mode**: Continuous operation (S1)
- **Mounting**: Maintenance-free ball bearings
- **Motor protection**: Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- **EMC regulations**: VDE 0879-2
- **Qualified in accordance with**: DIN ISO 16750
- **Approvals**: EAC, E1

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>VDC</th>
<th>VDC</th>
<th>m³/h</th>
<th>rpm</th>
<th>W</th>
<th>A</th>
<th>dB(A)</th>
<th>°C</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3G 300-BV12 -41(1)</td>
<td>M3G 084-BF</td>
<td>13</td>
<td>9-16</td>
<td>2610</td>
<td>3200</td>
<td>220</td>
<td>16,7</td>
<td>---</td>
<td>83</td>
<td>-40-+105(2)</td>
</tr>
</tbody>
</table>

Subject to change (1) 12-volt version  (2) above +85 °C with power derating

### Curves:

- **Nominal voltage range**: 9-16 V
- **Speed**: 2610 rpm
- **Input power**: 220 W
- **Input current**: 16,7 A
- **Max. back pressure**: 83 dB(A)
- **Perm. ambient temp.**: -40-+105 °C
- **Sound power level**: 2,0 dB(A)
- **Weight**: P. 77 / K

Air performance measured according to: ISO 5801, installation category A, without contact protection, intake-side sound level:
- LwA, according to ISO 13347, LwA measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Mating connector on customer circuit:

1 = +UB     black
2 = GND     brown
3 = PWM/LIN*    yellow     *optional LIN-BUS
4 = NC     (not used)
5 = ABSENK    blue
6 = diagnostic output   white

6-pole coded Tyco Junior Power Timer;
Cable (460 mm) with mating connector
Part number 02002-4-1021 (not included in scope of delivery)

Housing: Tyco 1-967241-1
Plug contacts:
0.75 mm Typ 930330-1 (4x)
2.5 mm Typ 939038-1 (2x)

Mating connector on customer circuit:

1 = +UB
2 = GND
3 = PWM/LIN*
4 = NC (not used)
5 = ABSENK
6 = diagnostic output

6-pole coded Tyco Junior Power Timer
Cable (460 mm) with mating connector
Part number 02002-4-1021 (not included in scope of delivery)

Housing: Tyco 1-967241-1
Plug contacts:
0.75 mm Typ 930330-1 (4x)
2.5 mm Typ 939038-1 (2x)

Seal:  828905-1 (2x)
828904-1 (4x)

EC centrifugal fans - RadiCal
backward-curved

EC centrifugal fans forward-curved

EC axial fans “Basic”

EC axial fans “Premium & Power”

EC dual centrifugal fans with housing “Basic”

EC dual centrifugal fans with housing “Premium”

Information
EC axial fan
for automotive applications, Ø 300

- **Material**: Housing: PA plastic, black (according to UL 94 HB)
  Blades: PA plastic, black (according to UL 94 HB)
- **Airflow direction**: "V" (intake over the rotor)
- **Direction of rotation**: Clockwise viewed toward rotor
- **Degree of protection**: Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class**: "B" according to EN 60335-1
- **Installation position**: Any
- **Mode**: Continuous operation (S1)
- **Mounting**: Maintenance-free ball bearings
- **Motor protection**: Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- **EMC regulations**: VDE 0879-2
- **Qualified in accordance with**: DIN ISO 16750
- **Approvals**: EAC, E1

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>VDC</th>
<th>VDC</th>
<th>m³/h</th>
<th>rpm</th>
<th>W</th>
<th>A</th>
<th>Pa</th>
<th>dB(A)</th>
<th>°C</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3G 300-BS24 -01</td>
<td>M3G 084-BF</td>
<td>26</td>
<td>16-32</td>
<td>2570</td>
<td>3160</td>
<td>205</td>
<td>7,90</td>
<td>---</td>
<td>82</td>
<td>-40...+110</td>
<td>2,0</td>
</tr>
<tr>
<td>(1) 24-volt version</td>
<td>(2) above +95 °C with power derating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Subject to change

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Air performance measured according to ISO 5801, installation category A, without contact protection, intake-side sound level: LwA, according to ISO 13347, LpA measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Mating connector on customer circuit:
Housing: Tyco 1-967241-1
Plug contacts:
2.5 mm Tyco 929938-1 (2x)
0.75 mm Tyco 929930-3 (4x)
Seal: 828905-1 (2x)
828904-1 (4x)

Detail X
1 = +UB black
2 = GND brown
3 = PWM/LIN* yellow *optional LIN-BUS
4 = INV/LIN orange
5 = ABSENK blue
6 = diagnostic output white
6-pole coded Tyco Junior Power Timer;
Cable (460 mm) with mating connector
Part number 02002-4-1021 (not included in scope of delivery)
EC axial fan
for automotive applications, Ø 300

- **Material**: Housing: PA plastic, black (according to UL 94 HB)
  Blades: PA plastic, black (according to UL 94 HB)
- **Airflow direction**: “V” (intake over the rotor)
- **Direction of rotation**: Clockwise viewed toward rotor
- **Degree of protection**: Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class**: “B” according to EN 60034-1
- **Installation position**: Any
- **Mode**: Continuous operation (S1)
- **Mounting**: Maintenance-free ball bearings
- **Motor protection**: Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- **EMC regulations**: VDE 0879-2
- **Qualified in accordance with**: DIN ISO 16750
- **Approvals**: EAC, E1

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Normal voltage range</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Max. back pressure</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3G 300-BV24-01(1)</td>
<td>M3G 084-BF</td>
<td>26</td>
<td>16-32</td>
<td>2570</td>
<td>3160</td>
<td>205</td>
<td>7,90</td>
<td>---</td>
<td>82</td>
<td>-40...+110(2)</td>
<td>2,0</td>
<td></td>
</tr>
</tbody>
</table>

Subject to change

(1) 24-volt version  
(2) above +95 °C with power derating

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Air performance measured according to: ISO 5801, installation category A, without contact protection. Intake-side sound level: Lwa, according to ISO 13347, Lwa, measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 66 ff for detailed information.
Making connector on customer circuit:

- 1 = +UB     black
- 2 = GND     brown
- 3 = PWM/LIN*    yellow     *optional LIN-BUS
- 4 = INVLIN     orange
- 5 = ABSENK    blue
- 6 = diagnostic output   white

6-pole coded Tyco Junior Power Timer;
Cable (460 mm) with mating connector
Part number 02002-4-1021 (not included in scope of delivery)

EC centrifugal fans - RadiCal
- backward-curved
- forward-curved

EC axial fans
- “Basic”
- “Premium & Power”

EC dual centrifugal fans with housing
- “Basic”
- “Premium”

Information
EC axial fan
for automotive applications, Ø 300

- **Material:** Housing: PA plastic, black (according to UL 94 HB)
  Blades: PA plastic, black (according to UL 94 HB)
- **Airflow direction:** "V" (intake over the rotor)
- **Direction of rotation:** Clockwise viewed toward rotor
- **Degree of protection:** Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class:** "B" according to EN 60034-1
- **Installation position:** Any
- **Mode:** Continuous operation (S1)
- **Mounting:** Maintenance-free ball bearings
- **Motor protection:** Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- **EMC regulations:** VDE 0879-2
- **Qualified in accordance with:** DIN ISO 16750
- **Approvals:** EAC, E1

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>VDC</th>
<th>VDC</th>
<th>m³/h</th>
<th>rpm</th>
<th>W</th>
<th>A</th>
<th>Pa</th>
<th>dB(A)</th>
<th>°C</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3G 300-BV25 -21</td>
<td>M3G 084-BF</td>
<td>26</td>
<td>16-32</td>
<td>3225</td>
<td>3940</td>
<td>380</td>
<td>14,6</td>
<td>---</td>
<td>87</td>
<td>-40..+110(2)</td>
<td>2,0</td>
</tr>
</tbody>
</table>

Subject to change
(1) 24-volt version (2) above +85 °C with power derating

### Curves:

Air performance measured according to: ISO 5801, installation category A, without contact protection. Intake-side sound level: L_wA, according to ISO 13347, L_pA measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Mating connector on custom circuit:

1 = UB     black
2 = GND     brown
3 = PWM/LIN*    yellow     *optional LIN-BUS
4 = INVLIN     orange
5 = ABSENK    blue
6 = diagnostic output   white

6-pole coded Tyco Junior Power Timer;
Cable (460 mm) with mating connector
Part number 02002-4-1021 (not included in scope of delivery)

Information:
EC centrifugal fans - RadiCal
backward-curved
EC centrifugal fans
forward-curved
EC axial fans
“Basic”
EC axial fans
“Premium & Power”
EC dual centrifugal fans
with housing “Basic”
EC dual centrifugal fans
with housing “Premium”

2016-08
EC axial fan
for automotive applications, Ø 300

- Material: Housing: PA plastic, black (according to UL 94 HB)
  Blades: PA plastic, black (according to UL 94 HB)
- Airflow direction: “A” (intake over the stator)
- Direction of rotation: Clockwise viewed toward rotor
- Degree of protection: Motor: IP 24 KM, electronics: IP 66 / 69 K
- Insulation class: “B” according to EN 60034-1
- Installation position: Any
- Mode: Continuous operation (S1)
- Mounting: Maintenance-free ball bearings
- Motor protection: Thermal overload protection, reverse polarity and locked-rotor protection,
  load dump protection, undervoltage detection
- EMC regulations: VDE 0879-2
- Qualified in accordance with: DIN ISO 16750
- Approvals: EAC; E1 in preparation

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>VDC</th>
<th>VDC</th>
<th>m³/h</th>
<th>rpm</th>
<th>W</th>
<th>A</th>
<th>Pa</th>
<th>dB(A)</th>
<th>°C</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3G 300-PW24 -01(*)</td>
<td>M3G 084-BF</td>
<td>26</td>
<td>16-32</td>
<td>2955</td>
<td>3000</td>
<td>200</td>
<td>7,7</td>
<td>320</td>
<td>86</td>
<td>-40..+105(2)</td>
<td>2,0</td>
</tr>
</tbody>
</table>

Subject to change
(1) 24-volt version
(2) above +85 °C with power derating

### Curves:

<table>
<thead>
<tr>
<th>n (rpm)</th>
<th>P_{in} (W)</th>
<th>I (A)</th>
<th>L_{WA} (dB(A))</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000</td>
<td>209</td>
<td>7,70</td>
<td>86</td>
</tr>
<tr>
<td>2980</td>
<td>263</td>
<td>10,10</td>
<td>85</td>
</tr>
<tr>
<td>3010</td>
<td>310</td>
<td>11,93</td>
<td>83</td>
</tr>
<tr>
<td>2950</td>
<td>333</td>
<td>12,80</td>
<td>84</td>
</tr>
</tbody>
</table>

Air performance measured according to: ISO 5801, installation category A, without contact protection. Intake side sound level:
L_{WA}, according to ISO 13347, L_{WA} measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Connection diagram P: 79

Mating connector on customer circuit:
Housing: Tyco 1-967241-1
Plug contacts:
2.5 mm Tyco 929938-1 (2x)
0.75 mm Tyco 929930-3 (4x)
Seal: 828905-1 (2x)
828904-1 (4x)

Detail X
1 = +UB black
2 = GND brown
3 = PWM/LIN* yellow *optional LIN-BUS
4 = INVLIN orange
5 = ABSENK blue
6 = diagnostic output white
6-pole coded Tyco Junior Power Timer;
Cable (460 mm) with mating connector
Part number 02002-4-1021 (not included in scope of delivery)

EC centrifugal fans
- RadiCal

Technology
Agents
EC axial fan

for automotive applications, Ø 385

- **Material**: Housing: PA plastic, black (according to UL 94 HB)
  
  Blades: PA plastic, black (according to UL 94 HB)
  
- **Airflow direction**: "V" (intake over the rotor)
  
- **Direction of rotation**: Clockwise viewed toward rotor
  
- **Degree of protection**: Motor: IP 24 KM, electronics: IP 66 / 69 K
  
- **Insulation class**: “B” according to EN 60034-1
  
- **Installation position**: Any
  
- **Mode**: Continuous operation (S1)
  
- **Mounting**: Maintenance-free ball bearings
  
- **Motor protection**: Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
  
- **EMC regulations**: VDE 0879-2
  
- **Qualified in accordance with**: DIN ISO 16750
  
- **Approvals**: EAC, E1

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### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>VDC</th>
<th>VDC</th>
<th>m³/h</th>
<th>rpm</th>
<th>W</th>
<th>A</th>
<th>Pa</th>
<th>dB(A)</th>
<th>°C</th>
<th>kg</th>
</tr>
</thead>
</table>

---

Subject to change (1) 12-volt version (2) above +70 °C with power derating

---

Curve data:

- **Curves**: Air performance measured according to ISO 5801, installation category A, without contact protection, intake side sound level.
  
  LwA, according to ISO 13347, LpA, measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.

---

### Notes:

- Material:
  
  - Housing: PA plastic, black (according to UL 94 HB)
  
  - Blades: PA plastic, black (according to UL 94 HB)
  
- Direction of rotation:
  
  - Clockwise viewed toward rotor
  
- Degree of protection:
  
  
- Insulation class:
  
  - “B” according to EN 60034-1
  
- Installation position:
  
  - Any
  
- Mode:
  
  - Continuous operation (S1)
  
- Mounting:
  
  - Maintenance-free ball bearings
  
- Motor protection:
  
  - Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
  
- EMC regulations:
  
  - VDE 0879-2
  
- Qualified in accordance with:
  
  - DIN ISO 16750
  
- Approvals:
  
  - EAC, E1

---

### EC axial fan

for automotive applications, Ø 385

- Material: Housing: PA plastic, black (according to UL 94 HB)
  
  Blades: PA plastic, black (according to UL 94 HB)
  
- Airflow direction: "V" (intake over the rotor)
  
- Direction of rotation: Clockwise viewed toward rotor
  
- Degree of protection: Motor: IP 24 KM, electronics: IP 66 / 69 K
  
- Insulation class: “B” according to EN 60034-1
  
- Installation position: Any
  
- Mode: Continuous operation (S1)
  
- Mounting: Maintenance-free ball bearings
  
- Motor protection: Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
  
- EMC regulations: VDE 0879-2
  
- Qualified in accordance with: DIN ISO 16750
  
- Approvals: EAC, E1

---

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>VDC</th>
<th>VDC</th>
<th>m³/h</th>
<th>rpm</th>
<th>W</th>
<th>A</th>
<th>Pa</th>
<th>dB(A)</th>
<th>°C</th>
<th>kg</th>
</tr>
</thead>
</table>

---

Subject to change (1) 12-volt version (2) above +70 °C with power derating

---

Curve data:

- **Curves**: Air performance measured according to ISO 5801, installation category A, without contact protection, intake side sound level.
  
  LwA, according to ISO 13347, LpA, measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Connection diagram P. 78

Detail X

1 = +UB   black
2 = diagnostic output white
3 = PWM/LIN* yellow  *optional LIN-BUS
4 = GND   brown

Mating connector on customer circuit:
Housing:    DELPHI 13873952
Plug contacts: 9.5 mm DELPHI 10811262
4.8 mm DELPHI 10782969
Seal:    DELPHI 15327788
DELPHI 10788269

EC centrifugal fans
RadiCal
backward-curved

EC centrifugal fans
forward-curved

EC axial fans
"Basic"

EC axial fans
"Premium & Power"

EC dual centrifugal fans
with housing "Basic"

EC dual centrifugal fans
with housing "Premium"

Information
EC axial fan
for automotive applications, Ø 385

- **Material**: Housing: PA plastic, black (according to UL 94 HB)
  Blades: PA plastic, black (according to UL 94 HB)
- **Airflow direction**: "V" (intake over the rotor)
- **Direction of rotation**: Clockwise viewed toward rotor
- **Degree of protection**: Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class**: "B" according to EN 60034-1
- **Installation position**: Any
- **Mode**: Continuous operation (S1)
- **Mounting**: Maintenance-free ball bearings
- **Motor protection**: Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- **EMC regulations**: VDE 0879-2
- **Qualified in accordance with**: DIN ISO 16750
- **Approvals**: EAC, E1

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Normal voltage range</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Max. back pressure</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>Kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3G 385-BV44</td>
<td>M3G 084-BF</td>
<td>26</td>
<td>16-32</td>
<td>3425</td>
<td>2600</td>
<td>260</td>
<td>10,0</td>
<td>---</td>
<td>84</td>
<td>-40...+110</td>
<td>2,7</td>
<td></td>
</tr>
</tbody>
</table>

Subject to change

(1) 24-volt version
(2) above +95 °C with power derating

### Curves:

- **n**: rpm
- **P<sub>ad</sub>**: W
- **I**: A
- **L<sub>WA</sub>**: dB(A)

Air performance measured according to ISO 5801, installation category A, without contact protection. Intake side sound level:

- L<sub>wa</sub>, according to ISO 13347
- L<sub>wa</sub>, measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Mating connector on customer circuit:

- 1 = +UB  black
- 2 = GND  brown
- 3 = PWM/LIN*  yellow  *optional LIN-BUS
- 4 = INVLIN  orange
- 5 = ABSENK  blue
- 6 = diagnostic output  white

6-pole coded Tyco Junior Power Timer;
Cable (460 mm) with mating connector
Part number 02002-4-1021 (not included in scope of delivery)

Housing: Tyco 1-974-241-1
Plug contacts:
- 2.5 mm Tyco 929383-1 (2)
- 0.75 mm Part number 82889-1 (12)

Seal:
- Part number 82935-2 (12)
- Part number 82894-1 (4)

EC centrifugal fans
- RadiCal
- backward-curved

EC dual centrifugal fans
- with housing
- "Basic"
- "Premium & Power"
EC axial fan
for automotive applications, Ø 385

- Material: Housing: PA plastic, black (according to UL 94 HB)
  Blades: PA plastic, black (according to UL 94 HB)
- Airflow direction: "V" (intake over the rotor)
- Direction of rotation: Clockwise viewed toward rotor
- Degree of protection: Motor: IP 24 KM, electronics: IP 66 / 69 K
- Insulation class: "B" according to EN 60034-1
- Installation position: Any
- Mode: Continuous operation (S1)
- Mounting: Maintenance-free ball bearings
- Motor protection: Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- EMC regulations: VDE 0879-2
- Qualified in accordance with: DIN ISO 16750
- Approvals: EAC, E1

<table>
<thead>
<tr>
<th>Nominal data</th>
<th>Motor</th>
<th>Curve</th>
<th>Normal voltage range</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Max. back pressure</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>Jug. features and connection diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>W3G 385-BS44 -01(1)</td>
<td>M3G 084-BF</td>
<td>26</td>
<td>16-32</td>
<td>3425</td>
<td>2600</td>
<td>260</td>
<td>10,0</td>
<td>---</td>
<td>84</td>
<td>40...+110(2)</td>
<td>2,7 P. 79 / DJ</td>
</tr>
</tbody>
</table>

Subject to change (1) 24-volt version (2) above +95 °C with power derating

Curves:

Air performance measured according to ISO 5801, installation category A, without contact protection. Intake-side sound level: LwA, according to ISO 12447, LwA measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.

- Material: Housing: PA plastic, black (according to UL 94 HB)
- Blades: PA plastic, black (according to UL 94 HB)
- Airflow direction: "V" (intake over the rotor)
- Direction of rotation: Clockwise viewed toward rotor
- Degree of protection: Motor: IP 24 KM, electronics: IP 66 / 69 K
- Insulation class: "B" according to EN 60034-1
- Installation position: Any
- Mode: Continuous operation (S1)
- Mounting: Maintenance-free ball bearings
- Motor protection: Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- EMC regulations: VDE 0879-2
- Qualified in accordance with: DIN ISO 16750
- Approvals: EAC, E1
Mating connector on customer circuit:

1 = +UB     black
2 = GND     brown
3 = PWM/LIN*    yellow     *optional LIN-BUS
4 = INVLIN     orange
5 = ABSENK    blue
6 = diagnostic output   white

Part number 02002-4-1021 (not included in scope of delivery)

Cable (460 mm) with mating connector:

Housing: Tyco 1-967241-1
Plug contacts:
2.5 mm Tyco 526668-1 (2x)
0.75 mm Tyco 526663-3 (4x)
Seal:  82995-1 (2x)
82994-1 (4x)

Mating connector on customer circuit:

Housing: Tyco Power Timer:
6-pole coded Tyco Junior Power Timer;
Cable (460 mm) with mating connector.
Part number 02002-4-1021 (not included in scope of delivery)
EC axial fan
for automotive applications, Ø 385

- **Material:** Housing: PA plastic, black (according to UL 94 HB)
  - Blades: PA plastic, black (according to UL 94 HB)
- **Airflow direction:** "V" (intake over the rotor)
- **Direction of rotation:** Clockwise viewed toward rotor
- **Degree of protection:** Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class:** "B" according to EN 60034-1
- **Installation position:** Any
- **Mode:** Continuous operation (S1)
- **Mounting:** Maintenance-free ball bearings
- **Motor protection:** Thermal overload protection, reverse polarity and locked-rotor protection, load dump protection, undervoltage detection
- **EMC regulations:** VDE 0879-2
- **Qualified in accordance with:** DIN ISO 16750
- **Approvals:** EAC, E1

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Normal voltage range</th>
<th>Air flow</th>
<th>rpm</th>
<th>Input power</th>
<th>Input current</th>
<th>Max. back pressure</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>Tech. features and connection diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3G 385-CT65 -21(^{(1)})</td>
<td>M3G 084-CF</td>
<td>26</td>
<td>16-32</td>
<td>4375</td>
<td>3300</td>
<td>525</td>
<td>20.0</td>
<td>---</td>
<td>90</td>
<td>-40...+110(^{(2)})</td>
<td>3.1</td>
<td>P. 78 / Lf</td>
</tr>
</tbody>
</table>

Subject to change

\(^{(1)}\) 24-volt version  \(^{(2)}\) above +85 °C with power derating

---

### Curves:

Air performance measured according to ISO 5801, installation category A, without contact protection. Intake side sound level: $L_{wA}$, according to ISO 13347, $L_{pA}$ measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 56 ff for detailed information.

<table>
<thead>
<tr>
<th>n rpm</th>
<th>$P_{in}$ W</th>
<th>I A</th>
<th>$L_{wA}$ dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3300</td>
<td>525</td>
<td>20.0</td>
<td>90</td>
</tr>
<tr>
<td>3180</td>
<td>615</td>
<td>23.7</td>
<td>89</td>
</tr>
<tr>
<td>3050</td>
<td>610</td>
<td>23.5</td>
<td>88</td>
</tr>
<tr>
<td>2920</td>
<td>610</td>
<td>23.6</td>
<td>88</td>
</tr>
</tbody>
</table>
Detail X

1 = UB   black
2 = diagnostic output  white
3 = PWM/LIN*  yellow     *optional LIN-BUS
4 = GND   brown

Housing:    DELPHI 13873952
Plug contacts: 9.5 mm DELPHI 10811299
4.8 mm DELPHI 10882389
Seal:    DELPHI 15327788
DELPHI 10788269

EC centrifugal fans - RadiCal
backward-curved

EC centrifugal fans forward-curved

EC axial fans “Basic”

EC axial fans “Premium & Power”

EC dual centrifugal fans with housing “Basic”

EC dual centrifugal fans with housing “Premium”

Information
EC axial fans
with brushless DC motor "Basic"
EC axial fan
for automotive applications, Ø 300

- **Material:** Housing: PP plastic, black (according to UL 94 HB)
  Blades: PP plastic, black (according to UL 94 HB)
- **Airflow direction:** "V" (intake over the rotor)
- **Direction of rotation:** Clockwise viewed toward rotor
- **Degree of protection:** Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class:** "B" according to EN 60335-1
- **Installation position:** Any
- **Mode:** Continuous operation (S1)
- **Mounting:** Maintenance-free ball bearings
- **Motor protection:** Locked-rotor protection
- **Approvals:** E1 in preparation

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>VDC</th>
<th>rpm</th>
<th>W</th>
<th>A</th>
<th>Pa</th>
<th>dB(A)</th>
<th>°C</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1G 300-EC12-20(1)</td>
<td>M1G 074-CF</td>
<td>13</td>
<td>2340</td>
<td>2500</td>
<td>145</td>
<td>11,0</td>
<td>160</td>
<td>76</td>
<td>-40...+85(2)</td>
</tr>
</tbody>
</table>

Subject to change

(1) 13-volt version
(2) above +70 °C with power derating

---

**Curves:**

Air performance measured according to: ISO 5801, installation category A, without contact protection. Intake-side sound level:
$L_w$ according to ISO 13347, $L_p$ measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Mating connector on customer circuit:
- Housing: TE MCP 2.8, 3-pole 1-1718627-1
- Plug contacts: 2x 1-968857-1
  1x 1-968855-1
- Seal: 2x 828905-1
  1x 828904-1
- Cable with mating connector not included in scope of delivery.

On both sides for screws for fastening plastics, Ø 3.5 mm

Detail X
- 1 = + UB
- 2 = 0–10 V
- 3 = GND
EC axial fan
for automotive applications, Ø 300

- **Material:** Housing: PP plastic, black (according to UL 94 HB)
  Blades: PA plastic, black (according to UL 94 HB)
- **Airflow direction:** "V" (intake over the rotor)
- **Direction of rotation:** Clockwise viewed toward rotor
- **Degree of protection:** Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class:** "B" according to EN 60335-1
- **Installation position:** Any
- **Mode:** Continuous operation (S1)
- **Mounting:** Maintenance-free ball bearings
- **Motor protection:** Locked-rotor protection
- **Approvals:** E1 in preparation

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>VDC</th>
<th>VDC</th>
<th>Nominal voltage range</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Max. back pressure</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>Tech. features and connection diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1G 300-EC24 -01(1)</td>
<td>M1G 074-CF</td>
<td>26</td>
<td>18-32</td>
<td>2840</td>
<td>3100</td>
<td>250</td>
<td>9,60</td>
<td>---</td>
<td>81</td>
<td>-40...+85(2)</td>
<td>2,6</td>
<td>P. 80 / M)</td>
<td></td>
</tr>
</tbody>
</table>

Subject to change (1) 24-volt version         (2) above +70 °C with power derating

### Curves:

Air performance measured according to: ISO 5801, installation category A, without contact protection. Intake-side sound level: Lw A, according to ISO 13347, Lp A measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Connection diagram P. 80
Guard grille P. 72
Cable P. 70

EC centrifugal fans
- RadiCal

Technology
EC centrifugal fans - backward curved
EC centrifugal fans - forward curved
EC axial fans - "Basic"
EC axial fans - "Premium & Power"
EC dual centrifugal fans - "Basic"
EC dual centrifugal fans - "Premium"

On both sides for screws for fastening plastics, Ø 3.5 mm

Mating connector on customer circuit:
Housing: TE MCP 2.6.3 pole 1-1718627-1
Plug contacts: 2x 1-968857-1
1x 1-968855-1

Cable with mating connector not included in scope of delivery.

Seal: 2x 83895-1
1x 83804-1

Agents
Information

<table>
<thead>
<tr>
<th>Agents</th>
<th>Technology</th>
<th>EC centrifugal fans - RadiCal backward-curved</th>
<th>EC centrifugal fans forward-curved</th>
<th>EC axial fans &quot;Basic&quot;</th>
<th>EC axial fans &quot;Premium &amp; Power&quot;</th>
<th>EC dual centrifugal fans with housing &quot;Basic&quot;</th>
<th>EC dual centrifugal fans with housing &quot;Premium&quot;</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable</td>
<td>P. 70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guard grille</td>
<td>P. 72</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection diagram</td>
<td>P. 80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
EC centrifugal fans
forward-curved, single inlet
EC centrifugal fan
forward curved, single inlet, for automotive applications

- Material: Cover: PP plastic
  Impeller: PA plastic
- Direction of rotation: Clockwise viewed toward rotor
- Degree of protection: Motor: IP 24 KM, electronics: IP 6K9K
- Insulation class: “B”
- Installation position: Any
- Condensation drainage holes: None, open rotor
- Mode: Continuous operation (S1)
- Mounting: Maintenance-free ball bearings
- Motor protection: Locked-rotor protection
- Approvals: E1 in preparation

## Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Normal voltage</th>
<th>Normal voltage range</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Max. back pressure</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>Tech. features and connection diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>R3G 146-EC50 -01(1)</td>
<td>M3G 084-BF</td>
<td></td>
<td>VDC</td>
<td>26</td>
<td>16-32</td>
<td>815</td>
<td>2750</td>
<td>280</td>
<td>10,8</td>
<td>0</td>
<td>-40...+85(2)</td>
<td>1,5</td>
<td>P. 84 / S</td>
</tr>
</tbody>
</table>

Subject to change
(1) 24-volt version
(2) above +75 °C with power derating

### Curves:

Air performance measured according to ISO 5801, installation category A, in ebm-papst inlet ring without contact protection.
Intake-side sound level, Lw A, according to ISO 13347, Lp A, measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Mating connector on customer circuit:
Housing: TE MCP 2.8, 4-pole 1-1718628-1
Plug contacts: 2x 1-968857-1
2x 1-968855-1
Seal: 2x 828905-1
2x 828904-1
Cable with mating connector not included in scope of delivery.

Detail X
4-pole connector, pluggable with cable from accessories
(not included in scope of delivery)
1 = diagnostic output
2 = PWM
3 = + UB
4 = GND

Accessory part: Inlet ring 09576-2-4013
Not included in scope of delivery
Dimensions: see “Accessories” chapter
EC centrifugal fans - RadiCal
backward curved, with brushless DC motor
**EC centrifugal fan - RadiCal**

backward curved, for automotive applications, Ø 220

- **Material:** Impeller: Glass-fiber reinforced PA plastic (according to UL 94 V0)
  - Rotor: Galvanized
  - Electronics housing: Die-cast aluminum, painted black
- **Number of blades:** 7
- **Direction of rotation:** Clockwise viewed toward rotor
- **Degree of protection:** Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class:** “B”
- **Installation position:** Shaft horizontal or rotor on bottom, rotor on top on request
- **Condensation drainage holes:** Rotor side
- **Mode:** Continuous operation (S1)
- **Mounting:** Maintenance-free ball bearings
- **Motor protection:** Reverse polarity and locked-rotor protection
- **Approvals:** EAC

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Normal voltage range</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>Tech. features and connection diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1G 220-RD04 -03</td>
<td>M1G 074-BF</td>
<td>12</td>
<td>8-16</td>
<td>920</td>
<td>2720</td>
<td>87</td>
<td>8,4</td>
<td>74</td>
<td>-40...+60</td>
<td>1.5</td>
<td>P. 82 / N (1)</td>
</tr>
<tr>
<td>R1G 220-RD87 -03</td>
<td>M1G 074-BF</td>
<td>24</td>
<td>16-28</td>
<td>1090</td>
<td>3130</td>
<td>120</td>
<td>6,5</td>
<td>78</td>
<td>-40...+60</td>
<td>1.5</td>
<td>P. 82 / N (1)</td>
</tr>
</tbody>
</table>

Subject to change

### Curves:

Air performance measured according to: ISO 5801, installation category A, in ebm-papst inlet ring without contact protection.

Intake-side sound level: $L_{w A}$ according to ISO 13347, $L_{p A}$ measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
Accessory part: inlet ring 09609-2-4013, not included in scope of delivery.

Terminal assignment
- UN: red
- PWM/LIN: yellow
- DUE: white
- GND: blue

Cable: FLRYW 4x 0.75 mm², 4x crimped splices

Max. clearance for screw 6 mm
EC centrifugal fan - RadiCal
backward curved, for automotive applications, Ø 250

- **Material:** Impeller: Glass-fiber reinforced PA plastic (according to UL 94 V0)
  Rotor: Galvanized
Electronics housing: Die-cast aluminum, painted black
- **Number of blades:** 7
- **Direction of rotation:** Clockwise viewed toward rotor
- **Degree of protection:** Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class:** “B”
- **Installation position:** Shaft horizontal or rotor on bottom, rotor on top on request
- **Condensation drainage holes:** Rotor side
- **Mode:** Continuous operation (S1)
- **Mounting:** Maintenance-free ball bearings
- **Motor protection:** Reverse polarity and locked-rotor protection
- **Approvals:** EAC

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Nominal voltage range</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>Kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1G 250-RC67-03</td>
<td>M1G 074-CF</td>
<td>12</td>
<td>8-16</td>
<td>1030</td>
<td>2000</td>
<td>65</td>
<td>6.4</td>
<td>71</td>
<td>-40..+70</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1G 250-RC75-03</td>
<td>M1G 074-CF</td>
<td>24</td>
<td>16-28</td>
<td>1325</td>
<td>2550</td>
<td>130</td>
<td>7.1</td>
<td>76</td>
<td>-40..+60</td>
<td>1.5</td>
<td></td>
</tr>
</tbody>
</table>

Subject to change

### Curves:

Air performance measured according to ISO 5801, installation category A, in ebm-papst inlet ring without contact protection.
Intake-side sound level, L_{IA}, according to ISO 13347, L_{PA}, measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.
EC centrifugal fan - RadiCal
backward curved, for automotive applications, Ø 280

- **Material:** Impeller: Glass-fiber reinforced PA plastic (according to UL 94 V0, EN 45545-2 / HL3)
  Rotor: Painted black
  Electronics housing: Die-cast aluminum, painted black
- **Number of blades:** 5
- **Direction of rotation:** Clockwise viewed toward rotor
- **Degree of protection:** Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class:** “B”
- **Installation position:** Any
- **Condensation drainage holes:** Rotor side
- **Mode:** Continuous operation (S1)
- **Mounting:** Maintenance-free ball bearings

### Nominal data

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Normal voltage range</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>Tech. features and connection diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>R3G 280-RU26 -81(1)</td>
<td>M3G 084-CF</td>
<td>26</td>
<td>16-32</td>
<td>2740</td>
<td>2350</td>
<td>252</td>
<td>10,5</td>
<td>80</td>
<td>-40..+60</td>
<td>3,0</td>
<td>P. 81 / P)</td>
</tr>
</tbody>
</table>

Subject to change (1) 24-volt version (also available as a 12-volt version)

### Curves:

Air performance measured according to: ISO 5801, installation category A, in ebm-papst inlet ring without contact protection.
Intake-side sound level: Lw A  according to ISO 13347, Lp A  measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 86 ff for detailed information.

<table>
<thead>
<tr>
<th>n rpm</th>
<th>P ed W</th>
<th>I A</th>
<th>L wA dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2350</td>
<td>252</td>
<td>10,5</td>
<td>80</td>
</tr>
<tr>
<td>2280</td>
<td>298</td>
<td>12,4</td>
<td>75</td>
</tr>
<tr>
<td>2265</td>
<td>309</td>
<td>12,9</td>
<td>73</td>
</tr>
<tr>
<td>2305</td>
<td>278</td>
<td>11,6</td>
<td>74</td>
</tr>
</tbody>
</table>
- **Technical features**: See connection diagram P. 81
- **Cable exit**: To the side
- **Protection class**: III
- **Approvals**: EAC, E1

Max. clearance for screw 10 mm, tapping hole ready for self-tapping M5 screw.

Max. clearance for screw 8 mm, tapping hole ready for self-tapping M4 screw.

Max. clearance for screw 12 mm, tapping hole ready for self-tapping M6 screw.

Accessory part:
- **inlet ring 28000-2-4013**
  - not included in scope of delivery.

Cable:
- 2x 2.5 mm²
- 4x 1.0 mm²
- 6x crimped ferrules

Terminal assignment:
- **UN +26 VDC**: black
- **GND**: brown
- **PWM/LIN**: yellow
- **INVLIN**: orange
- **ABSENK**: blue
- **DU**: white

Max. clearance for screw 10 mm, tapping hole ready for self-tapping M5 screw.
**EC centrifugal fan - RadiCal**
backward curved, for automotive applications, Ø 280

- **Material:** Impeller: Glass-fiber reinforced PA plastic (according to UL 94 V0, EN 45545-2 / HL3)
  Rotor: Painted black
- **Electronics housing:** Die-cast aluminum, painted black
- **Number of blades:** 5
- **Direction of rotation:** Clockwise viewed toward rotor
- **Degree of protection:** Motor: IP 24 KM, electronics: IP 66 / 69 K
- **Insulation class:** “B”
- **Installation position:** Any
- **Condensation drainage holes:** Rotor side
- **Mode:** Continuous operation (S1)
- **Mounting:** Maintenance-free ball bearings

<table>
<thead>
<tr>
<th>Nominal data</th>
<th>Type</th>
<th>Motor</th>
<th>Curve</th>
<th>Normal voltage</th>
<th>Normal voltage range</th>
<th>Air flow</th>
<th>Speed</th>
<th>Input power</th>
<th>Input current</th>
<th>Sound power level</th>
<th>Perm. ambient temp.</th>
<th>Weight</th>
<th>TECH. FEATURES and connection diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nominal voltage</td>
<td>Nominal voltage range</td>
<td>Air flow</td>
<td>rpm</td>
<td>W</td>
<td>A</td>
<td>dB(A)</td>
<td>°C</td>
<td>kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R3G 280-RU65-82</td>
<td>M3G 084-CF</td>
<td>24</td>
<td>16-32</td>
<td>3345</td>
<td>2830</td>
<td>460</td>
<td>19.0</td>
<td>85</td>
<td>-40...+60</td>
<td>3.0</td>
<td>P. 76 / 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Subject to change

### Curves:

**Air performance measured according to: ISO 5801, installation category A, in ebm-papst inlet ring without contact protection.**

<table>
<thead>
<tr>
<th>n</th>
<th>P&lt;sub&gt;ed&lt;/sub&gt;</th>
<th>I</th>
<th>L&lt;sub&gt;W A&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>2830</td>
<td>460</td>
<td>19.00</td>
<td>85</td>
</tr>
<tr>
<td>2830</td>
<td>595</td>
<td>24.69</td>
<td>81</td>
</tr>
<tr>
<td>2815</td>
<td>651</td>
<td>27.08</td>
<td>77</td>
</tr>
<tr>
<td>2845</td>
<td>631</td>
<td>26.19</td>
<td>77</td>
</tr>
</tbody>
</table>

The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 66 ff for detailed information.
- **Technical features**: See connection diagram P. 76
- **Cable exit**: To the side
- **Protection class**: III
- **Approvals**: EAC, E1 in preparation

Max. clearance for screw 10 mm, tapping hole ready for self-tapping M5 screw.

Max. clearance for screw 8 mm, tapping hole ready for self-tapping M4 screw.

Max. clearance for screw 12 mm, tapping hole ready for self-tapping M6 screw.

Accessory part:
- inlet ring 28000-2-4013
- not included in scope of delivery

Cable:
- 2x 6 mm², 2x 1.0 mm², 4x crimped ferrules

Terminal assignment
- UN +26 VDC black
- GND brown
- PWM/LIN yellow
- DU white

Maximal clearance for screw 8 mm, tapping hole ready for self-tapping M4 screw.

Maximal clearance for screw 12 mm, tapping hole ready for self-tapping M6 screw.

Maximal clearance for screw 10 mm, tapping hole ready for self-tapping M5 screw.
### Cables

<table>
<thead>
<tr>
<th>Part number</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>02001-4-1021</td>
<td>EC dual centrifugal fan with housing</td>
</tr>
<tr>
<td>02002-4-1021</td>
<td>EC axial fan</td>
</tr>
<tr>
<td>02020-4-1021</td>
<td>W1G 300-EC</td>
</tr>
</tbody>
</table>

Subject to change
## Cables

<table>
<thead>
<tr>
<th>Part number</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>02025-4-1021</td>
<td>W3G 250-EC</td>
</tr>
<tr>
<td>02040-4-1021</td>
<td>R3G 146-EC</td>
</tr>
</tbody>
</table>

Subject to change
Part number
18600-2-4039
Application
W1G 300-EC

Guard grille

Part number
09609-2-4013
Application
R1G 220-RD87-02

Inlet ring*

Part number
09609-2-4013
Application
R1G 220-RD87-02

Subject to change
*The inlet rings for the R1G 250 and R1G 260 are pictured fully dimensioned on the respective product pages.
<table>
<thead>
<tr>
<th>Part number</th>
<th>Application</th>
<th>Inlet ring</th>
<th>Guard grille</th>
</tr>
</thead>
<tbody>
<tr>
<td>09576-2-4039</td>
<td>W3G 250-EC</td>
<td>R03 146-EC50-01</td>
<td>19885-2-4039</td>
</tr>
<tr>
<td>09576-2-4013</td>
<td>R3G 146-EC50-01</td>
<td>R03 146-EC50-01</td>
<td>R03 250-EC</td>
</tr>
</tbody>
</table>

**Agents**
- EC centrifugal fans - RadiCal
- EC centrifugal fans - backward-curved
- EC centrifugal fans - forward-curved
- EC axial fans - "Basic"
- EC axial fans - "Premium & Power"
- EC dual centrifugal fans with housing - "Basic"
- EC dual centrifugal fans with housing - "Premium"

**Information**

Subject to change
Connection diagram: A)  
13 VDC (EC dual centrifugal fan with housing "Premium")

Connection diagram: F)  
26 VDC (EC dual centrifugal fan with housing "Basic")
Connection diagram: H)
26 VDC (EC axial fan "Premium")

Notes on various control possibilities and their applications

The blower speed is determined by the input (pin 3, 4) that gives the higher speed.

- **PWM 5 Hz - 100 kHz**
- **Speed setting with potentiometer**
  - Full speed
  - Standby
  - 100 % PWM -> n=max
  - 15 % PWM -> n=min
  - 0 % PWM -> Standby

- **0 V - 10 V**
  - 10 V -> n=max
  - 1,5 V -> n=min
  - 0 V -> Standby

- **Diagnostic output**
  - Operation: output level low (U = 0 V)
  - Rotor locked or overvoltage/undervoltage: output level high (U = UB - 2 V)
  - Imax = 50 mA
  - Collective fault signal possible

- **Input**
  - UB -> n/2
  - open -> n

**Connection Fan**

- **1 (black)**
  - UB to 26 VDC
- **2 (blue)**
  - PWM/LIN 0 V to 10 V
- **3 (yellow)**
  - Diagnostic output
- **4 (green)**
  - INVLIN
- **5 (brown)**
  - RE typ. 100 k
- **6 (red)**
  - Switch
  - on: typ. 1.5 V
  - off: typ. 1 V
- **7 (white)**
  - Speed setting: 21 V -> n=min
  - 0 V -> n=max
  - UB -> Standby

**Motor**

- **Motor turns**
  - Switch-on threshold
  - 32 V
  - U
- **Motor stops**
  - Switch-off threshold
  - 21 V
  - 21 V 32 V
  - UB
  - Speed - lower

**Customer circuit**

- **Connection**
Technical features:
- Control input 0-10 VDC / PWM
- Fault output (high-side switch max. 30 mA)
- Undervoltage detection
- Temperature derating
- Soft start / reverse polarity and locked-rotor protection
- Thermal overload protection for electronics
- Motor current limitation
- Overvoltage detection
- Load dump (58 V)

Connection diagram: S)
26 VDC (R3G 280-RU65-82)

<table>
<thead>
<tr>
<th>Connection</th>
<th>Designation</th>
<th>Color</th>
<th>Assignment/function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UB +26 VDC</td>
<td>black</td>
<td>Power supply 26 VDC</td>
</tr>
<tr>
<td>2</td>
<td>DIAG</td>
<td>white</td>
<td>Diagnostic output</td>
</tr>
<tr>
<td>3</td>
<td>PWM/LIN</td>
<td>yellow</td>
<td>Analog voltage control input 0-10 V or PWM</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
<td>brown</td>
<td>Power supply GND, reference ground</td>
</tr>
</tbody>
</table>
**Technical features:**
- Control input 0-10 VDC / PWM
- Lowering input
- Fault output (high-side switch max. 30 mA)
- Undervoltage detection
- Power limiter
- Reverse polarity and locked-rotor protection
- Soft start
- Thermal overload protection for electronics
- Motor current limitation
- Overvoltage detection
- Temperature derating
- Load dump (58 V)

**Customer circuit**

- **Speed setting with potentiometer**
  - 100% PWM: \( n = \text{max} \)
  - 10% PWM: \( n = \text{min} \)
  - <10% PWM: \( n = 0 \)

- **Diagnostic output**
  - Operation: Output level low (\( U = 0 \) V)
  - Rotor blocked or overvoltage/undervoltage
  - Output level high (\( U = UB - 2 \) V)
  - \( Imax = 50 \) mA
  - Collective fault signal possible

---

**Connection diagram: K)**

13 VDC (EC axial fan "Premium")

### Connection

<table>
<thead>
<tr>
<th>Number</th>
<th>Designation</th>
<th>Color</th>
<th>Assignment/function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+UB</td>
<td>black</td>
<td>Power supply</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>brown</td>
<td>Power supply GND, reference ground</td>
</tr>
<tr>
<td>3</td>
<td>PWM/LIN</td>
<td>yellow</td>
<td>Analog voltage control input 0-10 V or PWM</td>
</tr>
<tr>
<td>4</td>
<td>NC</td>
<td>orange</td>
<td>Not used / no function</td>
</tr>
<tr>
<td>5</td>
<td>ABSENK</td>
<td>blue</td>
<td>Lowering input</td>
</tr>
<tr>
<td>6</td>
<td>DIAG</td>
<td>white</td>
<td>Diagnostic output</td>
</tr>
</tbody>
</table>

- Operation: Output level low (\( U = 0 \) V)
- Rotor blocked or overvoltage/undervoltage
- Output level high (\( U = UB - 2 \) V)
- \( Imax = 50 \) mA
- Collective fault signal possible
Connection diagram: L)
13/26 VDC (EC axial fan “Power”)

Technical features:
- Control input 0-10 VDC / PWM
- Fault output (high-side switch max. 30 mA)
- Undervoltage detection
- Temperature derating / power limiter
- Soft start / reverse polarity and locked-rotor protection
- Thermal overload protection for electronics
- Motor current limitation
- Overvoltage detection
- Load dump (58 V)

Customer circuit

Connection

Designation | Color | Assignment/function
---|---|---
1 | UB | Power supply
2 | DIAG | Diagnostic output
3 | PWM/LIN | Analog voltage control input 0-10 V or PWM
4 | GND | Power supply GND, reference ground
### Technical features:
- Control input 0-10 VDC / PWM
- Lowering input
- INVLIN (inverse linear control input)
- Fault output (high-side switch max. 30 mA)
- Undervoltage detection
- Power limiter
- Reverse polarity and locked-rotor protection
- Soft start
- Thermal overload protection for electronics

### Customer circuit

#### Full speed
- Operation: Speed setting
- UB: 1.5-10V
- UB: approx. n/2
- Open: n

#### Speed setting
- 100% PWM: n = max
- 10% PWM: n = min
- <1V: n = 0

#### Speed lowering input
- Speed setting with potentiometer
- Speed lowering input
- UB: approx. n/2
- Open: n

#### Diagnostic output
- Operation: Output level low (U = 0 V)
- Rotor blocked or overvoltage/undervoltage
- Output level high (U = UB - 2 V)
- Imax = 50 mA
- Collective fault signal possible

### Connection diagram: D)

26 VDC (EC axial fan “Premium & Power”)

### Connection

<table>
<thead>
<tr>
<th>Connection</th>
<th>Designation</th>
<th>Color</th>
<th>Assignment/function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+UB</td>
<td>black</td>
<td>Power supply</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>brown</td>
<td>Power supply GND, reference ground</td>
</tr>
<tr>
<td>3</td>
<td>PWM/LIN</td>
<td>yellow</td>
<td>Analog voltage control input 0-10 V or PWM</td>
</tr>
<tr>
<td>4</td>
<td>INVLIN</td>
<td>orange</td>
<td>Control input, inverse linear</td>
</tr>
<tr>
<td>5</td>
<td>ABSENK</td>
<td>blue</td>
<td>Lowering input</td>
</tr>
<tr>
<td>6</td>
<td>DIAG</td>
<td>white</td>
<td>Diagnostic output</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Operation: Output level low (U = 0 V)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Rotor blocked or overvoltage/undervoltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Output level high (U = UB - 2 V)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Imax = 50 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Collective fault signal possible</td>
</tr>
</tbody>
</table>
### Technical features:
- Control input 0-10 VDC / PWM
- Undervoltage detection
- Locked-rotor protection
- Soft start
- Thermal overload protection for electronics
- Motor current limitation
- Overvoltage detection
- Temperature derating

### Connection diagram: M)
26 VDC (W1G 300-EC24-01)

---

**Customer circuit**

<table>
<thead>
<tr>
<th>Full speed</th>
<th>Adjustable speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>U1</td>
</tr>
<tr>
<td>2</td>
<td>1-10V</td>
</tr>
</tbody>
</table>

### Connection

1  UN + 24 VDC
2  PWM/LIN
3  GND

### Fan / Motor

- Speed adjustable via potentiometer

---

<table>
<thead>
<tr>
<th>Connection</th>
<th>Designation</th>
<th>Assignment/function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UB +24 VDC</td>
<td>Power supply 24 VDC, maximum ripple 3.5 %</td>
</tr>
<tr>
<td>2</td>
<td>PWM/LIN</td>
<td>Analog voltage control input 0-10 V or PWM</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>Reference ground</td>
</tr>
</tbody>
</table>

---

**Technical details**

- **n max.** = PWM/LIN with +UB or 10 V respectively 100 %
- 2200 rpm = PWM/LIN with 5.5 V respectively 55 %
- 1700 rpm = PWM/LIN with 2.0 V respectively 20 %
- 0 rpm = PWM/LIN with GND or 0 V respectively 0 %

* With PWM control, the PWM level is defined with 10 V.
Connection diagram: P)  
26 VDC (R3G 280-RU26-81)

Technical features:
- Control input 0-10 VDC / PWM
- Lowering input
- INVLIN (inverse linear control input)
- Fault output (high-side switch max. 30 mA)
- Undervoltage detection
- Power limiter
- Reverse polarity and locked-rotor protection
- Soft start
- Thermal overload protection for electronics

Customer circuit:
- Full speed
- Adjustable speed
- Speed adjustable via PWM 10Hz-50kHz
- Lowering input speed
- Diagnostic output
- Nominal operation
- Output level low
- Rotor locked
- Output level high (U = UB - 2V)
- Collective fault signal possible

Connection:
- UB +26 VDC
- PWM/LIN
- ABSENK
- DU
- GND
- INVLIN
- Standby threshold
- Switch-on threshold
- Motor stopped
- Motor turning
- UB

Assignment/function:
- UB +26 VDC: Power supply 26 VDC
- GND: Power supply GND, reference ground
- PWM/LIN: Analog voltage control input 0-10 V or PWM
- INVLIN: Control input, inverse linear
- ABSENK: Lowering input
- DU: Diagnostic output

Connection:
- Designation | Color | Assignment/function
- UB +26 VDC | black | Power supply 26 VDC
- GND | brown | Power supply GND, reference ground
- PWM/LIN | yellow | Analog voltage control input 0-10 V or PWM
- INVLIN | orange | Control input, inverse linear
- ABSENK | blue | Lowering input
- DU | white | Diagnostic output
Technical features:
- Control input 0-10 VDC / PWM
- Tach output
- Reverse polarity and locked-rotor protection
- Soft start
- Motor current limitation
- Temperature derating

Connection diagram: N)
12/24 VDC (R1G 220/250)

Customer circuit
Full speed
1
2
Adjustable speed
1-10V
10V -> n=max
10V -> n=0
Safe start-up at Unom -30% from 4V Unom:
2
3
4
Setting of values with ebm temperature controller
Speed adjustable via PWM 1-10kHz
12V
10K
1
2
3
4
100% PWM -> n=0
10% PWM -> n=0
<10% PWM -> n=0
Safe start-up at Unom -30% from 40% PWM
12V
12V
50003-1-0174
T<10°C -> n=0
T>45°C -> n=max
<1V -> n=min
<1V -> n=max
from 4V Ucontr.
10V -> n=max
10% PWM -> n=min
<10% PWM -> n=0
Safe start-up
at Unom -30%
from 40% PWM

Connection
Fan / Motor
UN +24VDC
PWM/lin
RE>100K
1
2
3
4
UB
DUE
680R
GND
47V
GND1
Reverse-polarity protection

<table>
<thead>
<tr>
<th>Connection</th>
<th>Designation</th>
<th>Color</th>
<th>Assignment/function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UN</td>
<td>red</td>
<td>Power supply 24 VDC; maximum ripple 3.5 %</td>
</tr>
<tr>
<td>2</td>
<td>PWM/lin</td>
<td>yellow</td>
<td>Control input Re &gt; 100 K</td>
</tr>
<tr>
<td>3</td>
<td>DUE</td>
<td>white</td>
<td>Tach output, 3 pulses per revolution, Isink max. = 10 mA</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
<td>blue</td>
<td>Reference ground</td>
</tr>
</tbody>
</table>
### Technical features:
- Control input 0-10 VDC / PWM
- Undervoltage detection
- Power limiter
- Soft start
- Thermal overload protection for electronics
- Motor current limitation
- Overvoltage detection
- Load dump (58 V)

### Connection diagram: Q)

#### 26 VDC (K3G 097-AS82-82)

![Connection diagram](image)

**Connection**
- UB +24VDC
- UB 0 VDC
- PWM/LIN
- DUE
- GND

**Fan / Motor**
- 1
- 2
- 3
- 4
- 5

**Customer circuit**
- Full speed
- Adjustable speed
- Speed adjustable via PWM 10Hz-50KHz
- Diagnostic output

**Designation**
- 1
- 2
- 3
- 5

**Color**
- black
- brown
- yellow
- white

**Assignment/function**
- Power supply 24 VDC, voltage range see nameplate
- Power supply GND, reference ground
- Analog voltage control input 0-10 V or PWM
- Fan OK: high, fan error: low, Isink max = 10 mA

**Technical features**
- Control input 0-10 VDC / PWM
- Undervoltage detection
- Power limiter
- Soft start
- Thermal overload protection for electronics
- Motor current limitation
- Overvoltage detection
- Load dump (58 V)
Technical features:
- Control input 0-10 VDC / PWM
- Fault output (low-side switch max. 30 mA)
- Undervoltage detection
- Temperature derating / power limiter
- Soft start / reverse polarity and locked-rotor protection
- Thermal overload protection for electronics
- Motor current limitation
- Overvoltage detection
- Load dump (58 V)

Customer circuit

- Speed setting
- Speed setting with potentiometer
- Full speed

Connection

- Designation
- Color
- Assignment/function

1. +UB  | black  | Power supply
2. DIAG | white  | Diagnostic output
        |        | - Operation: Output level low
        |        | - Rotor blocked or overvoltage/undervoltage
        |        | - Output level high
        |        | - Imax = 10 mA
3. PWM/LIN | yellow  | Analog voltage control input 0-10 V or PWM
4. GND | brown  | Power supply GND, reference ground

Motor current limitation
- Overvoltage detection
- Load dump (58 V)
Connection diagram: U)
13 VDC (W1G 300-EC12-20)

Technical features:
- Control input 0-10 VDC / PWM
- Locked-rotor protection
- Soft start
- Thermal overload protection for electronics
- Motor current limitation
- Temperature derating

### Connection Designation

<table>
<thead>
<tr>
<th>Connection</th>
<th>Designation</th>
<th>Assignment/function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>U1 +13 VDC</td>
<td>Power supply 13 VDC, maximum ripple 3.5 %</td>
</tr>
<tr>
<td>2</td>
<td>PWM/LIN</td>
<td>Analog voltage control input 0-10 V or PWM</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>Reference ground</td>
</tr>
</tbody>
</table>
High standards for all ebm-papst products
At ebm-papst we are always looking to improve our products to be able to offer customers just what they need for their particular requirements. Careful monitoring of the market enables us to constantly incorporate enhancements into our products. As shown by the technical parameters listed below, you can always be sure of finding the right solution from ebm-papst for whatever application you may have in mind.

General performance parameters
Any deviations from the technical data and technical parameters described here are given in the product-specific data sheet.

Degree of protection
The degree of protection is specified in the product-specific data sheets.

Insulation class
The insulation class is specified in the product-specific data sheets.

Installation position
The installation position is specified in the product-specific data sheets.

Condensation drainage holes
Information on condensation drainage holes is provided in the product-specific data sheets.

Mode of operation
The mode of operation is specified in the product-specific data sheets.

Protection class
The protection class is specified in the product-specific data sheets.

Service life
The service life of ebm-papst automotive products depends on:

- The service life of the bearing system

The service life of the bearing system is primarily governed by the thermal load on the bearings.

For the majority of our products we use maintenance-free ball bearings which can be installed in any installation position.

As a rough guide (depending on the general conditions), the ball bearings have a life expectancy \( L_{10} \) of approx. 40,000 hours of operation at an ambient temperature of 40 °C.

We will gladly provide you with a life expectancy calculation based on your specific usage conditions.

Motor protection/thermal protection
Information on motor protection and thermal protection is provided in the product-specific data sheets.

The following protection methods are provided depending on the type of motor and area of application:

- Thermal overload protector, in-circuit
- PTC/NTC with electronic diagnostics
- Current limitation via electronics
Mechanical strain/performance parameters

All ebm-papst products are subjected to comprehensive testing in conformity with the normative specifications and also incorporating the extensive experience of ebm-papst.

Vibration testing

Vibration testing is performed as follows:
- Vibration test in operation according to DIN IEC 68 Part 2-6
- Vibration test at standstill according to DIN IEC 68 Part 2-6

Shock load

Shock load testing is performed as follows:
- Shock load according to DIN IEC 68 Part 2-27

Balancing grade

Balancing grade testing is performed as follows:
- Residual imbalance according to DIN ISO 1940
- Standard balancing quality level G 6.3

Should your particular application require a higher level of balancing, please contact us and specify the details in your order.

Chemical and physical strain/performance parameters

Please consult your ebm-papst contact for any questions regarding chemical and physical strain.

Areas of use, industries & applications

Our products are used in a variety of industries and for numerous applications:
Ventilation, air conditioning and refrigeration technology, clean room technology, automotive and railway engineering, medical and laboratory technology, electronics, computer and office systems, telecommunications, household appliances, heating systems, machinery and installations, drive engineering.

Our products are not intended for use in the aerospace industry!

Legal and normative specifications

The products described in this catalog are developed and manufactured in accordance with the standards applying to the particular product and, if known, in accordance with the conditions of the particular area of application.

Standards

Information on standards is provided in the product-specific data sheets.

EMC

Information on EMC standards is provided in the product-specific data sheets.

Compliance with EMC standards has to be assessed on the final product, as EMC properties may change under different installation conditions.

Approvals

Please contact us if you require a specific Typee of approval (e1, UL, etc.) for your ebm-papst product.

Most of our products can be supplied with the applicable approval. Information on existing approvals is provided in the product-specific data sheets.

Air performance measurements

All air performance measurements are conducted on intake-side chamber test rigs conforming to the requirements of ISO 5801 and DIN 24163. The fans under test are attached to the measuring chamber with free air intake and exhaust (installation category A) and operated at nominal voltage, with alternating current also at nominal frequency, without any additional attachments such as a guard grille.

As required by the standards, the air performance curves shown are referenced to an air density of 1.15 kg/m³.
Technical parameters and scope

Air and sound measurement conditions
Measurements on ebm-papst products are taken under the following conditions:
- Axial and diagonal fans in airflow direction "V" in full nozzle without guard grille
- Backward-curved centrifugal fans, free-running with inlet ring
- Forward-curved single and dual-inlet centrifugal fans with housing

Sound measurements
All sound measurements are taken in anechoic rooms with reverberant floor. ebm-papst acoustic test chambers meet the requirements of accuracy class 1 as per DIN EN ISO 3745. For sound measurement, the fans being tested are positioned in a reverberant wall and operated at nominal voltage, with alternating current also at nominal frequency, without any additional attachments such as a guard grille.

Sound pressure and sound power level
All acoustic values are determined in accordance with ISO 13347, DIN 45635 and ISO 3744/3745 as per accuracy class 2 and given in A-rated form.
For measurement of the sound pressure level $L_p$ the microphone is located on the intake side of the fan being tested, generally at a distance of 1 m on the fan axis.
For measurement of the sound power level $L_w$ 10 microphones are distributed over an enveloping surface on the intake side of the fan being tested (see graphic). The measured sound power level can be roughly calculated from the sound pressure level by adding 7 dB.

Measurement set-up according to ISO 13347-3 and DIN 45635-38:
- 10 measuring points
- $d \geq D$
- $h = 1,5d \ldots 4,5d$
Measurement area $S = 6d^2 + 7d (h + 1,5d)$
Cumulative level of several sound sources with the same level

The addition of 2 sound sources with the same level produces a level increase of approx. 3 dB. The noise characteristics of several identical fans can be predicted on the basis of the sound values specified in the data sheet. This is shown in the adjacent graph.

Example: There are 8 axial fans A3G800 on a condenser. According to the data sheet, the sound pressure level of one fan is 75 dB(A). The level increase determined from the graph is 9 dB. This means that a total level of 84 dB(A) is to be expected for the installation.

Cumulative level of two sound sources with different levels

The noise characteristics of two different fans can be predicted on the basis of the sound values specified in the data sheet. This is shown in the adjacent graph.

Example: In a ventilation unit, there is one axial fan A3G800 with a sound pressure level of 75 dB(A) at the point of operation and one axial fan A3G710 with 71 dB(A). The difference in level is 4 dB. The level increase of approx. 1.5 dB can now be read off the graph. This means that a total level of 76.5 dB(A) is to be expected for the unit.

Distance laws

The sound power level is not governed by the distance from the noise source. By contrast, the sound pressure level decreases with increasing distance from the sound source. The adjacent graph shows the decrease in level under far field conditions. Far field conditions apply if there is a considerable distance between the microphone and the fan in relation to the fan diameter and the wavelength under consideration. On account of the complexity of the topic, literature should be consulted for more detailed information on far fields. The level in the far field decreases by 6 dB each time the distance is doubled. Different relationships apply in the near field of the fan and the level may decrease to a far lesser extent. The following example only applies to far field conditions and may vary considerably as a result of installation effects:

For an axial fan A3G300, a sound pressure level of 65 dB(A) was measured at a distance of 1 m. From the adjacent graph, this would yield a reduction of 26 dB at a distance of 20 m, i.e. a sound pressure level of 39 dB(A).
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