

Automotive brushless DC fans

Climate control for commercial vehicles

Version 10/2011



The engineer's choice

ebmpapst

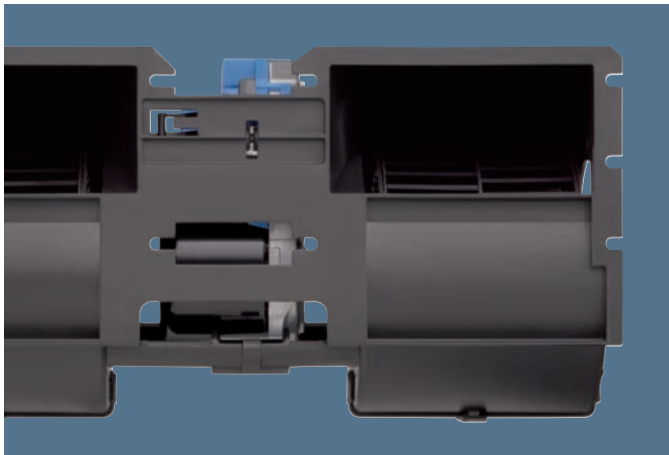
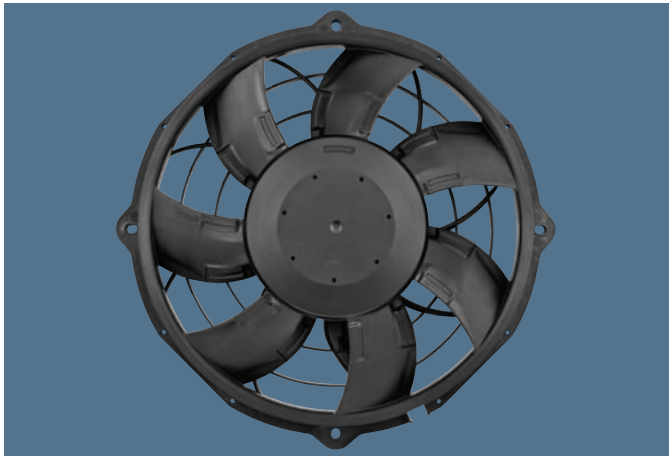
Automotive brushless DC fans

Our automotive brushless DC (BL-DC) axial fans and BL-DC dual centrifugal blowers set the trend in commercial vehicle climate control. They not only fulfil today's increased expectations for comfort, for example in buses, they also work without wear – because they are brushless – for over 40,000 hours. No extra maintenance, no additional service required. That is the reliability you expect from ebm-papst.

Advantages and characteristics in a glance

- Over 40,000 operating hours
- Continuous speed control
- High efficiency
- Low noise emission due to aerodynamically optimised impellers
- Increased reliability due to high integration density of the electronics
- Can be retrofitted to existing systems
- Meet the highest EMC requirements
- Control characteristic can be parameterised
- Optimised voltage independence
- Extended temperature range
- Durable ball bearings

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Sustainability is at the Centre of Our Thoughts and Actions. Out of Conviction!

Eco-friendliness and sustainability have always been at the core of our thoughts and actions. For decades, we have worked according to the simple but strict creed of our co-founder Gerhard Sturm: "Each new product we develop has to be better than the last one in terms of economy and ecology." GreenTech is the ultimate expression of our corporate philosophy.





GreenTech is pro-active development.

Even in the design phase, the materials and processes we use are optimised for the greatest possible eco-friendliness, energy balance and – wherever possible – recyclability. We continually improve the material and performance of our products, as well as the flow and noise characteristics. At the same time, we significantly reduce energy consumption. Close cooperation with universities and scientific institutes and the professorship we endow in the area of power engineering and regenerative energies allows us to profit from the latest research findings in these fields – and at the same time ensure highly qualified young academics.

GreenTech is ecofriendly production.

GreenTech also stands for maximum energy efficiency in our production processes. There, the intelligent use of industrial waste heat and ground-water cooling, photovoltaics and, of course, our own cooling and ventilation technology are of the utmost importance. Our most modern plant, for instance, consumes 91% less energy than currently specified and required. In this way, our products contribute to protecting the environment, from their origin to their recyclable packaging.

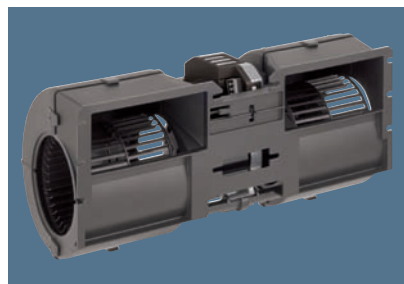
GreenTech is acknowledged and certified.

Every step in our chain of production meets the stringent standards of environmental specialists and the public. The 2008 Environmental Prize of Baden-Wuerttemberg, the Green Award 2009, the Energy Efficiency Award 2009 of the dena – to give just a few examples – testify to this. The environmental advantage gained in the performance of the products developed from our GreenTech philosophy can also be measured in the fulfilment of the most stringent energy and environmental standards. In many instances, our products are already well below the thresholds energy legislation will impose a few years from now – several times over.

Our customers profit from this every day.

The heart of GreenTech is future-oriented EC technology from ebm-papst. The EC technology at the core of our most efficient motors and fans allows efficiency of up to 90%, saves energy at a very high level, significantly extends service life and makes our products maintenance-free. These values pay off not only for the environment, but every cent also pays off for the user! All ebm-papst products – even those for which GreenTech EC technology does not (yet) make sense from an application viewpoint – feature the greatest possible connection of economy and ecology.

Ideas for technological change in commercial vehicles



*EC dual centrifugal blowers:
for maximum performance
with the smallest installa-
tion space; easy to control
and extremely quiet.*

A comfortable environment in commercial vehicles is by no means just a matter of amenities. Both passenger transportation in buses and coaches along with trucking that is as free of stress and fatigue as possible place high demands on vehicle technology, particularly climate control, ventilation and air-conditioning.

For many years, renowned bus manufacturers have installed air-conditioning systems with brushless and wear-free centrifugal blowers and axial fans from ebm-papst. These products have also come to be used widely for climate control and ventilation of driver's cabs in trucks, tractors and construction equipment as well as in transport refrigeration systems.

A wide variety of climate control system manufacturers rely the experience and excellent skills of ebm-papst in our core competencies of motor development, aerodynamics and electronics.





Fans and blowers:
for commercial vehicle climate control
and cooling of individual components..

Meeting high demands with new technology

In modern commercial vehicles, EC technology has now become the standard. Our new second-generation EC axial fans and EC dual centrifugal blowers set the trend in commercial vehicle climate control around the world. Our EC fans demonstrate their clear superiority even in hot climates and tropical regions, where they have also already proven their excellent performance.

But customers rely on ebm-papst products not only in the area of climate control. Increasingly, EC fans are also finding application in the cooling of heat exchangers in the engine compartment of vehicles.

In comparison:

In commutator motors from other manufacturers, the commutator performs the task of distributing current to the coils. The commutator consists of copper segments embedded in an insulating compound. Mechanical springs press the integrated carbon brushes onto the commutator. The friction between these two mechanical components is the weak point of conventional DC motors. After a running time of approximately 5,000 hours, the carbon brushes and the commutator are worn out. As a result, the entire blower needs to be replaced. Furthermore, open loop speed control is possible only with external electronics.



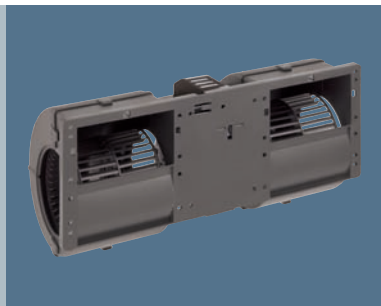
This is not true of brushless DC motors from ebm-papst. An electronic control integrated directly into these motors assumes the task of current distribution. No brushes means no parts to wear out. This increases the operating time of these motors to more than 40,000 hours. As a result, the user not only saves on spare parts and repair costs, but also avoids unproductive downtimes and potential damage to reputation.

EC motors are energy-efficient, since the integrated electronics use continuous closed loop speed control to draw from the vehicle electrical system only the energy actually required. In commercial vehicle applications, it is also important that fans withstand environmental influences which are constantly fluctuating. Standard products would provide less than satisfactory results in these situations. Therefore, ebm-papst automotive products also feature reliable protection against load dump, reverse polarity, shock and vibration as well as damage from moisture and dirt in a wide temperature range. This requires exceptional effort when selecting materials and testing the products. We use extreme tests, which we have designed together with market-leading OEMs, based on real-world conditions (such as salt spray fog, vibration and temperature change tests) to ensure the performance of the fans.

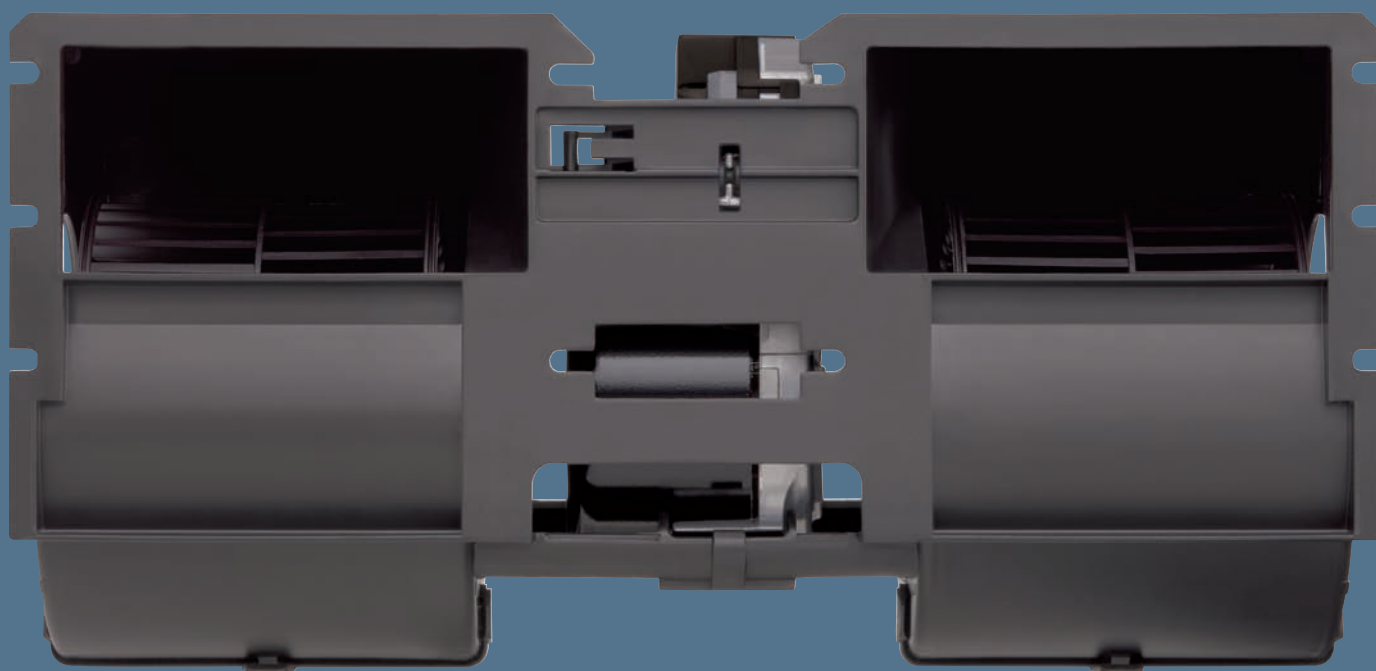
In addition to the significantly longer service life, our intelligent EC fans guarantee extended open and closed loop control options. The function of the fans can be determined at any time via a diagnostic output. Moreover, they have an excellent electromagnetic compatibility and operate extremely quietly.

But ebm-papst offers even more:

If you are ever unable to find a solution with our products, contact us. As a highly competent consultant and practically oriented implementer, we will certainly be able to identify a solution in your case using our in-depth knowledge gained from many applications.

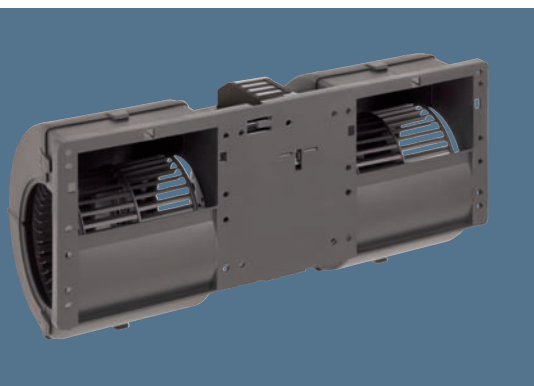


EC dual centrifugal blowers with brushless DC motor **“Premium”**



EC dual centrifugal blowers

with brushless DC motor, Ø 097

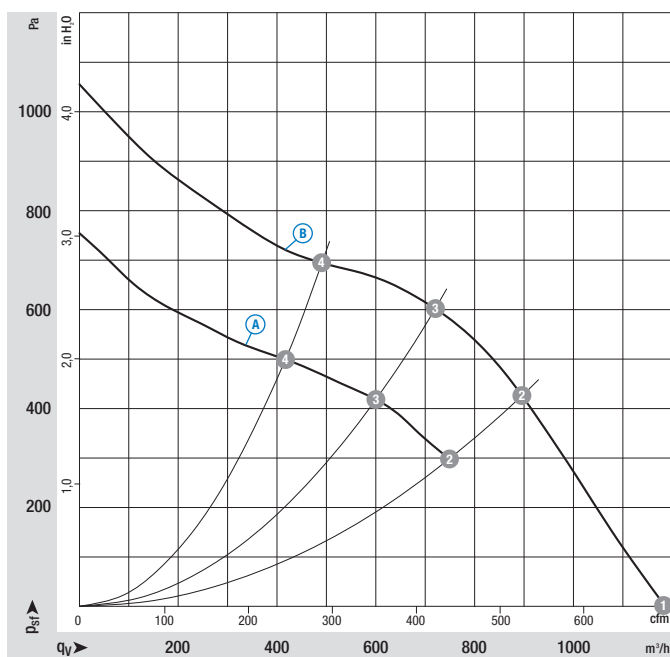


- **Material:** Housing: PP plastic, coloured black (conforms to UL 94 HB)
Impeller: PA plastic
- **Type of protection:** IP 24 KM (without plug)
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings on both sides
- **Motor protection:** Overtemperature protection, reverse polarity and locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** VDE 0879-2, interference suppression grade 5

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Min. back pressure | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|---------------------------------|-----------|-------|-----------------|-----------------------|-----------|-----------|-------------|--------------|--------------------|----------------------|-------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | Pa | dB(A) | °C | kg | |
| K3G 097-AK32 -42 ⁽¹⁾ | M3G074-CF | A | 13 | 9-15 | 750 | 3630 | 195 | 15,0 | 300 | 63 | -40..+85 ⁽²⁾ | 2,3 | A |
| K3G 097-AK36 -55 ⁽¹⁾ | M3G074-CF | B | 13 | 9-15 | 1180 | 3740 | 385 | 29,5 | 0 | 69 | -40..+85 ⁽²⁾ | 2,6 | A |

subject to alterations ⁽¹⁾ 12-volt variant ⁽²⁾ at free air not recommended for long-term operation at 85 °C

Curves



Air performance measured as per: ISO 5801, Installation category A, in ebm-papst scroll housing

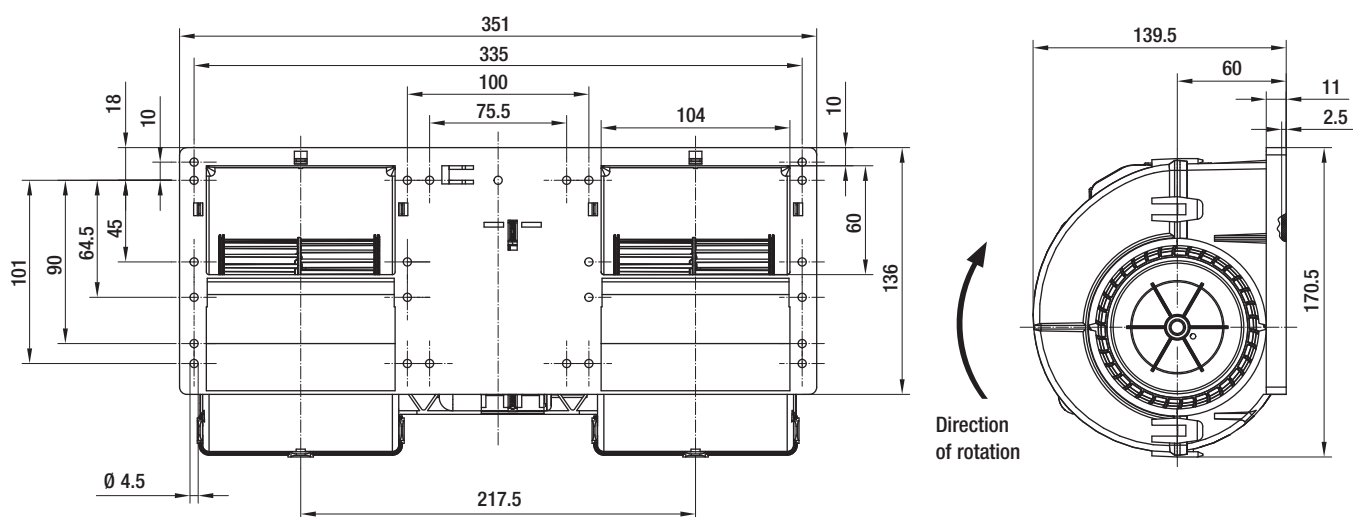
Suction-side noise levels: L_pA measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

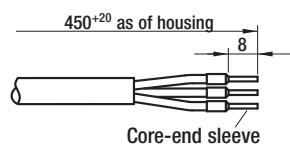
For detailed information see page 56 ff.

| | n rpm | P _e W | I A | L _{pA} dB(A) |
|-----|----------|---------------------|--------|--------------------------|
| A 1 | --- | --- | --- | --- |
| A 2 | 3630 | 195 | 15,0 | 63 |
| A 3 | 3875 | 177 | 13,5 | 64 |
| A 4 | 4135 | 143 | 11,0 | 65 |
| B 1 | 3740 | 385 | 29,5 | 69 |
| B 2 | 4400 | 344 | 26,4 | 68 |
| B 3 | 4775 | 309 | 23,8 | 69 |
| B 4 | 4970 | 234 | 18,0 | 70 |



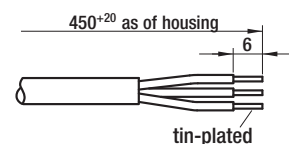
View lead connection (K3G097-AK32-42)

UN black
PWM/LIN yellow
GND brown



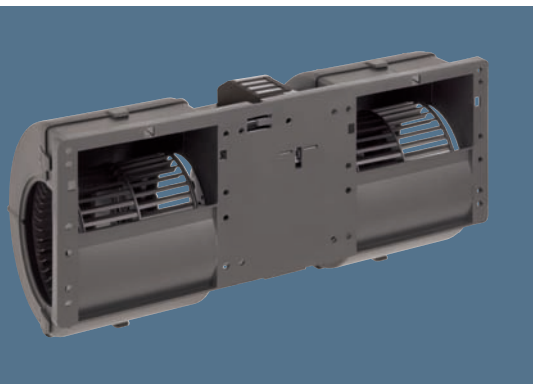
View lead connection (K3G097-AK36-55)

UN black
PWM/LIN yellow
GND brown



EC dual centrifugal blowers

with brushless DC motor, Ø 097

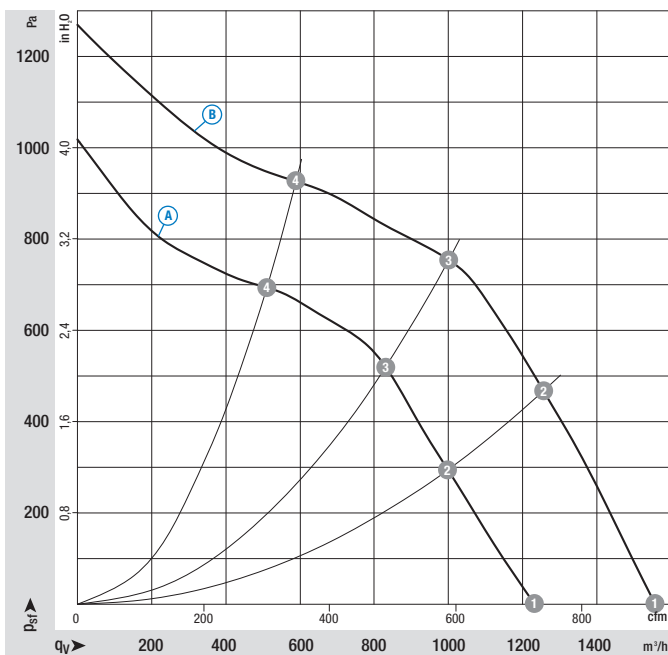


- **Material:** Housing: PP plastic, coloured black (conforms to UL 94 HB)
Impeller: PA plastic
- **Type of protection:** IP 24 KM (without plug)
- **Insulation class:** “B” in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings on both sides
- **Motor protection:** Overtemperature protection, reverse polarity and locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** Ⓐ VDE 0879-2, interference suppression grade 5
Ⓑ VDE 0879-2, interference suppression grade 3

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|------------------------------------|-----------|-------|-----------------|-----------------------|-----------|-----------|-------------|--------------|----------------------|-------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | |
| K3G 097-AK34 -43 ⁽¹⁾⁽³⁾ | M3G074-CF | Ⓐ | 26 | 16-32 | 1230 | 3730 | 370 | 14,2 | 69 | -40..+85 ⁽²⁾ | 2,3 | B |
| K3G 097-AK68 -85 ⁽¹⁾⁽³⁾ | M3G074-CF | Ⓑ | 26 | 16-32 | 1560 | 4600 | 690 | 26,5 | 75 | -40..+60 ⁽⁴⁾ | 2,4 | G |

subject to alterations ⁽¹⁾ 24-volt variant ⁽²⁾ at free air not recommended for long-term operation at 85 °C ⁽³⁾ housing/impeller also available in V0 material ⁽⁴⁾ short-term operation at up to 85 °C possible

Curves



Air performance measured as per: ISO 5801, Installation category A, in ebm-papst scroll housing

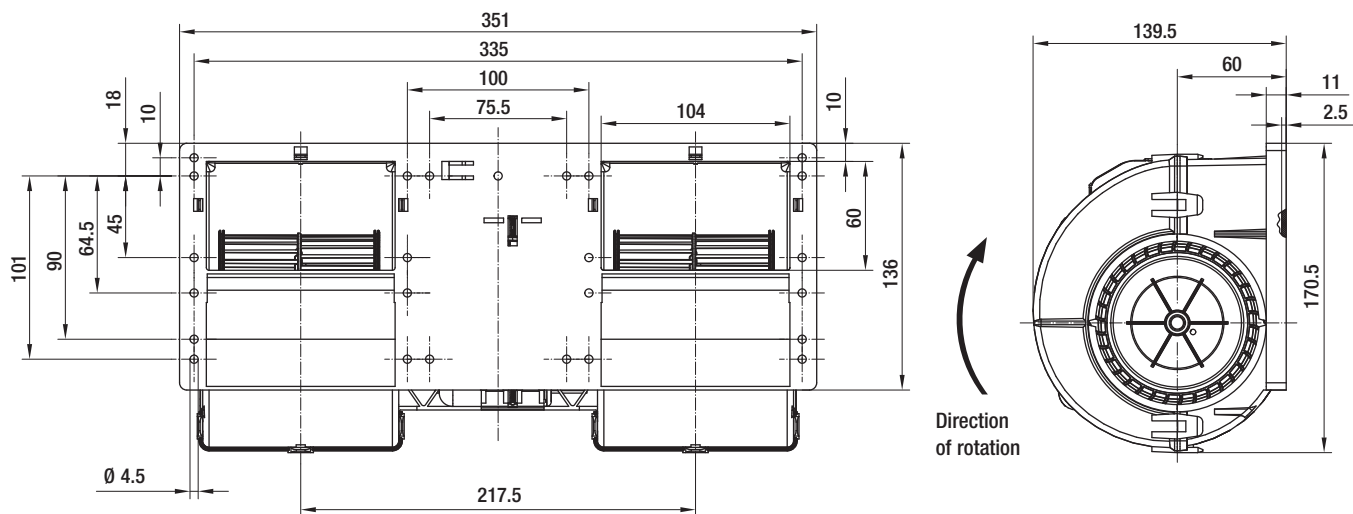
Suction-side noise levels: L_pA measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and re-viewed once installed or fitted!

For detailed information see page 56 ff.

| | n rpm | P _e W | I A | L _{pA} dB(A) |
|-----|----------|---------------------|--------|--------------------------|
| Ⓐ 1 | 3730 | 370 | 14,2 | 69 |
| Ⓐ 2 | 4105 | 324 | 12,4 | 68 |
| Ⓐ 3 | 4540 | 315 | 12,1 | 69 |
| Ⓐ 4 | 4935 | 231 | 8,9 | 70 |
| Ⓑ 1 | 4600 | 690 | 26,5 | 75 |
| Ⓑ 2 | 5095 | 604 | 23,2 | 74 |
| Ⓑ 3 | 5435 | 526 | 20,2 | 74 |
| Ⓑ 4 | 5720 | 365 | 14,0 | 74 |

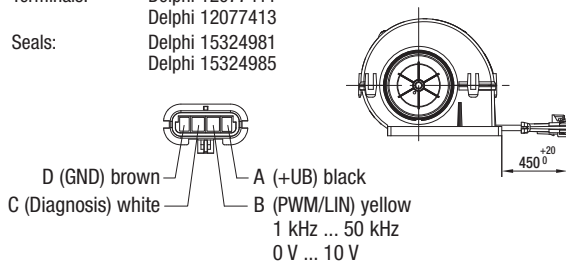


View connector plug (K3G097-AK68-85)

4-pole lead connection (450 mm) with plug Delphi Metri-Pack 280

Socket on customer side:

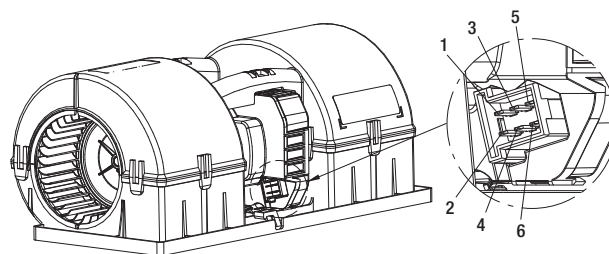
Housing: Delphi 12129565
 Secondary Lock: Delphi 15300016 (TPA lock)
 Terminals: Delphi 12077411
 Delphi 12077413
 Seals: Delphi 15324981
 Delphi 15324985



View connector plug (K3G097-AK34-43)

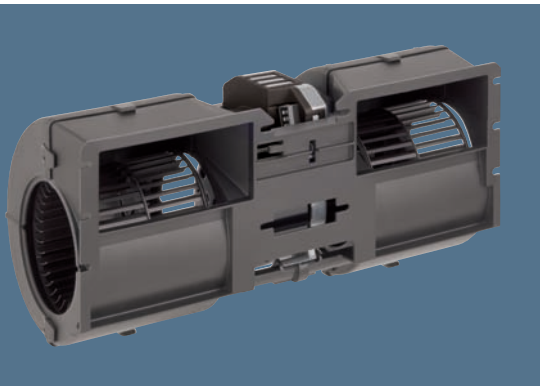
- 1 = UN black
- 2 = GND brown
- 3 = PWM/LIN yellow
- 4 = INVLIN orange
- 5 = LOWER blue
- 6 = Diagnostic output white

AMP Junior Power Timer, 6-pole, coded; connecting lead (460 mm) with mating plug; part no. 02001-4-1021 (not included in delivery)



EC dual centrifugal blowers

with brushless DC motor, Ø 97

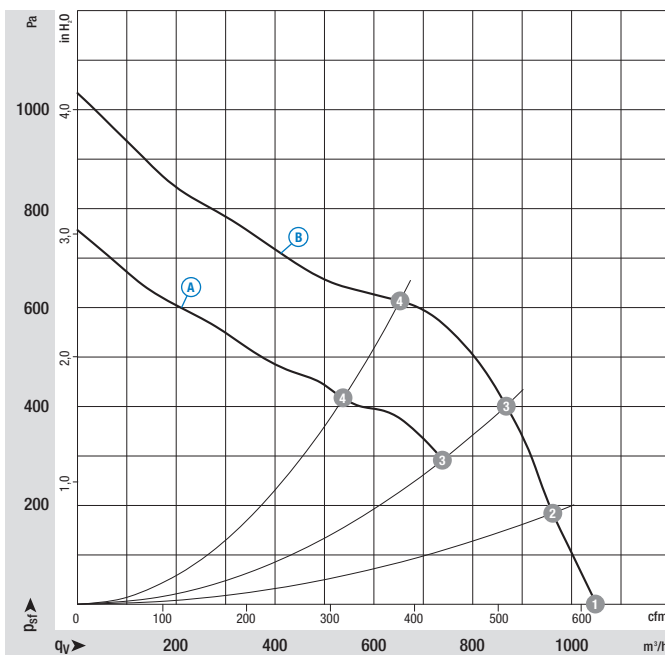


- **Material:** Housing: PP plastic, coloured black (conforms to UL 94 HB)
Impeller: PA plastic
- **Type of protection:** IP 24 KM (without plug)
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings on both sides
- **Motor protection:** Overtemperature protection, reverse polarity and locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** VDE 0879-2, interference suppression grade 5

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Min. back pressure | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|---------------------------------|-----------|-------|-----------------|-----------------------|-----------|-----------|-------------|--------------|--------------------|----------------------|-------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | Pa | dB(A) | °C | kg | |
| K3G 097-BK32 -42 ⁽¹⁾ | M3G074-CF | A | 13 | 9-15 | 740 | 3650 | 195 | 15,0 | 300 | 64 | -40..+85 ⁽²⁾ | 2,3 | A |
| K3G 097-BK36 -56 ⁽¹⁾ | M3G074-CF | B | 13 | 9-15 | 1050 | 3950 | 358 | 27,4 | 0 | 69 | -40..+85 ⁽²⁾ | 2,6 | A |

subject to alterations ⁽¹⁾ 12-volt variant ⁽²⁾ at free air not recommended for long-term operation at 85 °C

Curves



Air performance measured as per: ISO 5801, Installation category A, in ebm-papst scroll housing

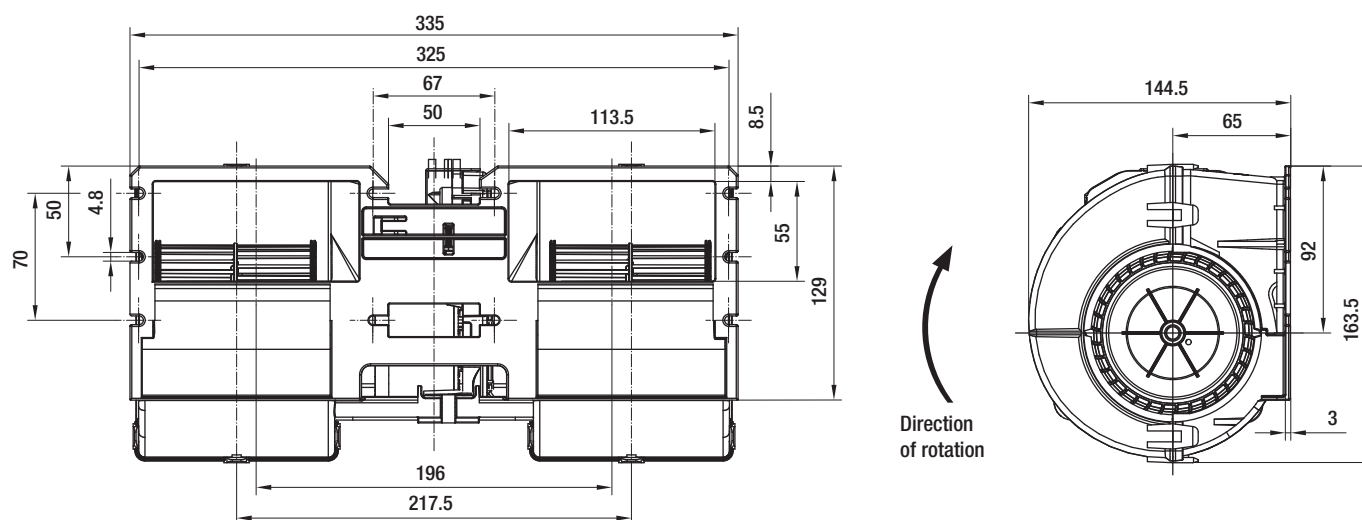
Suction-side noise levels: L_pA measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and re-viewed once installed or fitted!

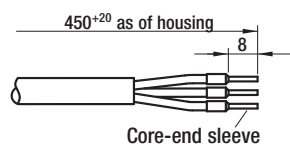
For detailed information see page 56 ff.

| | n rpm | P _e W | I A | L _{pA} dB(A) |
|-----|----------|---------------------|--------|--------------------------|
| A 1 | --- | --- | --- | --- |
| A 2 | --- | --- | --- | --- |
| A 3 | 3650 | 195 | 15,0 | 64 |
| A 4 | 3905 | 165 | 12,7 | 63 |
| B 1 | 3950 | 358 | 27,4 | 69 |
| B 2 | 4180 | 352 | 27,0 | 69 |
| B 3 | 4390 | 343 | 26,3 | 68 |
| B 4 | 4810 | 298 | 22,8 | 68 |



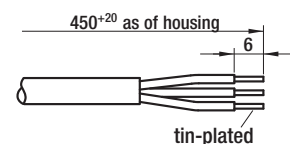
View lead connection (K3G097-BK32-42)

UN black
PWM/LIN yellow
GND brown



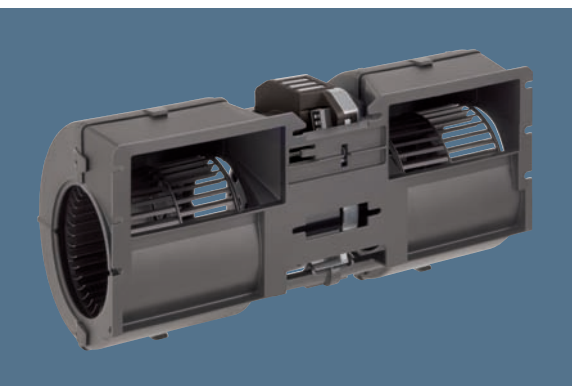
View lead connection (K3G097-BK36-56)

UN black
PWM/LIN yellow
GND brown



EC dual centrifugal blowers

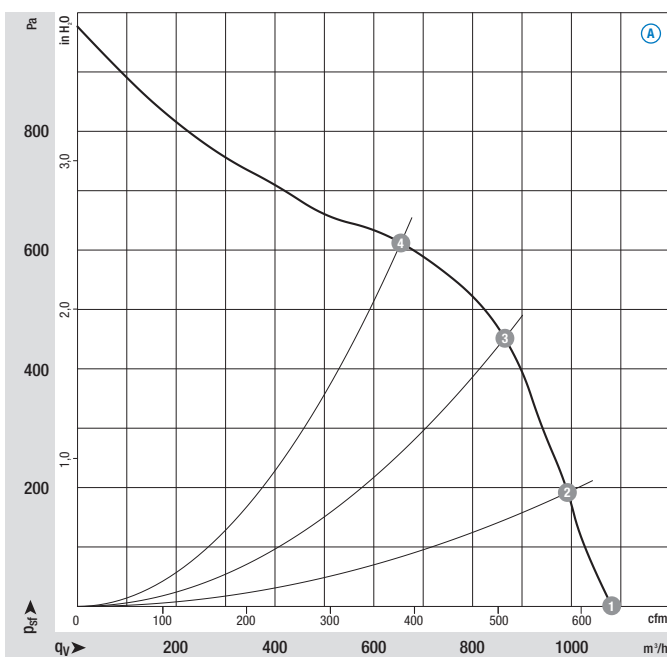
with brushless DC motor, Ø 097



- **Material:** Housing: PP plastic, coloured black (conforms to UL 94 HB)
Impeller: PA plastic
- **Type of protection:** IP 24 KM (without plug)
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings on both sides
- **Motor protection:** Overtemperature protection, reverse polarity and locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** VDE 0879-2, interference suppression grade 5

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|---------------------------------|-----------|--------------------------------|-----------------|---|-----------|-----------|-------------|--------------|----------------------|-------------------------|------|--------------------|
| Type | Motor | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | | |
| K3G 097-BK34 -43 ⁽¹⁾ | M3G074-CF | Ⓐ | 26 | 16-32 | 1080 | 3940 | 345 | 13,25 | 69 | -40..+85 ⁽²⁾ | 2,3 | B |
| subject to alterations | | ⁽¹⁾ 24-volt variant | | ⁽²⁾ at free air not recommended for long-term operation at 85 °C | | | | | | | | |

Curves



Air performance measured as per: ISO 5801, Installation category A, in ebm-papst scroll housing

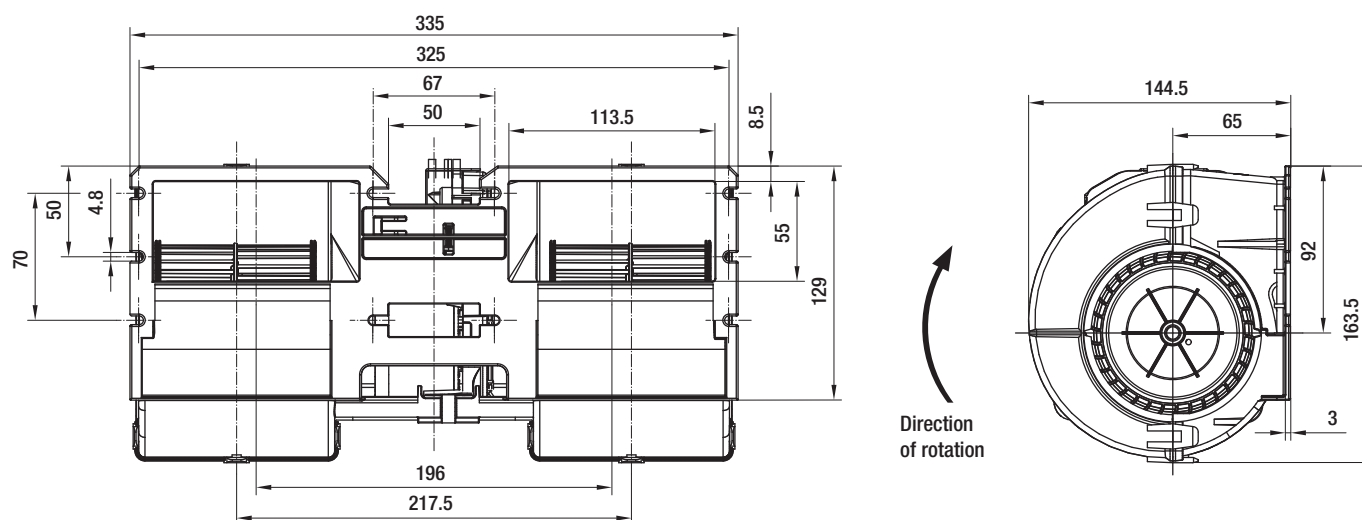
Suction-side noise levels:
L_{pA} measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 56 ff.

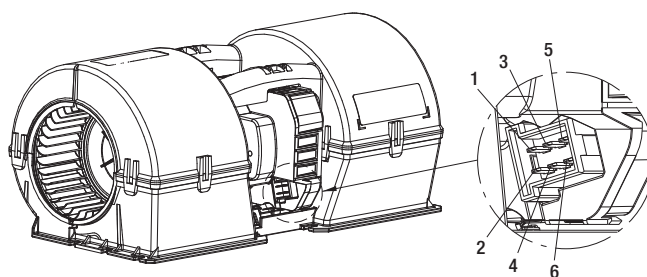
| | n rpm | P _e W | I A | L _{pA} dB(A) |
|-----|----------|---------------------|--------|--------------------------|
| Ⓐ 1 | 3940 | 345 | 13,25 | 69 |
| Ⓐ 2 | 4100 | 329 | 12,0 | 68 |
| Ⓐ 3 | 4460 | 322 | 11,8 | 67 |
| Ⓐ 4 | 4800 | 277 | 10,3 | 68 |

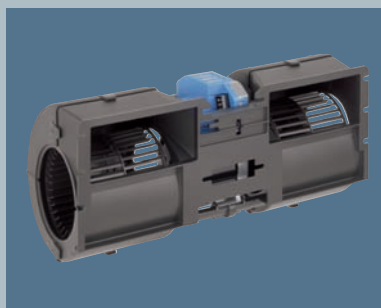


View connector plug

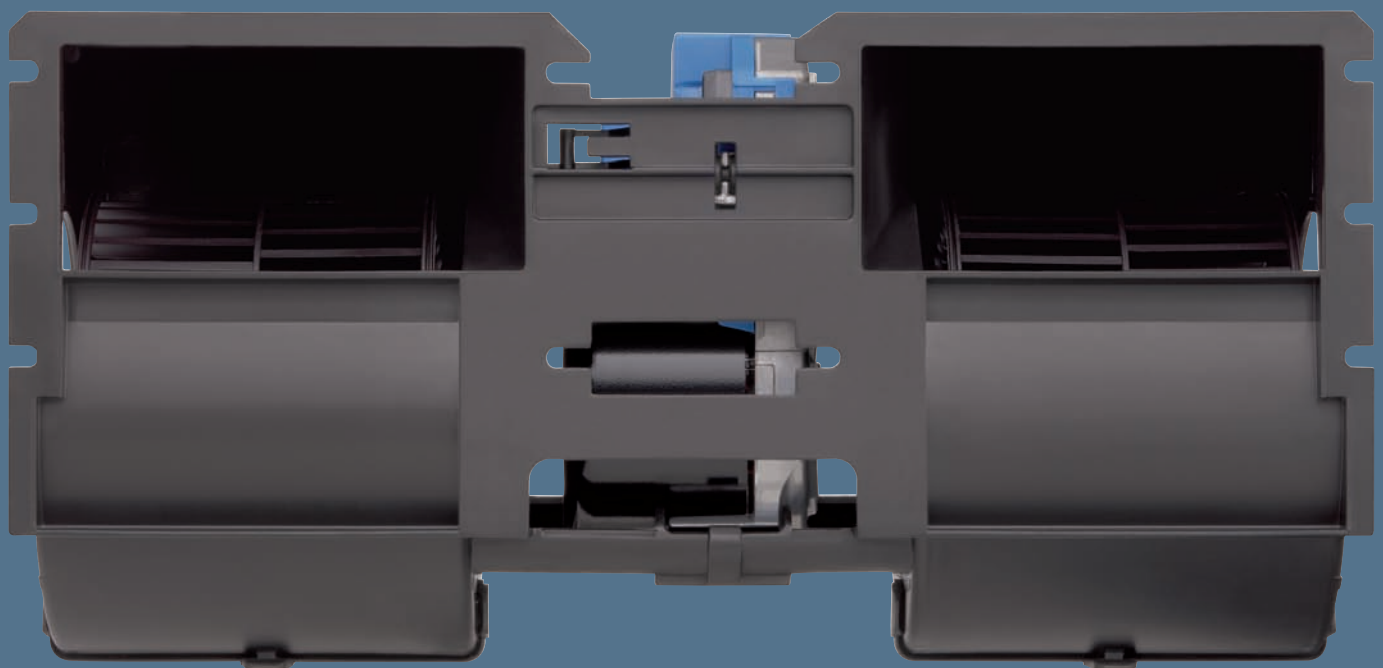
- | | |
|-----------------------|--------|
| 1 = UN | black |
| 2 = GND | brown |
| 3 = PWM/LIN | yellow |
| 4 = INVLIN | orange |
| 5 = LOWER | blue |
| 6 = Diagnostic output | white |

AMP Junior Power Timer, 6-pole, coded; connecting lead (460 mm) with mating plug; part no. 02001-4-1021 (not included in delivery)





EC dual centrifugal blowers with brushless DC motor „Basic“



EC dual centrifugal blowers

with brushless DC motor, Ø 097

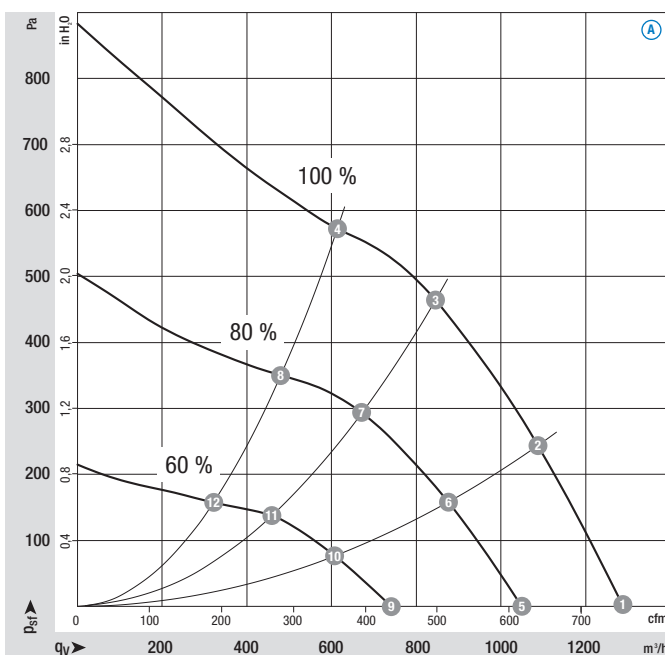


- **Material:** Housing: PP plastic, coloured black (conforms to UL 94 HB)
Impeller: PA plastic
- **Type of protection:** IP 24 KM (without plug)
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings on both sides
- **Motor protection:** Overtemperature protection, locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** e1 approval in accordance with 2006/28/EC

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|---------------------------------------|-----------|-------|-----------------|-----------------------|-----------|-----------|-------------|--------------|----------------------|-------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | |
| K3G 097-AK34 -65⁽¹⁾ | M3G074-CF | Ⓐ | 26 | 16-32 | 1290 | 3830 | 394 | 15,2 | 72 | -40..+85 ⁽²⁾ | 2,0 | F |

subject to alterations ⁽¹⁾ 24-volt variant ⁽²⁾ at free air not recommended for long-term operation at 85 °C

Curves



Air performance measured as per: ISO 5801, Installation category A, in ebm-papst scroll housing

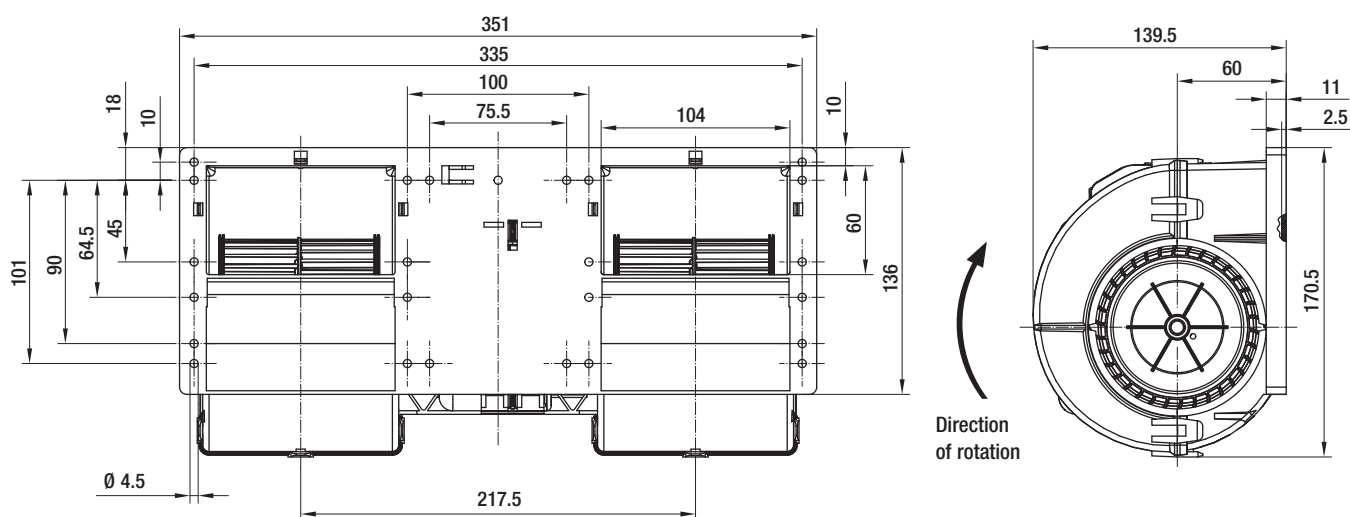
Suction-side noise levels: L_pA measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 56 ff.

| | n rpm | P _e W | I A | L _{pA} dB(A) |
|------|----------|---------------------|--------|--------------------------|
| Ⓐ 1 | 3830 | 394 | 15,2 | 72 |
| Ⓐ 2 | 4100 | 347 | 13,3 | 69 |
| Ⓐ 3 | 4380 | 285 | 10,9 | 68 |
| Ⓐ 4 | 4630 | 238 | 9,1 | 68 |
| Ⓐ 5 | 3150 | 215 | 8,3 | 68 |
| Ⓐ 6 | 3330 | 185 | 7,1 | 65 |
| Ⓐ 7 | 3510 | 149 | 5,7 | 63 |
| Ⓐ 8 | 3660 | 120 | 4,6 | 62 |
| Ⓐ 9 | 2240 | 79 | 3,1 | 59 |
| Ⓐ 10 | 2340 | 67 | 2,6 | 56 |
| Ⓐ 11 | 2430 | 53 | 2,0 | 54 |
| Ⓐ 12 | 4480 | 43 | 1,7 | 53 |



Speed setting

| Pin | 5 | 4 | 3 |
|------|----|----|----|
| 60% | H | NC | NC |
| 80% | NC | H | NC |
| 100% | NC | NC | H |

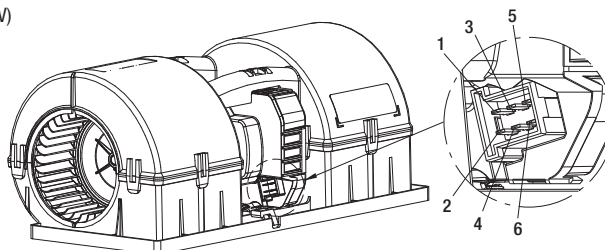
NC = not assigned

H = U_N (26 V)

View connector plug

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

AMP Junior Power Timer, 6-pole, coded; connecting lead (460 mm) with mating plug; part no. 02001-4-1021 (not included in delivery)



EC dual centrifugal blowers

with brushless DC motor, Ø 97

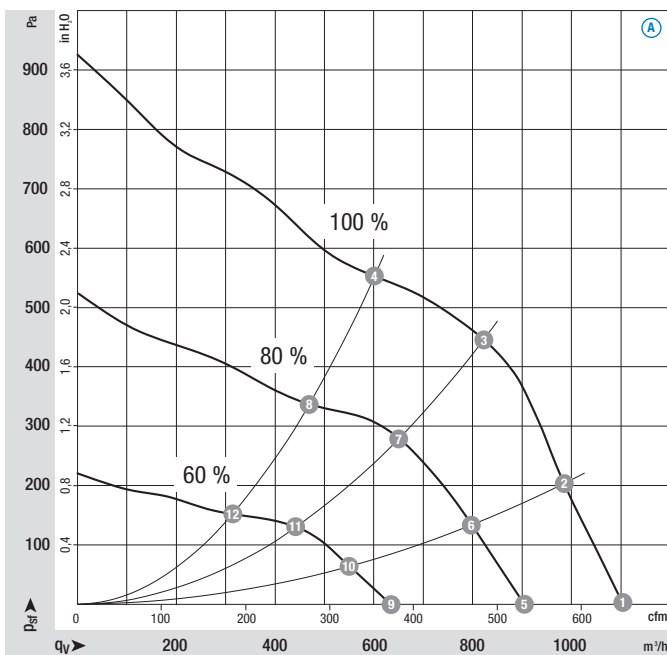


- **Material:** Housing: PP plastic, coloured black (conforms to UL 94 HB)
Impeller: PA plastic
- **Type of protection:** IP 24 KM (without plug)
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings on both sides
- **Motor protection:** Overtemperature protection, locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** e1 approval in accordance with 2006/28/EC

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|---------------------------------------|-----------|-------|-----------------|-----------------------|-----------|-----------|-------------|--------------|----------------------|-------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | |
| K3G 097-BK34 -65⁽¹⁾ | M3G074-CF | Ⓐ | 26 | 16-32 | 1110 | 4040 | 344 | 13,3 | 70 | -40..+85 ⁽²⁾ | 2,0 | F |

subject to alterations ⁽¹⁾ 24-volt variant ⁽²⁾ at free air not recommended for long-term operation at 85 °C

Curves



Air performance measured as per: ISO 5801, Installation category A, in ebm-papst scroll housing

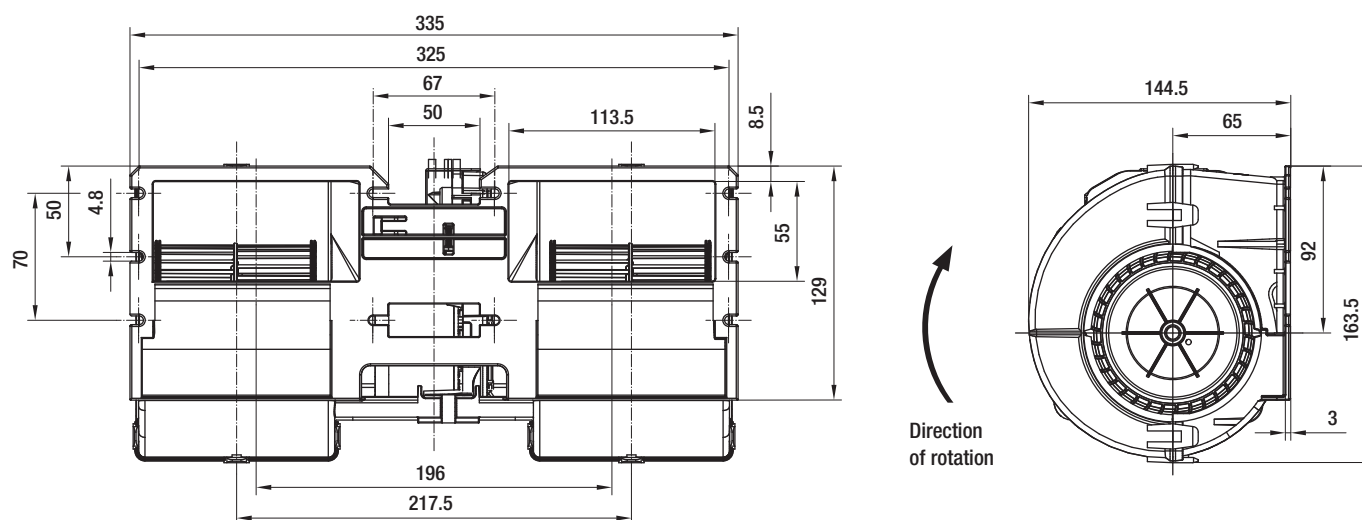
Suction-side noise levels: LpA measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 56 ff.

| | n rpm | Pe W | I A | LpA dB(A) |
|------|----------|---------|--------|--------------|
| Ⓐ 1 | 4040 | 344 | 13,3 | 70 |
| Ⓐ 2 | 4210 | 325 | 12,5 | 69 |
| Ⓐ 3 | 4380 | 279 | 10,6 | 68 |
| Ⓐ 4 | 4630 | 242 | 9,2 | 68 |
| Ⓐ 5 | 3310 | 186 | 7,2 | 66 |
| Ⓐ 6 | 3390 | 171 | 6,6 | 64 |
| Ⓐ 7 | 3520 | 145 | 5,5 | 63 |
| Ⓐ 8 | 3650 | 121 | 4,6 | 62 |
| Ⓐ 9 | 2330 | 67 | 2,6 | 57 |
| Ⓐ 10 | 2360 | 62 | 2,4 | 55 |
| Ⓐ 11 | 2410 | 53 | 2,0 | 54 |
| Ⓐ 12 | 2480 | 42 | 1,6 | 53 |



Speed setting

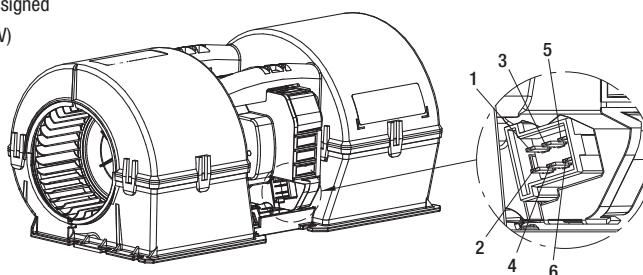
| Pin | 5 | 4 | 3 |
|------|----|----|----|
| 60% | H | NC | NC |
| 80% | NC | H | NC |
| 100% | NC | NC | H |

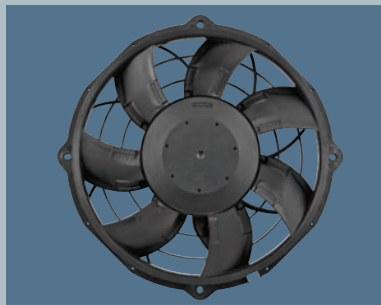
NC = not assigned
H = Un (26 V)

View connector plug

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

AMP Junior Power Timer, 6-pole, coded; connecting lead (460 mm) with mating plug; part no. 02001-4-1021 (not included in delivery)





EC axial fans with brushless DC motor „Premium“ and „Power“



EC axial fans

with brushless DC motor, Ø 280

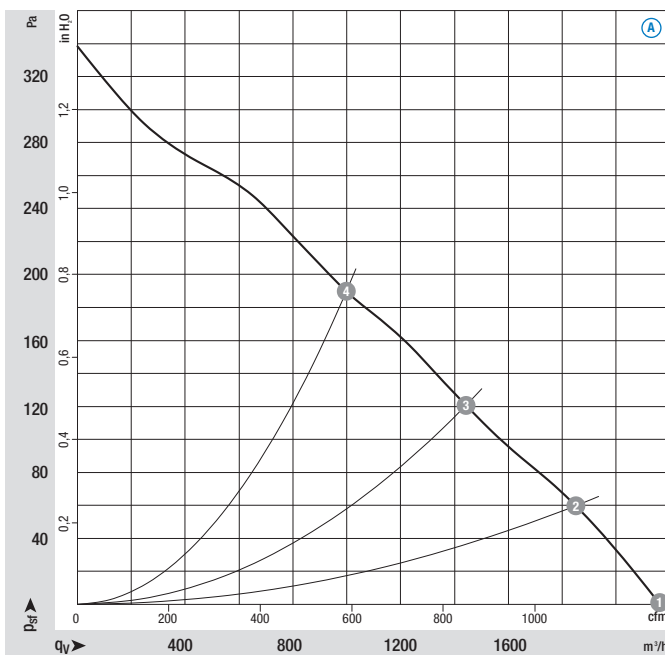


- **Material:** Wall ring: PP plastic, coloured black
Impeller: PBT plastic, coloured black (conforms to UL 94 HB)
- **Direction of rotation:** Clockwise, seen on rotor
- **Direction of air flow:** "V", exhaust over struts
- **Type of protection:** IP 24 KM
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings
- **Motor protection:** Overtemperature protection, reverse polarity and locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** VDE 0879-2, interference suppression grade 5

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|--------------------------------|-----------|-------|-----------------|-----------------------|-----------|-----------|-------------|--------------|----------------------|-------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | |
| W3G280-EQ08 -44 ⁽¹⁾ | M3G074-CF | Ⓐ | 13 | 9-15 | 2165 | 2830 | 152 | 11,7 | 68 | -40..+85 ⁽²⁾ | 2,4 | D |

subject to alterations ⁽¹⁾ 12-volt variant ⁽²⁾ at free air not recommended for long-term operation at 85 °C

Curves



Air performance measured as per: ISO 5801, Installation category A, without protection against accidental contact

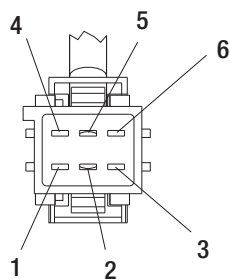
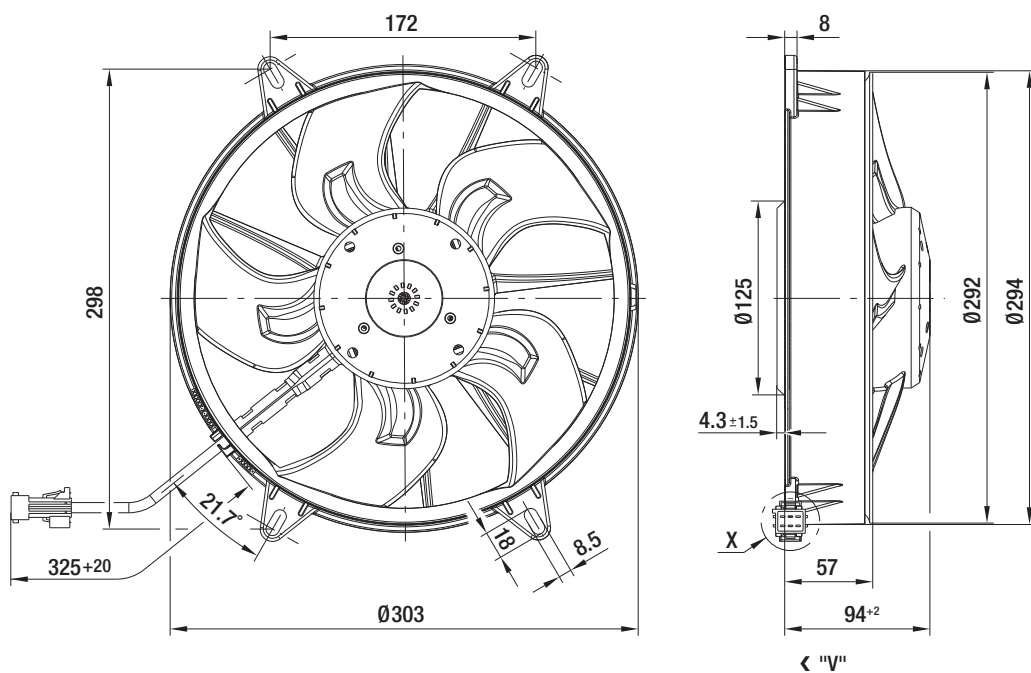
Suction-side noise levels:
L_{pA} measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 56 ff.

| | n rpm | P _e W | I A | L _{pA} dB(A) |
|-----|----------|---------------------|--------|--------------------------|
| Ⓐ ① | 2830 | 152 | 11,7 | 68 |
| Ⓐ ② | 2840 | 152 | 11,6 | 70 |
| Ⓐ ③ | 2845 | 150 | 11,5 | 72 |
| Ⓐ ④ | 2805 | 158 | 12,1 | 71 |



View X

- | | |
|-------------|----------------|
| 1 = UN | black |
| 2 = GND | brown |
| 3 = PWM/LIN | yellow |
| 4 = NC | (not assigned) |
| 5 = LOWER | blue |
| 6 = NC | (not assigned) |

AMP Junior Power Timer, 6-pole, coded;
connecting lead (460 mm) with mating plug;
part no. 02002-4-1021 (not included in delivery)

EC axial fans

with brushless DC motor, Ø 280

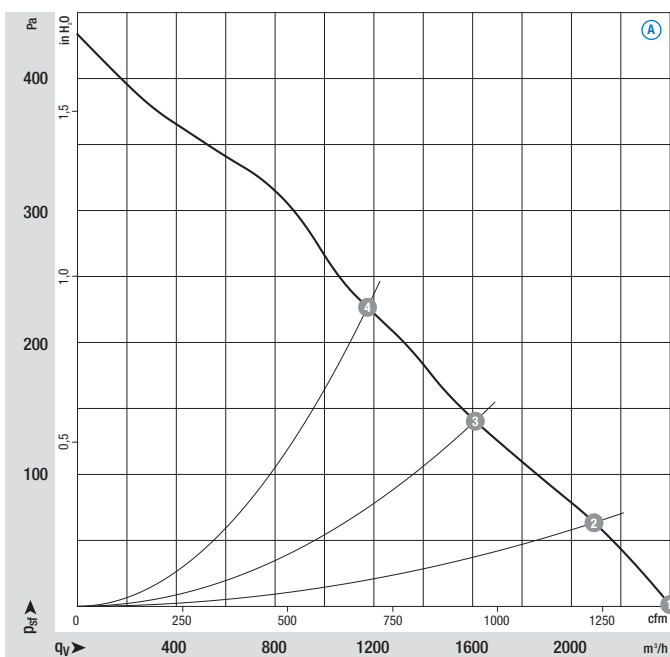


- **Material:** Wall ring: PP plastic, coloured black
Impeller: PBT plastic, coloured black (conforms to UL 94 HB)
- **Direction of rotation:** Clockwise, seen on rotor
- **Direction of air flow:** "V", exhaust over struts
- **Type of protection:** IP 24 KM
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings
- **Motor protection:** Overtemperature protection, reverse polarity and locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** VDE 0879-2, interference suppression grade 5

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|--------------------------------|-----------|-------|-----------------|-----------------------|-----------|-----------|-------------|--------------|----------------------|-------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | |
| W3G280-EQ20 -43 ⁽¹⁾ | M3G074-CF | Ⓐ | 26 | 16-32 | 2400 | 3100 | 200 | 7,5 | 72 | -40..+85 ⁽²⁾ | 2,4 | B |

subject to alterations ⁽¹⁾ 24-volt variant ⁽²⁾ at free air not recommended for long-term operation at 85 °C

Curves



Air performance measured as per: ISO 5801, Installation category A, without protection against accidental contact

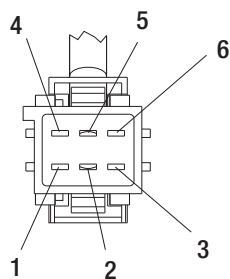
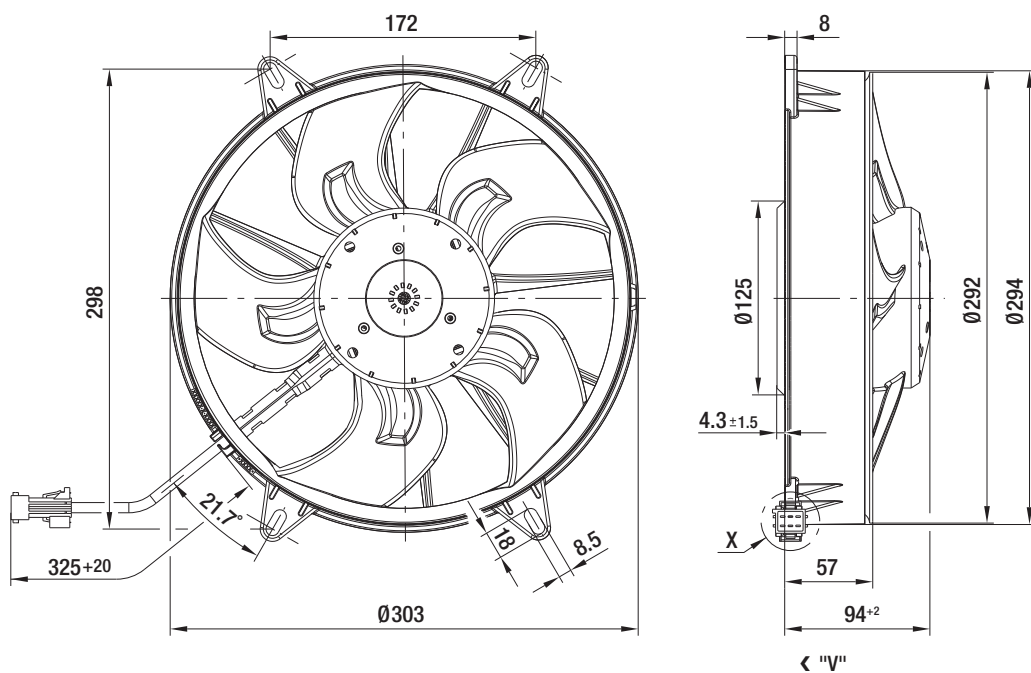
Suction-side noise levels:
L_{pA} measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 56 ff.

| | n rpm | P _e W | I A | L _{pA} dB(A) |
|-----|----------|---------------------|--------|--------------------------|
| Ⓐ 1 | 3100 | 200 | 7,5 | 72 |
| Ⓐ 2 | 3085 | 197 | 7,6 | 72 |
| Ⓐ 3 | 3090 | 192 | 7,3 | 74 |
| Ⓐ 4 | 3105 | 213 | 8,2 | 76 |



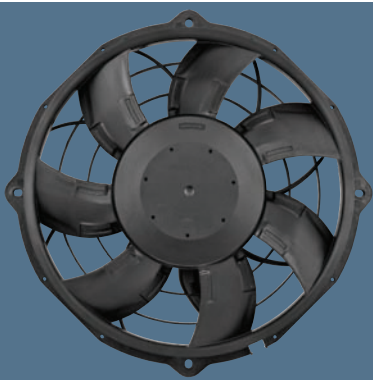
View X

- | | |
|-----------------------|--------|
| 1 = UN | black |
| 2 = GND | brown |
| 3 = PWM/LIN | yellow |
| 4 = INVLIN | orange |
| 5 = LOWER | blue |
| 6 = Diagnostic output | white |

AMP Junior Power Timer, 6-pole, coded;
connecting lead (460 mm) with mating plug;
part no. 02002-4-1021 (not included in delivery)

EC axial fans

with brushless DC motor, Ø 300

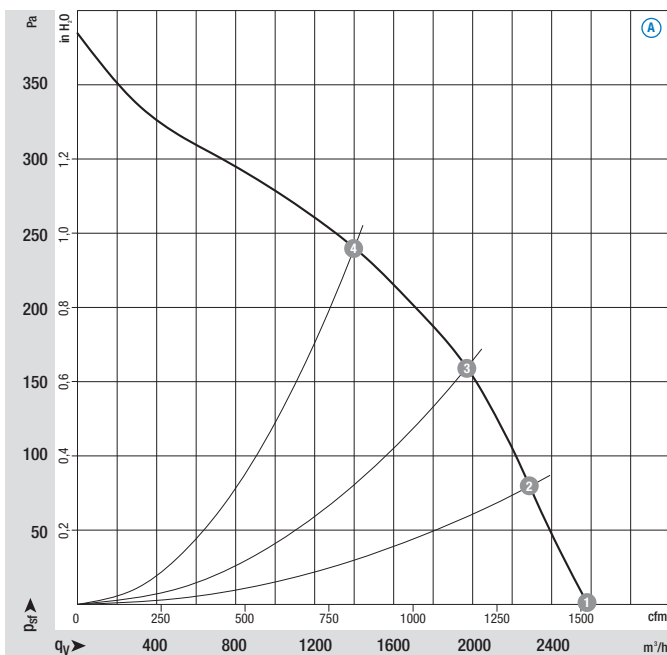


- **Material:** Wall ring: PA plastic, coloured black
Impeller: PA plastic, coloured black (conforms to UL 94 HB)
- **Direction of rotation:** Clockwise, seen on rotor
- **Direction of air flow:** "V", exhaust over struts
- **Type of protection:** Motor: IP 24 KM, Electronics: IP 66 / 69 K
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings
- **Motor protection:** Overtemperature protection, reverse polarity and locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** VDE 0879-2, interference suppression grade 5
- **Qualified to:** DIN ISO 16750

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|--------------------------------|-----------|-------|-----------------|-----------------------|-----------|-----------|-------------|--------------|----------------------|--------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | |
| W3G300-BV12 -41 ⁽¹⁾ | M3G084-BF | Ⓐ | 13 | 9-16 | 2580 | 3130 | 190 | 14,8 | 72 | -40..+105 ⁽²⁾ | 2,0 | K |

subject to alterations ⁽¹⁾ 12-volt variant ⁽²⁾ over + 90 °C with power derating

Curves



Air performance measured as per: ISO 5801, Installation category A, without protection against accidental contact

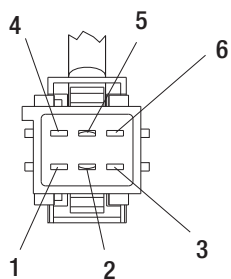
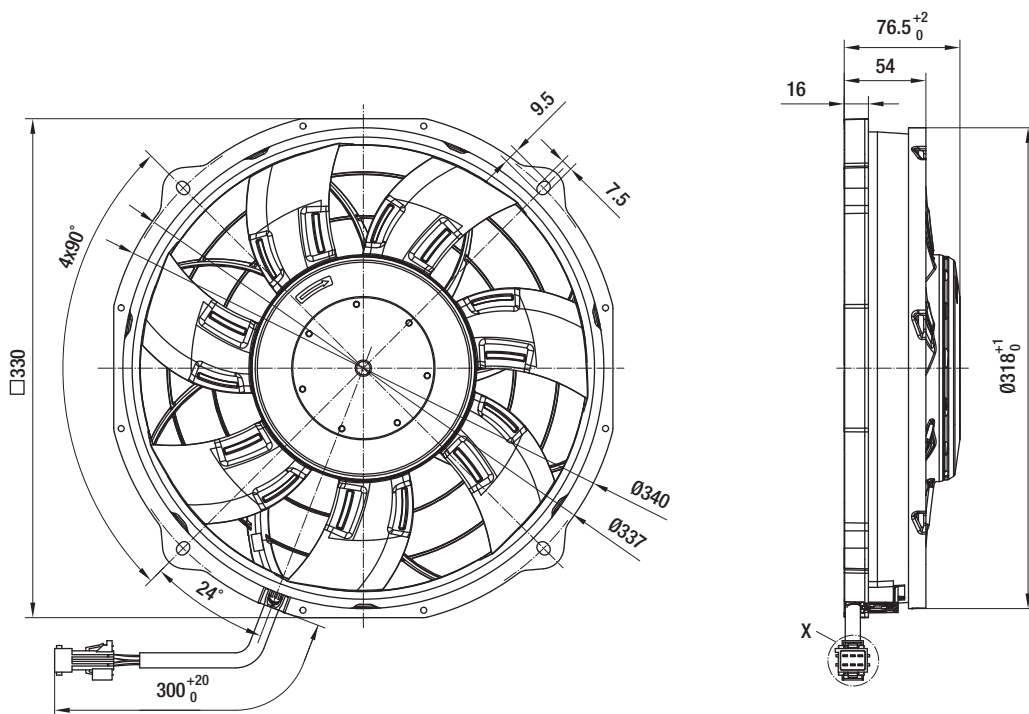
Suction-side noise levels:
 L_pA measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 56 ff.

| | n rpm | P_e W | I A | L_pA dB(A) |
|-----|----------|------------|--------|-----------------|
| Ⓐ 1 | 3130 | 190 | 14,8 | 72 |
| Ⓐ 2 | 3110 | 210 | 16,2 | 71 |
| Ⓐ 3 | 3010 | 224 | 17,3 | 69 |
| Ⓐ 4 | 2870 | 224 | 17,3 | 70 |



View X

1 = + UB black
 2 = GND brown
 3 = PWM/LIN* yellow
 4 = NC (not assigned)
 5 = LOWER blue
 6 = Diagnostic output white
 AMP Junior Power Timer, 6-pole, coded;
 connecting lead (460 mm) with mating plug;
 part no. 02002-4-1021 (not included in delivery)

* optionally LIN-BUS

◀ "V"

EC axial fans

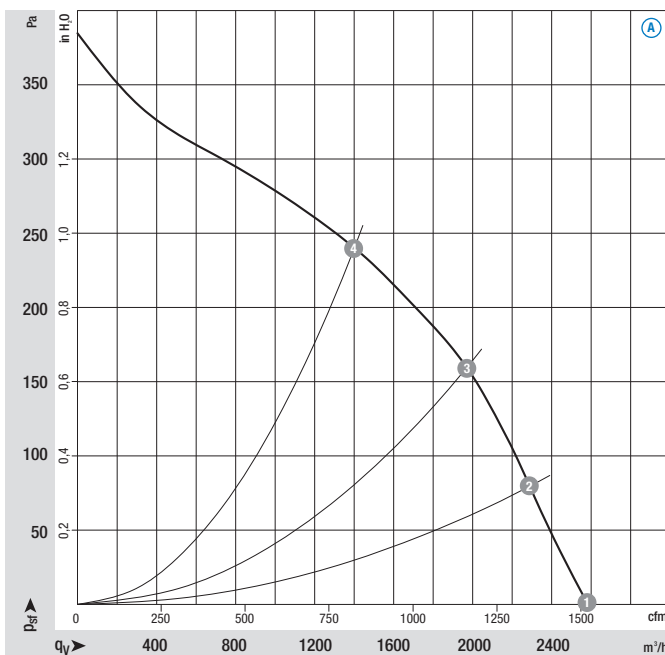
with brushless DC motor, Ø 300



- **Material:** Wall ring: PA plastic, coloured black
Impeller: PA plastic, coloured black (conforms to UL 94 HB)
- **Direction of rotation:** Clockwise, seen on rotor
- **Direction of air flow:** "V", exhaust over struts
- **Type of protection:** Motor: IP 24 KM, Electronics: IP 66 / 69 K
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings
- **Motor protection:** Overtemperature protection, reverse polarity and locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** VDE 0879-2, interference suppression grade 5
- **Qualified to:** DIN ISO 16750

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|--------------------------------|-----------|--------------------------------|-----------------|---|-----------|-----------|-------------|--------------|----------------------|--------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | |
| W3G300-BV24 -01 ⁽¹⁾ | M3G084-BF | Ⓐ | 26 | 16-32 | 2580 | 3130 | 190 | 7,42 | 72 | -40..+110 ⁽²⁾ | 2,0 | H |
| subject to alterations | | ⁽¹⁾ 24-volt variant | | ⁽²⁾ over + 95 °C with power derating | | | | | | | | |

Curves



Air performance measured as per: ISO 5801, Installation category A, without protection against accidental contact

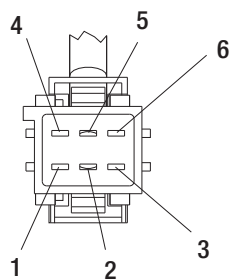
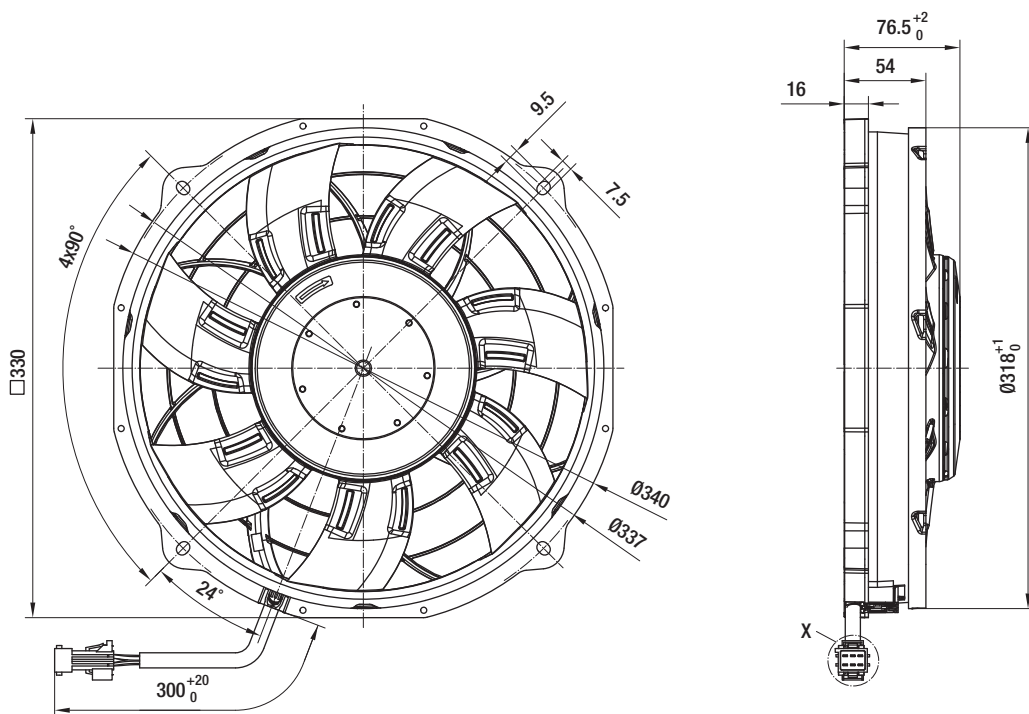
Suction-side noise levels:
L_{pA} measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 56 ff.

| | n rpm | P _e W | I A | L _{pA} dB(A) |
|-----|----------|---------------------|--------|--------------------------|
| Ⓐ 1 | 3130 | 190 | 7,42 | 72 |
| Ⓐ 2 | 3110 | 210 | 8,12 | 71 |
| Ⓐ 3 | 3010 | 224 | 8,64 | 69 |
| Ⓐ 4 | 2870 | 224 | 8,64 | 70 |



View X

- | | |
|-----------------------|--------|
| 1 = + UB | black |
| 2 = GND | brown |
| 3 = PWM/LIN* | yellow |
| 4 = INVLIN | orange |
| 5 = LOWER | blue |
| 6 = Diagnostic output | white |

AMP Junior Power Timer, 6-pole, coded;
connecting lead (460 mm) with mating plug;
part no. 02002-4-1021 (not included in delivery)

* optionally LIN-BUS

◀ "V"

EC axial fans

with brushless DC motor, Ø 300



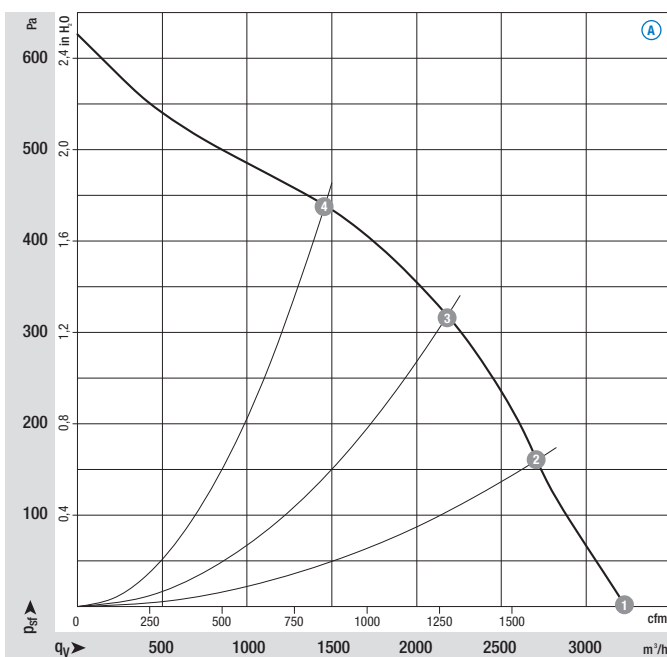
- **Material:** Wall ring: PA plastic, coloured black
Impeller: PA plastic, coloured black (conforms to UL 94 HB)
- **Direction of rotation:** Clockwise, seen on rotor
- **Direction of air flow:** "V", exhaust over struts
- **Type of protection:** Motor: IP 24 KM, Electronics: IP 66 / 69 K
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings
- **Motor protection:** Overtemperature protection, reverse polarity and locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** VDE 0879-2, interference suppression grade 5
- **Qualified to:** DIN ISO 16750

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|--------------------------------|-----------|-------|-----------------|-----------------------|-----------|-----------|-------------|--------------|----------------------|--------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | |
| W3G300-BV25 -21 ⁽¹⁾ | M3G084-BF | Ⓐ | 26 | 16-32 | 3230 | 3930 | 370 | 14,2 | 77 | -40..+110 ⁽²⁾ | 2,0 | H |

subject to alterations

⁽¹⁾ 24-volt variant ⁽²⁾ over + 85 °C with power derating

Curves



Air performance measured as per: ISO 5801, Installation category A, without protection against accidental contact

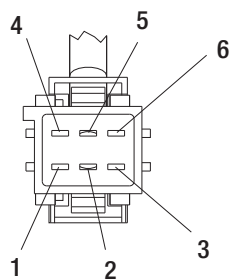
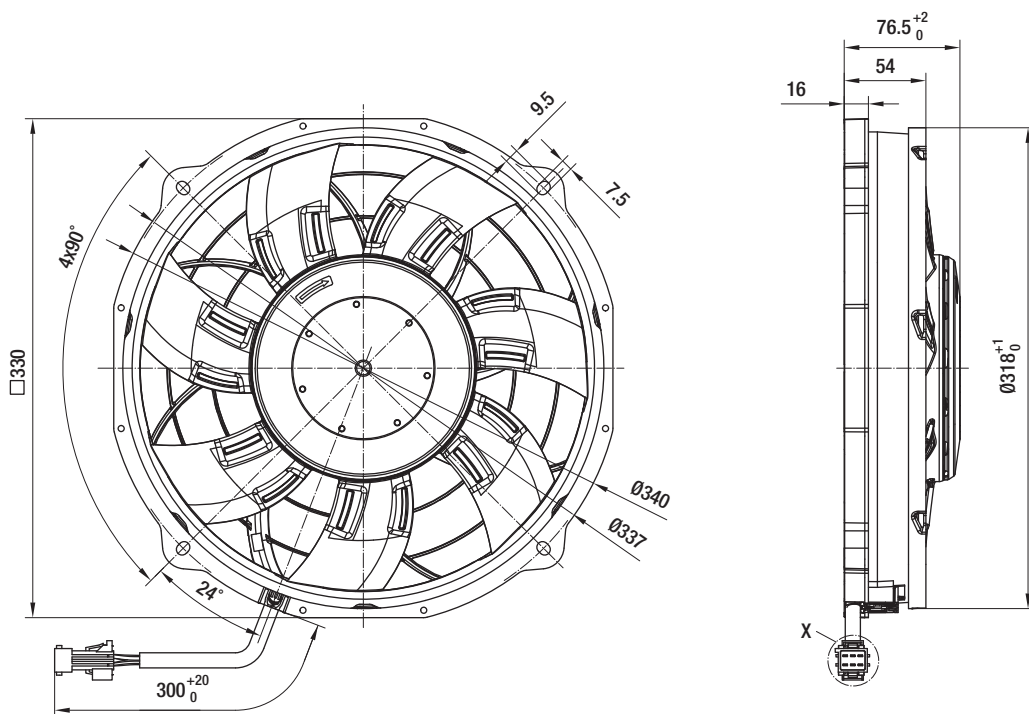
Suction-side noise levels:
LpA measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 56 ff.

| | n rpm | Pe W | I A | LpA dB(A) |
|-----|----------|---------|--------|--------------|
| Ⓐ 1 | 3930 | 370 | 14,2 | 77 |
| Ⓐ 2 | 3820 | 408 | 15,7 | 76 |
| Ⓐ 3 | 3715 | 465 | 17,9 | 75 |
| Ⓐ 4 | 3615 | 494 | 19,0 | 77 |



View X

- | | |
|-----------------------|--------|
| 1 = + UB | black |
| 2 = GND | brown |
| 3 = PWM/LIN* | yellow |
| 4 = INVLIN | orange |
| 5 = LOWER | blue |
| 6 = Diagnostic output | white |

AMP Junior Power Timer, 6-pole, coded;
connecting lead (460 mm) with mating plug;
part no. 02002-4-1021 (not included in delivery)

* optionally LIN-BUS

◀ "V"

EC axial fans

with brushless DC motor, Ø 300



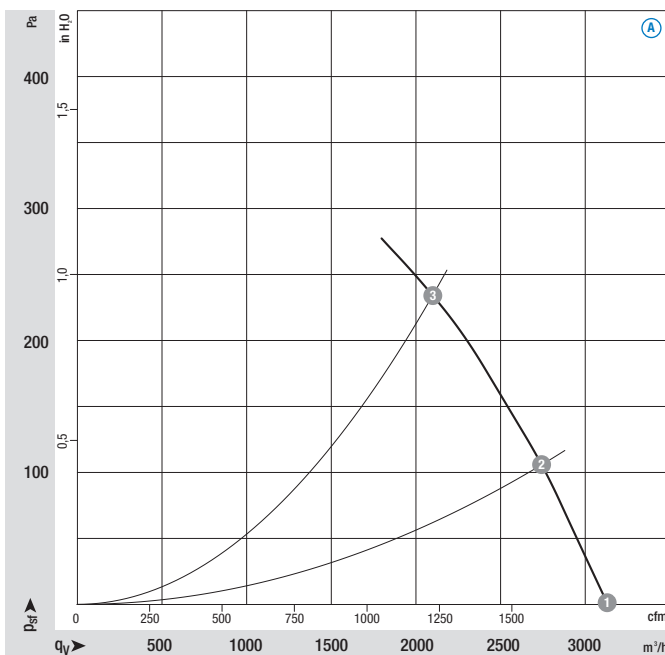
- **Material:** Wall ring: PP plastic, coloured black
Impeller: PBT plastic, coloured black (conforms to UL 94 HB)
- **Direction of rotation:** Clockwise, seen on rotor
- **Direction of air flow:** "A", exhaust over struts
- **Type of protection:** IP 24 KM
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings
- **Motor protection:** Overtemperature protection, reverse polarity and locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** VDE 0879-2, interference suppression grade 5

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Max. operative range | Perm. amb. temp. | Mass | Electr. connection |
|--------------------------------|-----------|-------|-----------------|-----------------------|-----------|-----------|-------------|--------------|----------------------|----------------------|--------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | dB(A) | Pa | °C | kg | |
| W3G300-ER38 -45 ⁽¹⁾ | M3G074-CF | A | 27,5 | 16-32 | 3135 | 3320 | 335 | 12,2 | 87 | 275 | -40...+85 ⁽²⁾ | 2,5 | C |

subject to alterations

⁽¹⁾ 24-volt variant ⁽²⁾ at free air not recommended for long-term operation at 85 °C

Curves



Air performance measured as per: ISO 5801, Installation category A, without protection against accidental contact

Suction-side noise levels:
L_{pA} measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 56 ff.

| | n rpm | P _e W | I A | L _{pA} dB(A) |
|-----|----------|---------------------|--------|--------------------------|
| A 1 | 3320 | 335 | 12,2 | 87 |
| A 2 | 3295 | 354 | 12,8 | 85 |
| A 3 | 3255 | 367 | 13,3 | 86 |

EC axial fans

with brushless DC motor, Ø 385

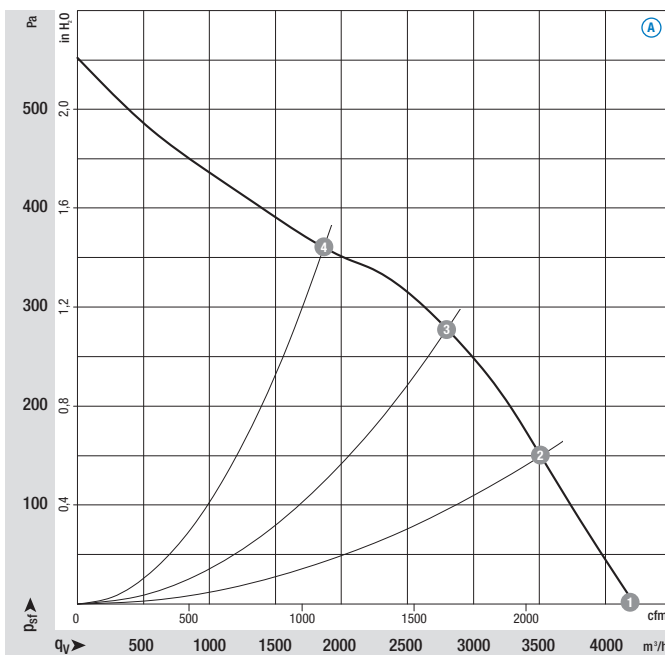


- **Material:** Wall ring: PA plastic, coloured black
Impeller: PA plastic, coloured black (conforms to UL 94 HB)
- **Direction of rotation:** Clockwise, seen on rotor
- **Direction of air flow:** "V", exhaust over struts
- **Type of protection:** Motor: IP 24 KM, Electronics: IP 66 / 69 K
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings
- **Motor protection:** Overtemperature protection, locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** VDE 0879-2, interference suppression grade 5
- **Qualified to:** DIN ISO 16750

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|--------------------------------|-----------|-------|-----------------|-----------------------|-----------|-----------|-------------|--------------|----------------------|--------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | |
| W3G385-CT53 -61 ⁽¹⁾ | M3G084-CF | Ⓐ | 13,5 | 9-16 | 4220 | 3250 | 565 | 41,9 | 80 | -40..+105 ⁽²⁾ | 3,1 | L |

subject to alterations ⁽¹⁾ 12-volt variant ⁽²⁾ over + 70 °C with power derating

Curves



Air performance measured as per: ISO 5801, Installation category A, without protection against accidental contact

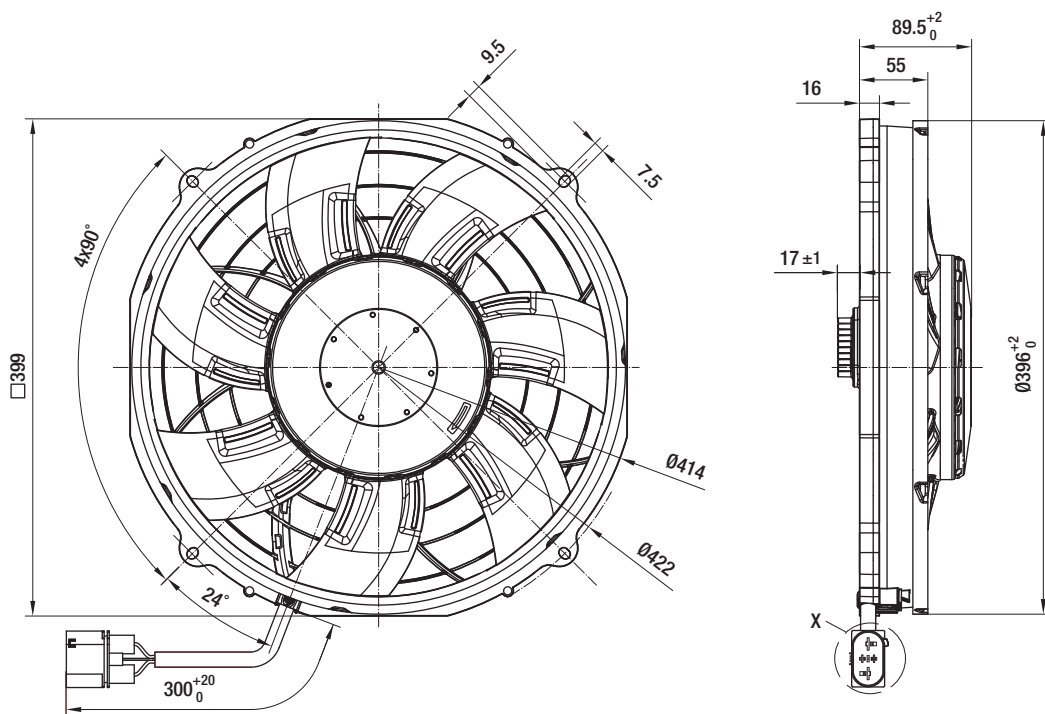
Suction-side noise levels:
L_{pA} measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 56 ff.

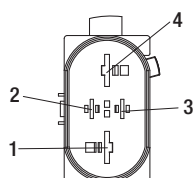
| | n rpm | P _e W | I A | L _{pA} dB(A) |
|-----|----------|---------------------|--------|--------------------------|
| Ⓐ 1 | 3250 | 565 | 41,9 | 80 |
| Ⓐ 2 | 3140 | 595 | 44,1 | 79 |
| Ⓐ 3 | 2985 | 620 | 45,9 | 77 |
| Ⓐ 4 | 2840 | 620 | 45,9 | 76 |



◀ "V"

Bushing on customer side:

| | |
|-----------|---------------------|
| Housing: | FCI 30432101 |
| Pins: | 9,5 mm FCI 60070461 |
| | 4,8 mm FCI 60040431 |
| Sealings: | FCI 60993301 |
| | FCI 60992607 |



View X

| | |
|------------------------|--------|
| 1 = + UB | black |
| 2 = Diagnostic output* | white |
| 3 = PWM/LIN | yellow |
| 4 = GND | brown |

* optionally LIN-BUS

EC axial fans

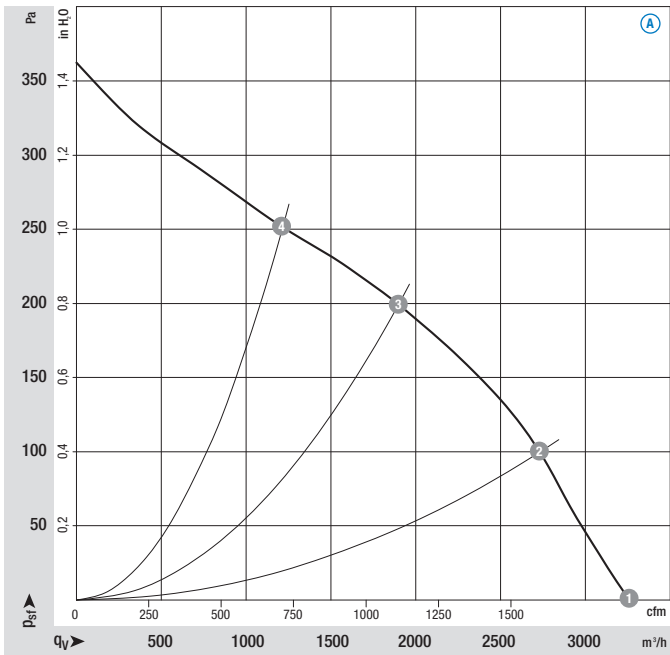
with brushless DC motor, Ø 385



- **Material:** Wall ring: PA plastic, coloured black
Impeller: PA plastic, coloured black (conforms to UL 94 HB)
- **Direction of rotation:** Clockwise, seen on rotor
- **Direction of air flow:** "V", exhaust over struts
- **Type of protection:** Motor: IP 24 KM, Electronics: IP 66 / 69 K
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position:** Any
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings
- **Motor protection:** Overtemperature protection, reverse polarity and locked-rotor protection, load dump protection, under-voltage detection
- **EMC requirements:** VDE 0879-2, interference suppression grade 5
- **Qualified to:** DIN ISO 16750

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|--------------------------------|-----------|--------------------------------|-----------------|---|-----------|-----------|-------------|--------------|----------------------|--------------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | |
| W3G385-BV44 -01 ⁽¹⁾ | M3G084-BF | Ⓐ | 26 | 16-32 | 3260 | 2470 | 245 | 9,4 | 75 | -40..+110 ⁽²⁾ | 2,7 | H |
| subject to alterations | | ⁽¹⁾ 24-volt variant | | ⁽²⁾ over + 95 °C with power derating | | | | | | | | |

Curves



Air performance measured as per: ISO 5801, Installation category A, without protection against accidental contact

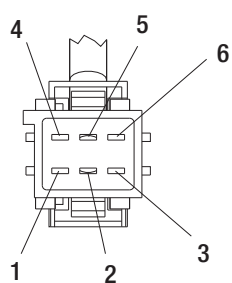
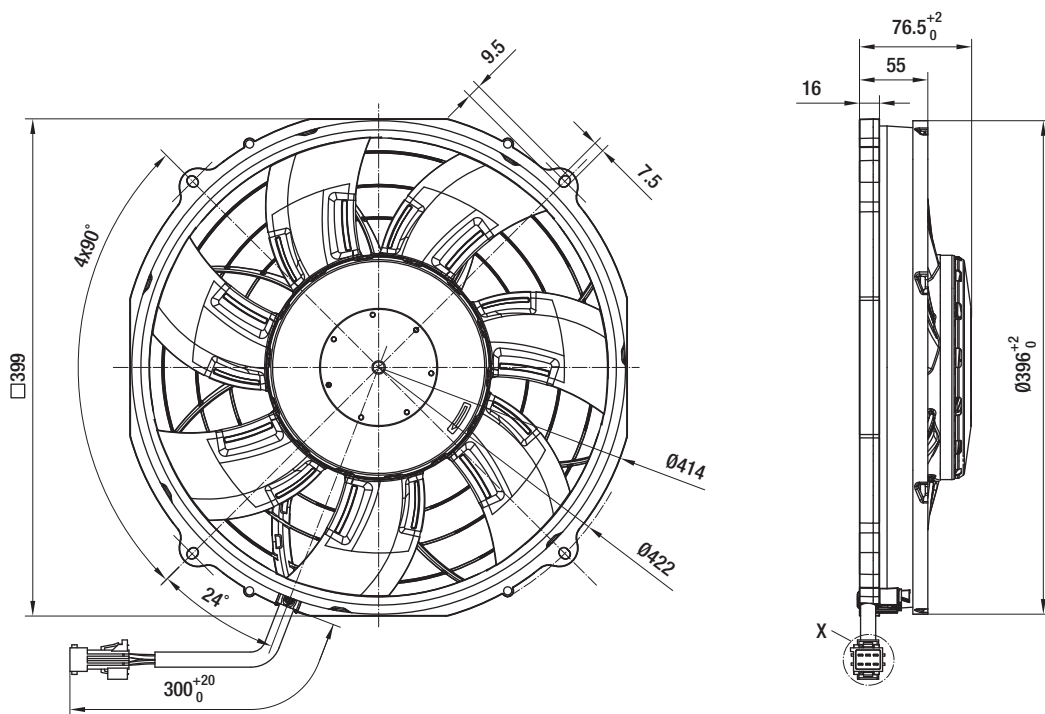
Suction-side noise levels:
L_{pA} measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 56 ff.

| | n rpm | P _e W | I A | L _{pA} dB(A) |
|-----|----------|---------------------|--------|--------------------------|
| Ⓐ 1 | 2470 | 245 | 9,4 | 75 |
| Ⓐ 2 | 2380 | 261 | 10,0 | 72 |
| Ⓐ 3 | 2230 | 262 | 10,1 | 70 |
| Ⓐ 4 | 2145 | 263 | 10,1 | 72 |

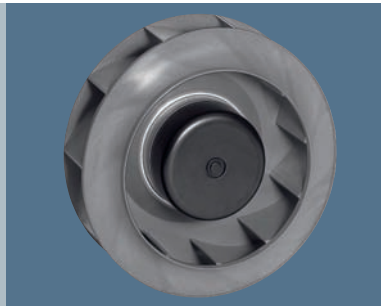


View X

- | | |
|-----------------------|--------|
| 1 = + UB | black |
| 2 = GND | brown |
| 3 = PWM/LIN* | yellow |
| 4 = INVLIN | orange |
| 5 = LOWER | blue |
| 6 = Diagnostic output | white |

AMP Junior Power Timer, 6-pole, coded;
connecting lead (460 mm) with mating plug;
part no. 02002-4-1021 (not included in delivery)

* optionally LIN-BUS



EC centrifugal fans backward curved



EC centrifugal fans

backward curved, Ø 220

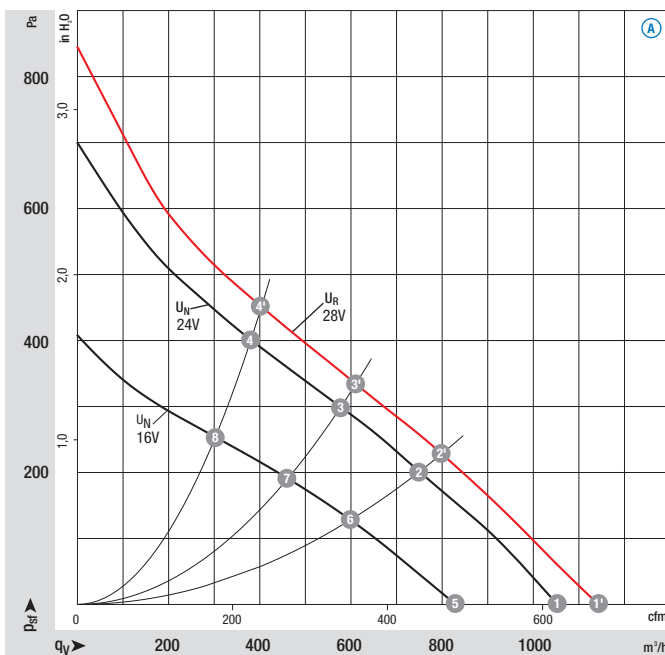


- **Material:** Impeller: impeller completely made of PA 6.6 GV plastic, injection-moulded round sheet-metal plate
- **Direction of rotation:** Clockwise, seen on rotor
- **Insulation class:** "B" in accordance with EN 60335-1
- **Mounting position/condensate discharges:** Rotor on bottom with condensate discharge holes is standard
- **Bearings:** Maintenance-free ball bearings
- **Technical features:** Control input 0-10 VDC / PWM, tach output
- **Motor protection:** reverse polarity and locked-rotor protection
- **Cable exit:** Variable
- **Mounting situation:** The parameters of the specific installation situation must be co-ordinated with ebm-papst!
- **Mode of operation:** Continuous operation (S1)

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|---------------------------------|-----------|-------|-----------------|-----------------------|-----------|-----------|-------------|--------------|----------------------|------------------|------|--------------------|
| Type | Motor | | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | |
| R1G 220-AB35 -92 ⁽¹⁾ | M1G074-BF | A | 24 | 16-28 | 1055 | 3150 | 106 | 5,0 | 76 | -25...+60 | 1,4 | E |

subject to alterations ⁽¹⁾ Also possible as 12-volt variant

Curves



Air performance measured as per: ISO 5801, Installation category A, in ebm-papst full nozzle and without protection against accidental contact

Suction-side noise levels: L_{pA} measured at 1 m distance to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

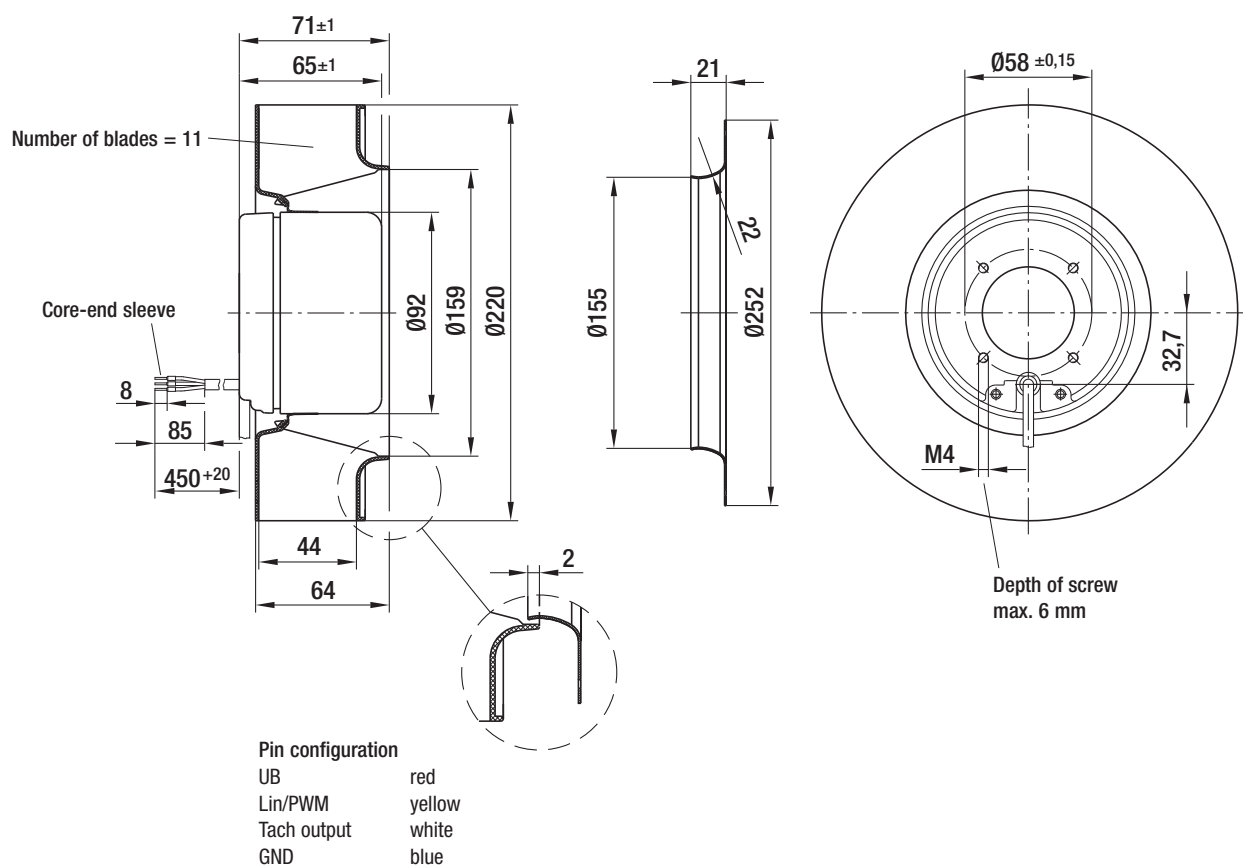
With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 56 ff.

| | n rpm | P_e W | I A | L_{pA} dB(A) |
|------------------|----------|------------|--------|-------------------|
| A 1 ¹ | 3400 | 128 | 5,3 | 78 |
| A 2 ² | 3200 | 132 | 5,8 | 69 |
| A 3 ³ | 3050 | 135 | 6,0 | 67 |
| A 4 ⁴ | 3000 | 137 | 5,8 | 71 |
| A 1 | 3150 | 106 | 5,0 | 76 |
| A 2 | 3010 | 110 | 5,4 | 68 |
| A 3 | 2870 | 112 | 5,5 | 65 |
| A 4 | 2800 | 113 | 5,4 | 69 |
| A 5 | 2470 | 50 | 3,5 | 70 |
| A 6 | 2360 | 54 | 4,0 | 63 |
| A 7 | 2300 | 57 | 4,1 | 59 |
| A 8 | 2250 | 59 | 4,0 | 63 |



| Type | Inlet nozzle |
|------------------|--------------|
| R1G 220-AB35 -92 | 09609-2-4013 |




EC centrifugal fans

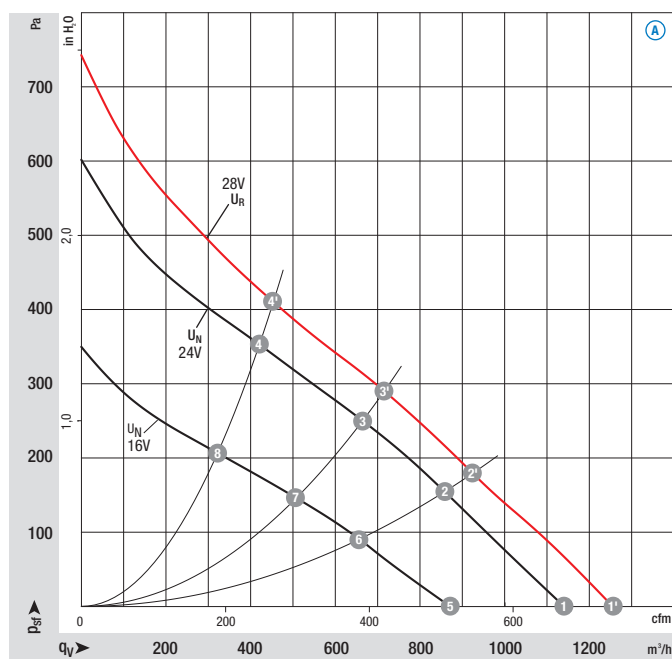
backward curved, Ø 250



- **Material:** Impeller: impeller made of PA 6.6 GV plastic, round sheet-metal plate
- **Direction of rotation:** Clockwise, seen on rotor
- **Insulation class:** “B” in accordance with EN 60335-1
- **Mounting position/condensate discharges:**
Rotor on bottom with condensate discharge holes is standard
- **Bearings:** Maintenance-free ball bearings
- **Technical features:** Control input 0-10 VDC / PWM, tach output
- **Motor protection:** reverse polarity and locked-rotor protection
- **Cable exit:** Variable
- **Mounting situation:** The parameters of the specific installation situation must be co-ordinated with ebm-papst!
- **Mode of operation:** Continuous operation (S1)

| Nominal data | | Curve | Nominal voltage | Nominal voltage range | Flow rate | Speed/rpm | Input power | Current draw | Sound pressure level | Perm. amb. temp. | Mass | Electr. connection |
|---------------------------------|-----------|---|-----------------|-----------------------|-----------|-----------|-------------|--------------|----------------------|------------------|------|--------------------|
| Type | Motor | VDC | VDC | m³/h | rpm | W | A | dB(A) | °C | kg | | |
| R1G 250-AQ21 -42 ⁽¹⁾ | M1G074-CF |  | 24 | 16-28 | 1140 | 2540 | 93 | 4,3 | 73 | -25..+60 | 2,0 | E |
| subject to alterations | | ⁽¹⁾ Also possible as 12-volt variant | | | | | | | | | | |

Curves















Air performance measured
as per: ISO 5801,
Installation category A,
in ebm-papst full nozzle
and without protection against
accidental contact

Suction-side noise levels:
 L_p A measured at 1 m distance
 to fan axis

The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

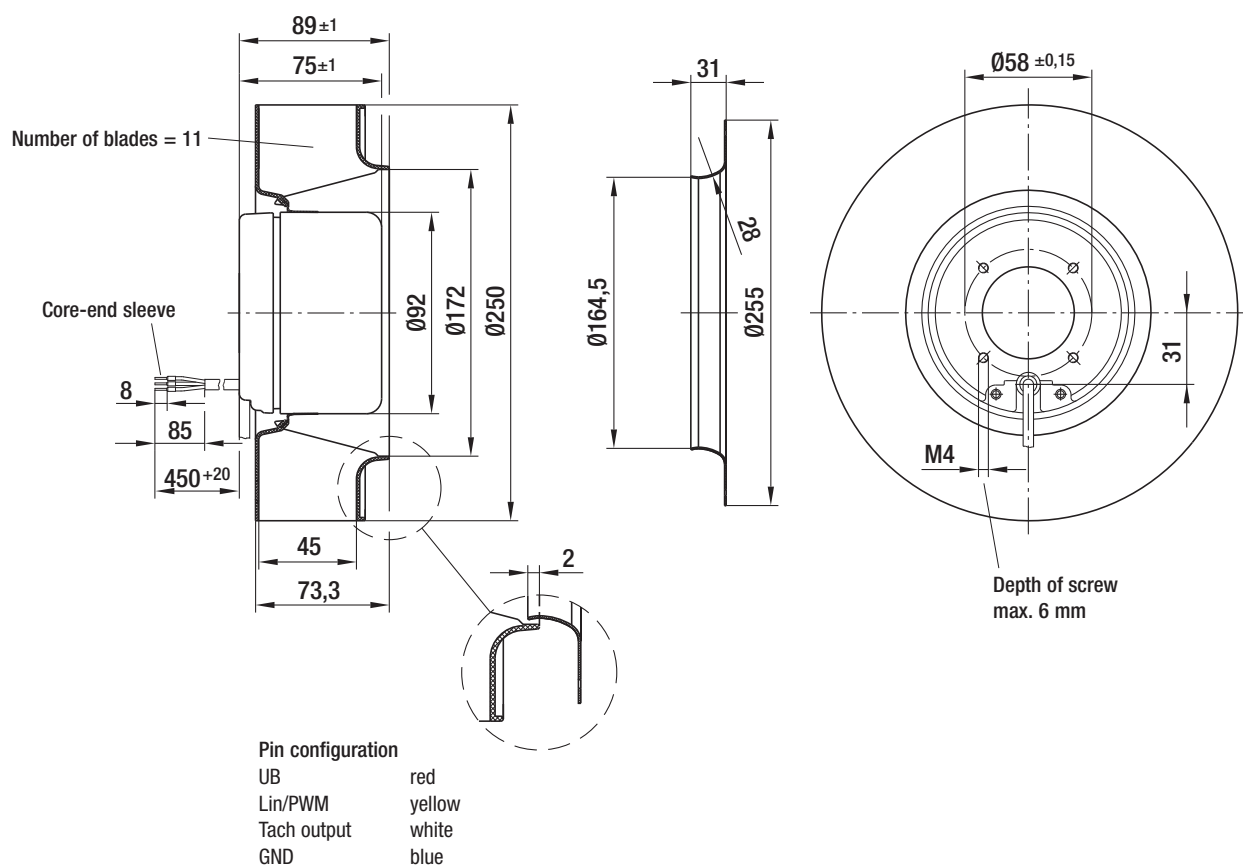
With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information
see page 56 ff.

| | n | P _e | I | L _{pA} |
|---|------|----------------|-----|-----------------|
| | rpm | W | A | dB(A) |
|  1 | 2970 | 124 | 4,9 | 75 |
|  2 | 2530 | 132 | 5,3 | 68 |
|  3 | 2500 | 134 | 5,4 | 63 |
|  4 | 2560 | 131 | 5,3 | 66 |
|  1 | 2540 | 93 | 4,3 | 73 |
|  2 | 2370 | 105 | 4,9 | 66 |
|  3 | 2330 | 108 | 5,0 | 62 |
|  4 | 2380 | 105 | 4,9 | 64 |
|  5 | 1940 | 42 | 3,1 | 68 |
|  6 | 1810 | 49 | 3,5 | 62 |
|  7 | 1790 | 50 | 3,6 | 57 |
|  8 | 1820 | 49 | 3,5 | 59 |



| Type | Inlet nozzle |
|------------------|--------------|
| R1G 250-AQ21 -42 | 96359-2-4013 |



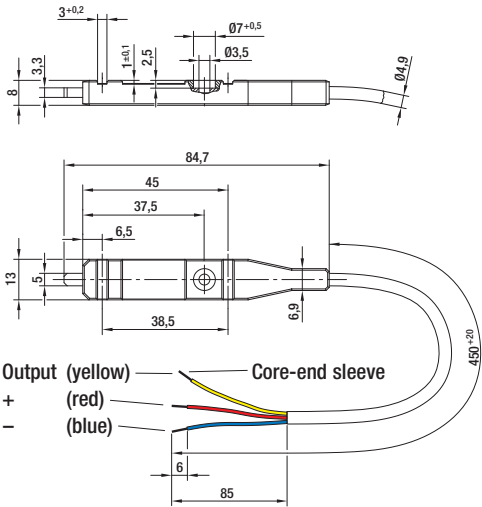
Temperature control module



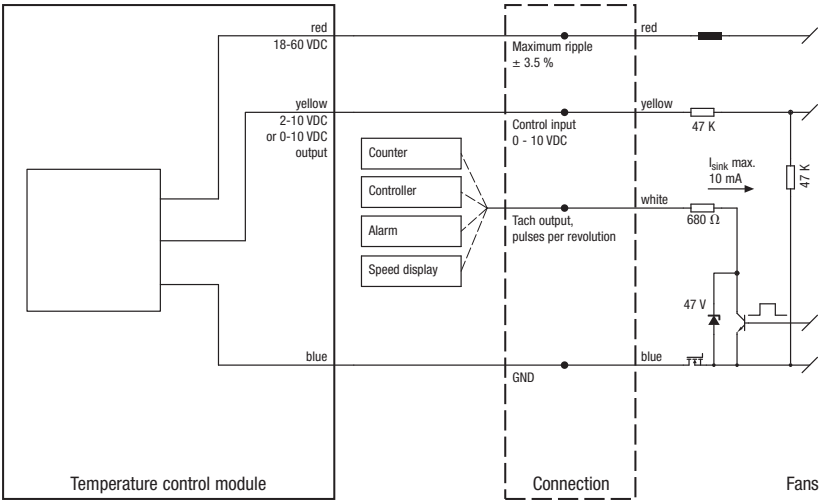
– Type of protection: IP42

| Nominal data | Nominal voltage | Current draw | Output voltage | Output current | Output impedance | Temperature control range | Mass |
|--------------|-----------------|--------------|----------------|----------------|------------------|---------------------------|------|
| Part no. | VDC | mA | VDC | mA | kΩ | °C | kg |
| 50002-1-0174 | 18-60 | 10 | 2-10 | 0,1 | 6,8 | +30..+55 | 0,02 |
| 50003-1-0174 | 18-60 | 10 | 0-10 | 0,1 | 6,8 | +10..+45 | 0,02 |

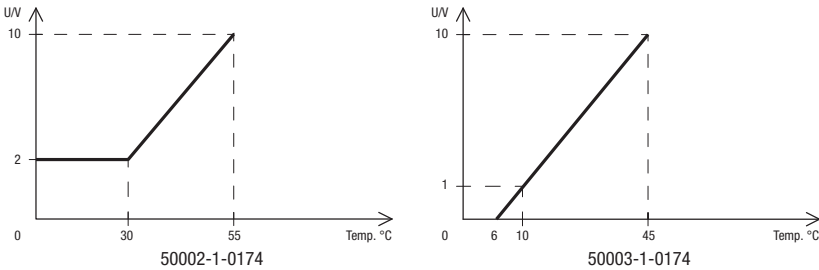
subject to alterations



– Electr. connection:



– Control function: Both designs have “cooling” as control function



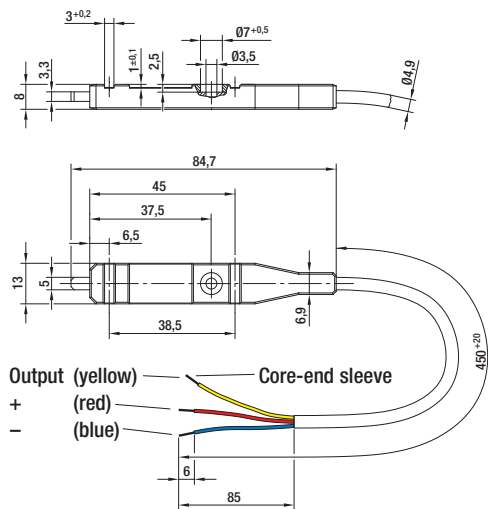
Tolerance ±3 K

Temperature sensor

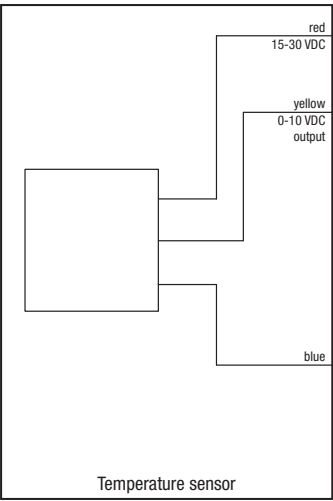


– Type of protection: IP42

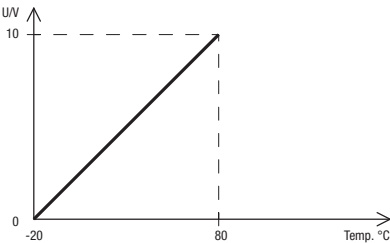
| Nominal data | | Nominal voltage | Current draw | Output voltage | Output current | Output impedance | Temperature measuring range | Mass |
|------------------------|--|-----------------|--------------|----------------|----------------|------------------|-----------------------------|------|
| Part no. | | VDC | mA | VDC | mA | kΩ | °C | kg |
| 50005-1-0174 | | 15-30 | 10 | 0-10 | 1,0 | 1,1 | -20..+80 | 0,02 |
| subject to alterations | | | | | | | | |



– Electr. connection:

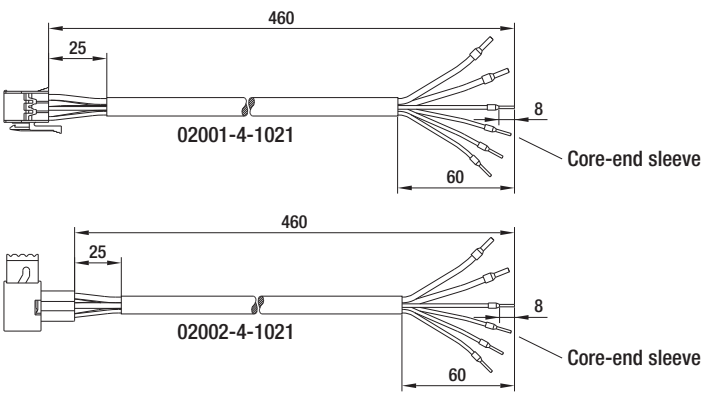


– Output voltage depending on temperature:



Tolerance ± 3 K

Accessories



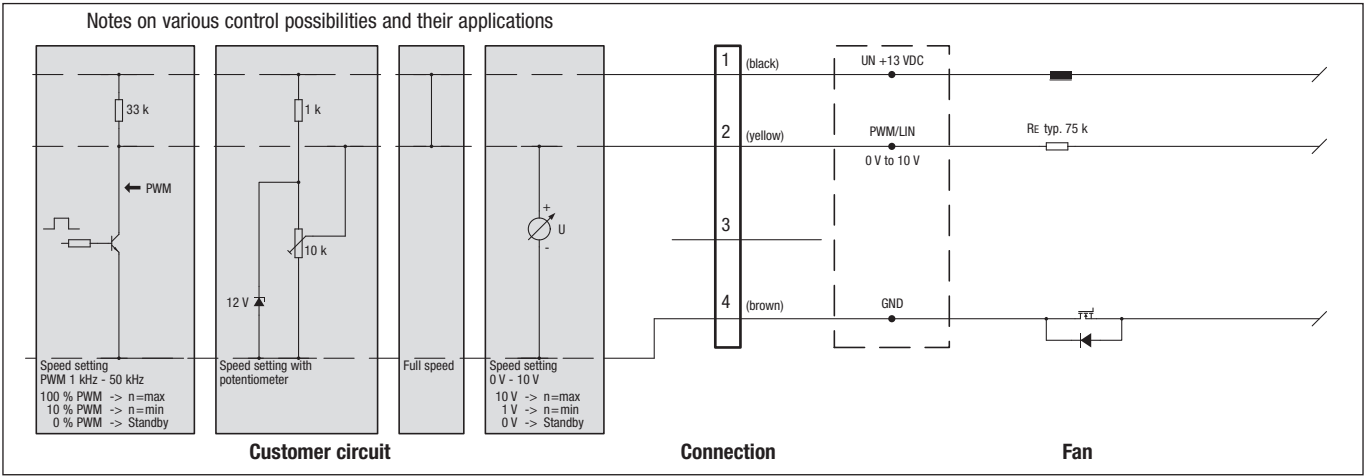
Connection leads

| Part no. | Application |
|--------------|----------------------------|
| 02001-4-1021 | EC dual centrifugal blower |
| 02002-4-1021 | EC axial fan |

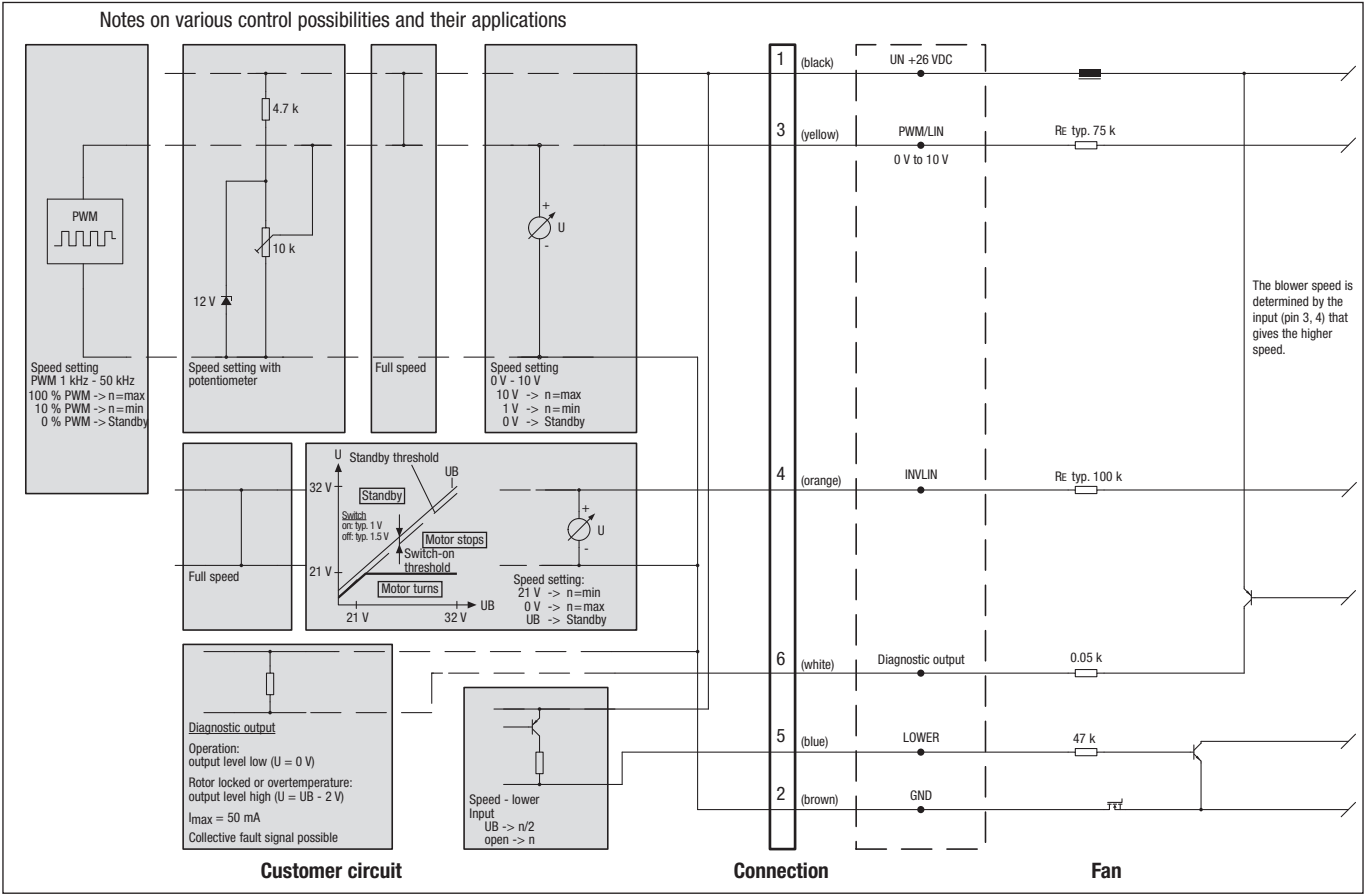
subject to alterations

Electrical connections

A) 13 VDC electrical connection (EC dual centrifugal blowers “Premium”)

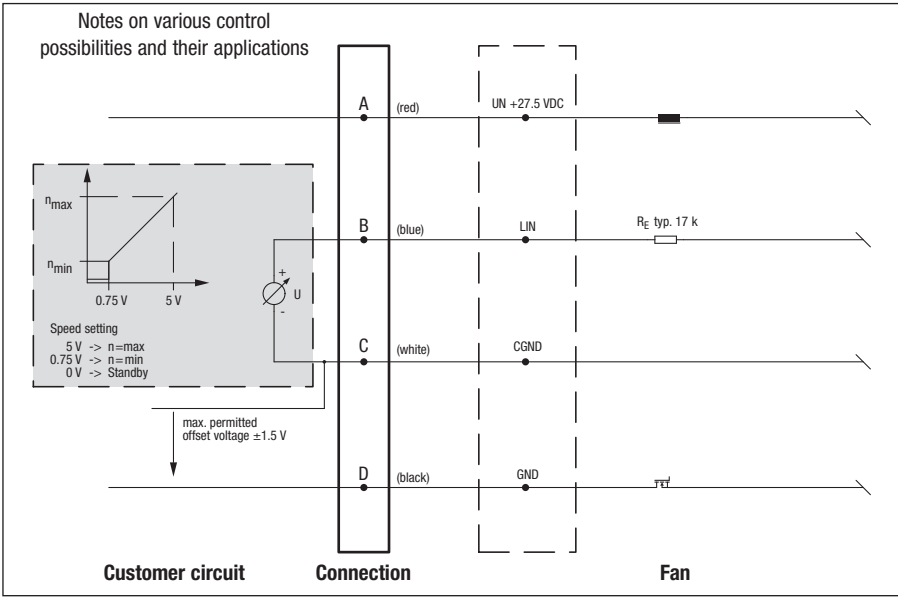


B) 26 VDC electrical connection

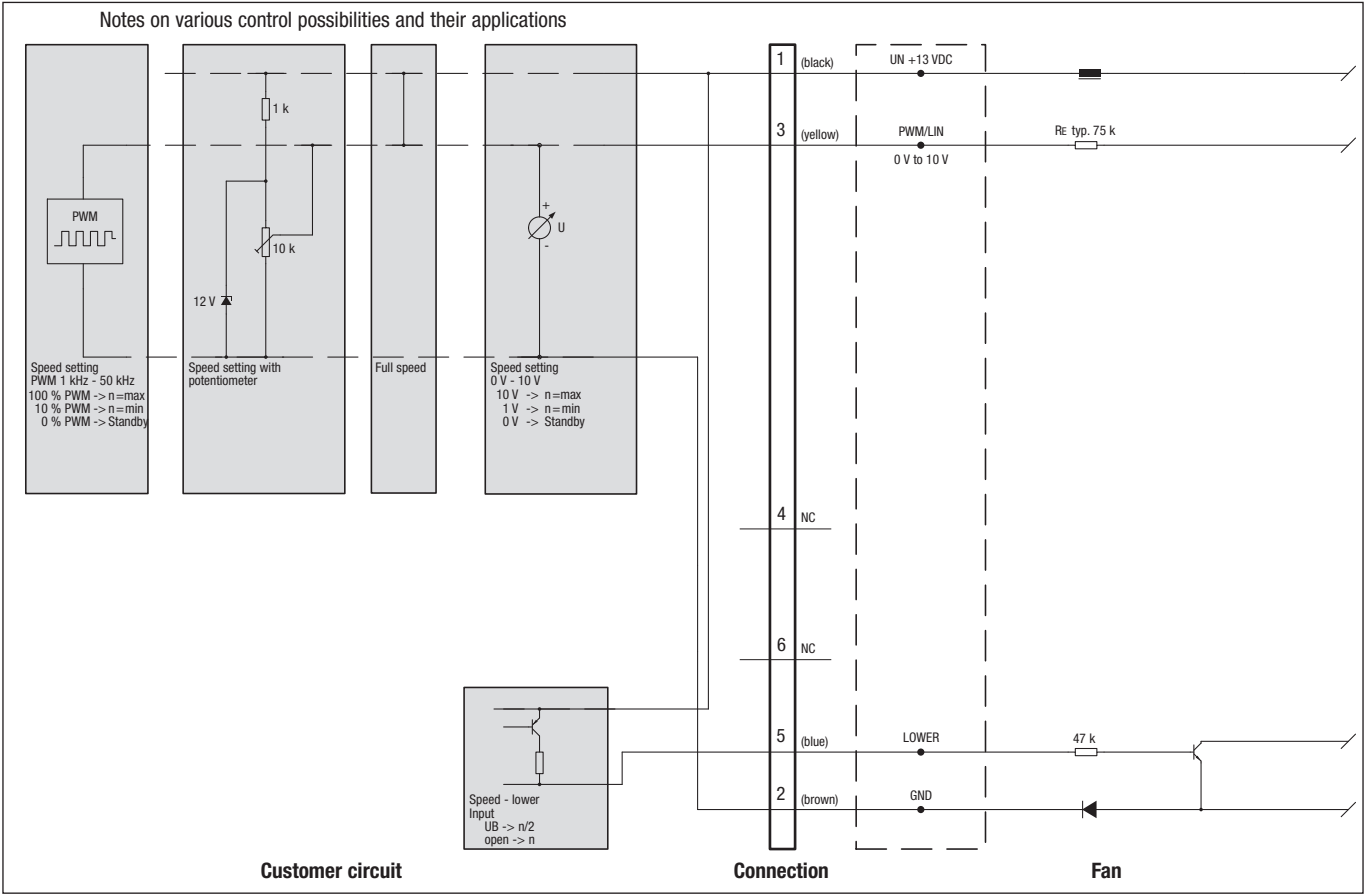


Electrical connections

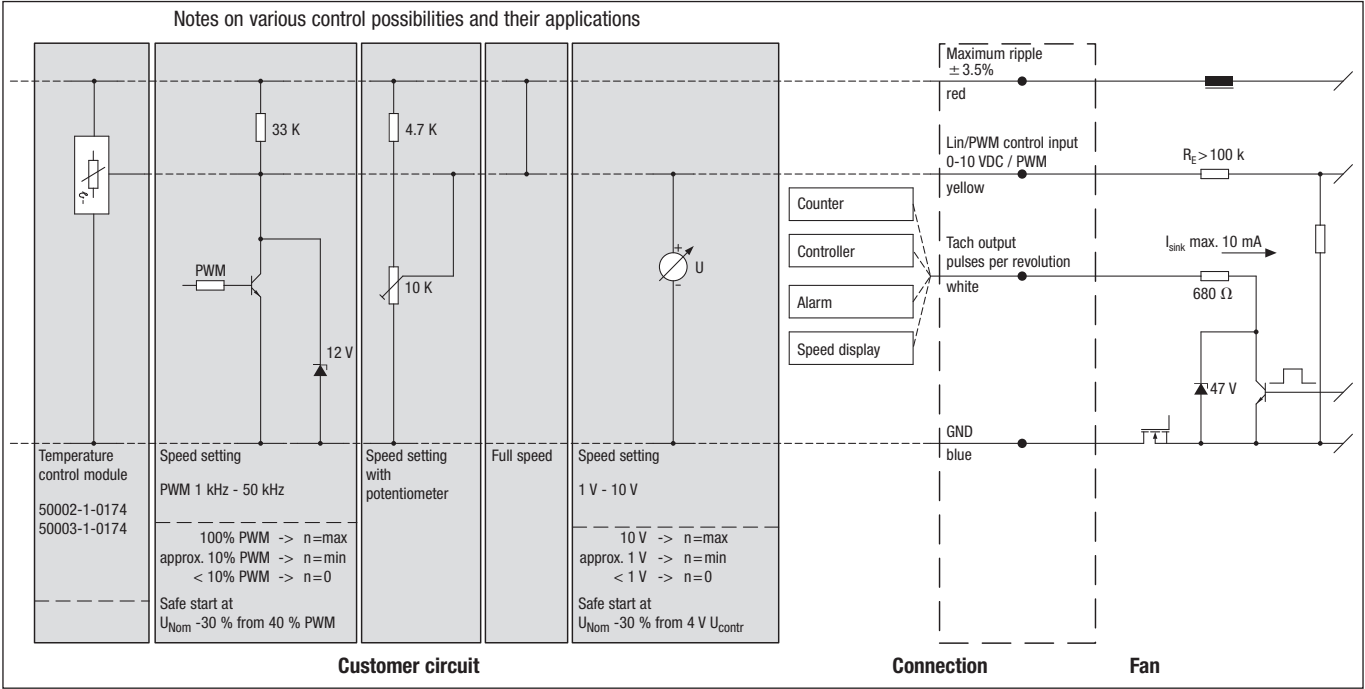
C) 27.5 VDC electrical connection



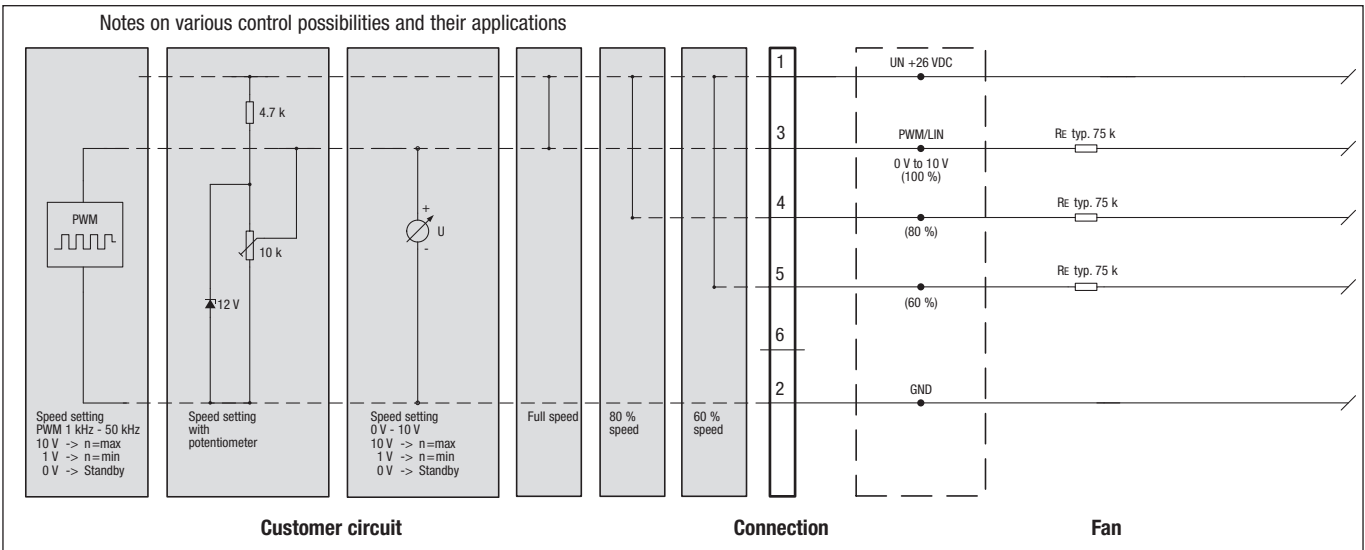
D) 13 VDC electrical connection (EC axial fans)



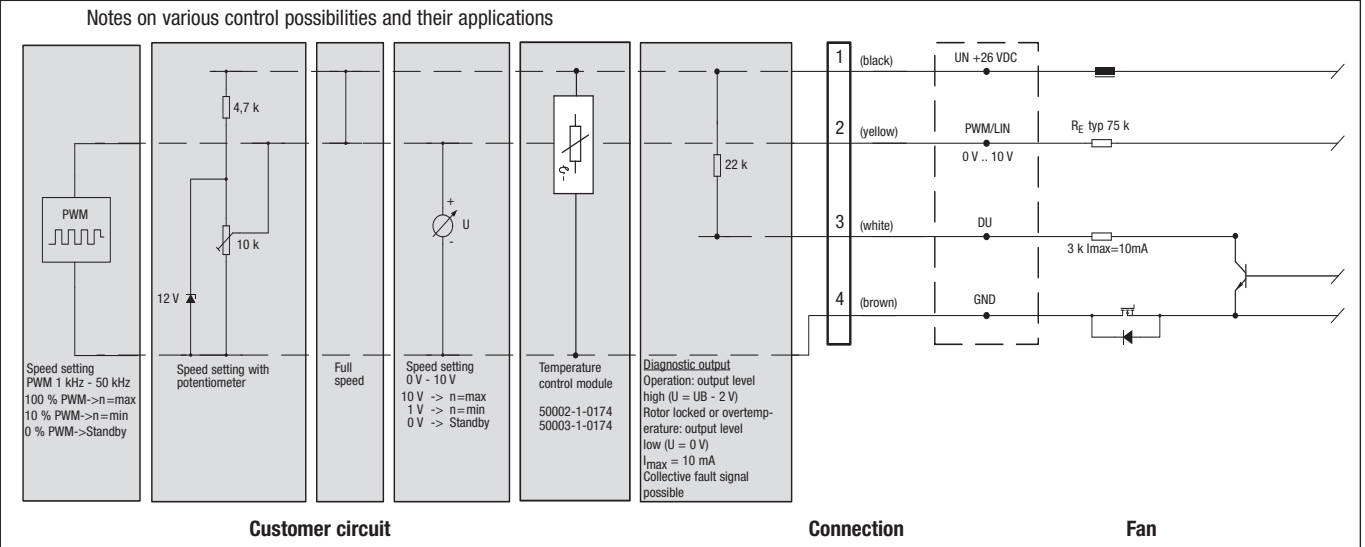
E) 24 VDC electrical connection



F) 26 VDC electrical connection (EC dual centrifugal blowers “Basic”)

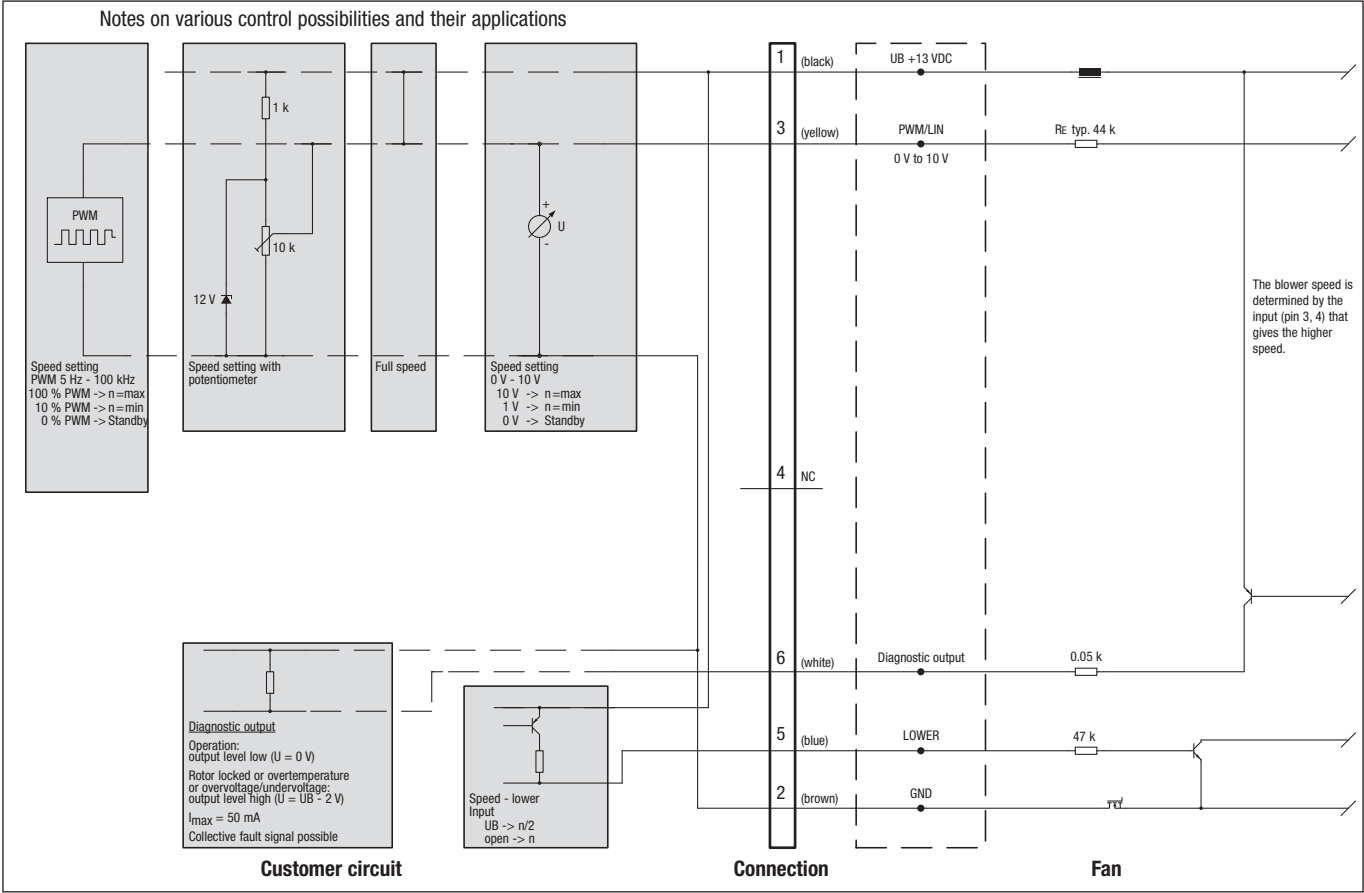


G) 26 VDC electrical connection (EC dual centrifugal blowers „Premium/Power“)

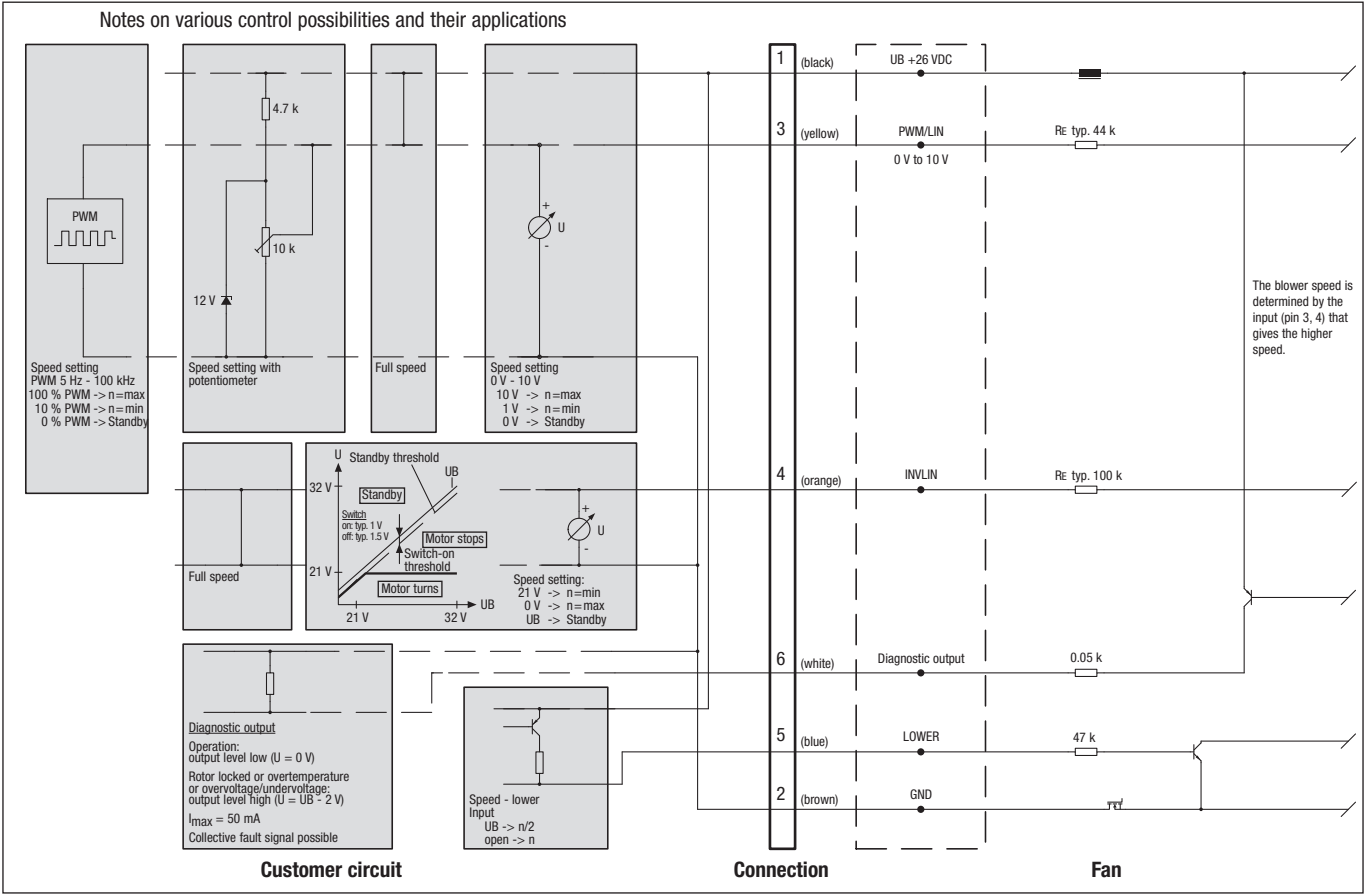


Electrical connections

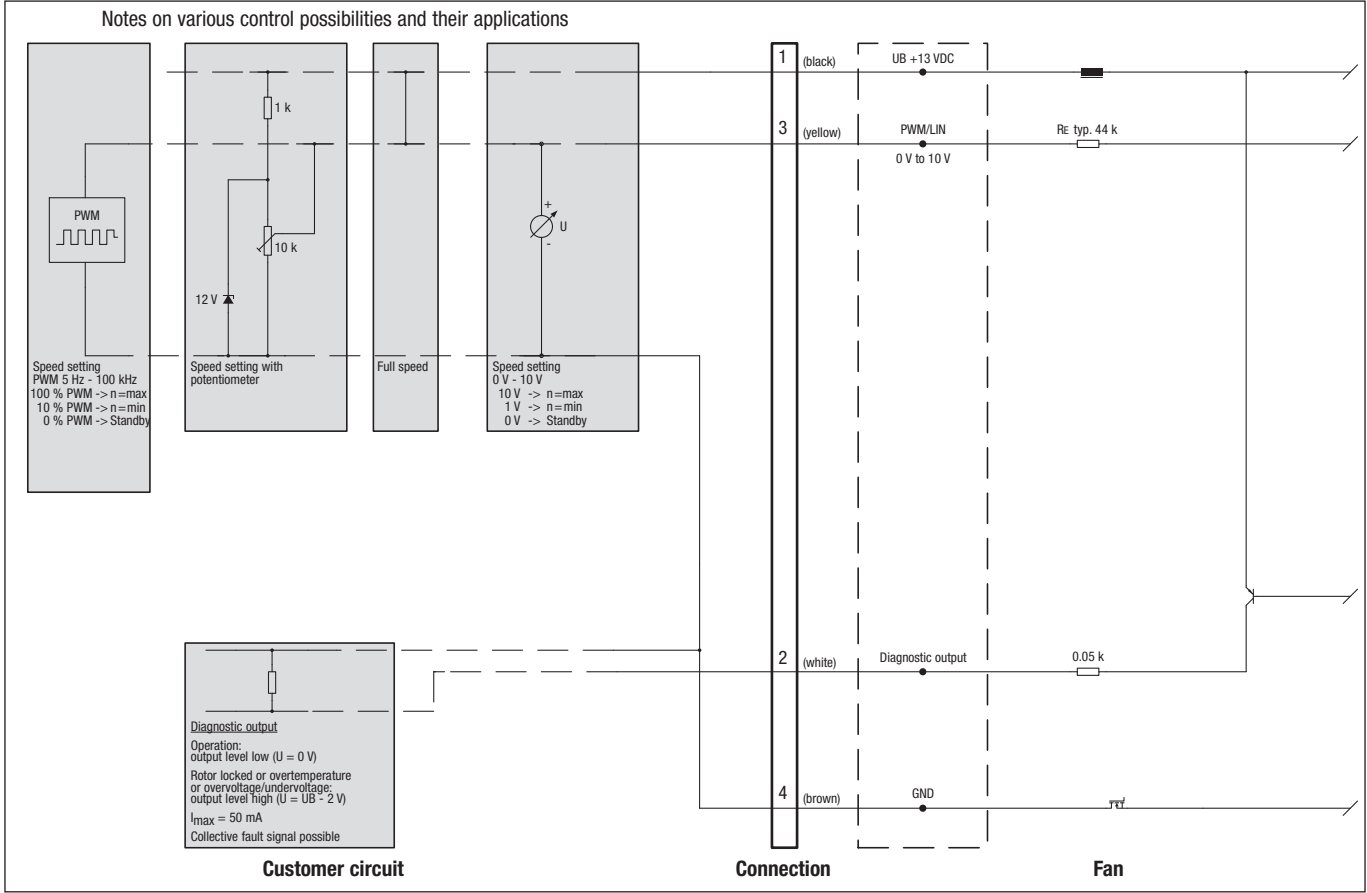
K) 13 VDC electrical connection (EC axial fans „Premium“)



H) 26 VDC electrical connection (EC axial fans „Premium/Power“)



L) 13 VDC electrical connection (EC axial fans „Power“)



Technical parameters & scope



High standards for all ebm-papst products

Here at ebm-papst, we constantly strive to further improve our products in order to be able to offer you the best possible product for your application. Careful monitoring of the market ensures that technical innovations are reflected in the improvements of our products.

Based on the technical parameters listed below and the ambience you want our product to operate in, we here at ebm-papst can always work out the best solution for your specific application.

General performance parameters

Any deviations from the technical data and parameters described here are listed on the product-specific data sheet.

Type of protection

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

Insulation class

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

Mounting position

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

Condensate discharge holes

Information on the condensate discharge 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 depends mainly on the thermal load on the bearing.

The majority of our products use maintenance-free ball bearings for any mounting position possible.

The service life L10 of the ball bearings can be taken as approx. 40,000 operating hours at an ambient temperature of 40 °C, yet this estimate can vary according to the actual ambient conditions.

We will gladly provide you with a lifetime calculation taking into account your specific operating conditions.

Motor protection / thermal protection

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

Depending on motor type and field of application, the following protective features are realised:

- Thermal overload protection (TOP), in-circuit
- PTC/NTC with electronic diagnostics
- Current limitation via electronics

*Left: Endurance test room
Middle: Shock test
Right: Chamber test rig*



■ Mechanical strain / performance parameters

All ebm-papst products are subjected to comprehensive tests complying with the normative specifications. In addition to this, the tests also reflect the vast experience and expertise of ebm-papst.

Vibration test

Vibration tests are carried out in compliance with

- Vibration test in operation according to DIN IEC 68, parts 2-6
- Vibration test at standstill according to DIN IEC 68, parts 2-6

Shock load

Shock load tests are carried out in compliance with

- Shock load according to DIN IEC 68, parts 2-27

Balancing quality

Testing the balancing quality is carried out in compliance with

- Residual imbalance according to DIN ISO 1940
- Standard balancing quality level G 6.3

Should you require a higher balancing quality level for your specific application, please let us know and specify this when ordering your product.

■ Chemo-physical strain / performance parameters

Should you have questions about chemo-physical strain, please direct them to your ebm-papst contact.

■ Fields of application, industries and applications

Our products are used in various industries and applications:

Ventilation, air-conditioning and refrigeration technology, clean room technology, automotive and rail technology, medical and laboratory technology, electronics, computer and office technology, telecommunications, household appliances, heating, machines and plants, drive engineering.

Our products are not designed for use in the aviation and aerospace industry!

■ Legal and normative directives

The products described in this catalogue are designed, developed and produced in keeping with the standards in place for the relevant product and, if known, the conditions governing the relevant fields 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.

Complying with the EMC standards has to be established on the final appliance, as different mounting situations can result in changed EMC properties.

Approvals

In case you require a specific approval for your ebm-papst automotive product (e1, UL, etc.) please let us know.

Most of our products can be supplied with the relevant approval.

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

■ Air performance measurements

All air performance measurements are carried out on suction side and on chamber test beds conforming to the specifications as per ISO 5801 and DIN 24163. The fans under test are installed in the measuring chamber at free air intake and exhaust (installation category A) and are operated at nominal voltage, with AC also at nominal frequency, and without any additional components such as guard grilles.

As required by the standard, the air performance curves correspond to an air density of 1.2 kg/m³.

Room for precision noise measuring



■ Measurement conditions for air and noise measurement

ebm-papst products are measured under the following conditions:

- Axial and diagonal fans in direction of rotation “V” in full nozzle and without guard grille
- Backward curved centrifugal fans, free-running and with inlet nozzle
- Forward curved single and dual inlet centrifugal fans with housing

■ Noise measurements

All noise measurements are carried out in low-reflective test rooms with reverberant floor. Thus the ebm-papst acoustic test chambers meet the requirements of precision class 1 according to DIN EN ISO 3745. For noise measurement, the fans being tested are placed in a reverberant wall and operated at nominal voltage (for AC, also at nominal frequency) without additional attachments such as the guard grille.

Sound pressure level and sound level

All acoustic values are established according to ISO 13347, DIN 45635 and ISO 3744/3745 to accuracy class 2 and given in A-rated form.

When the sound pressure level (L_p) is measured, the microphone is on the intake side of the fan being tested, usually at a distance of 1 m on the fan axis.

To measure 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 sound power level measured can be roughly calculated from the sound pressure level by adding 7 dB.

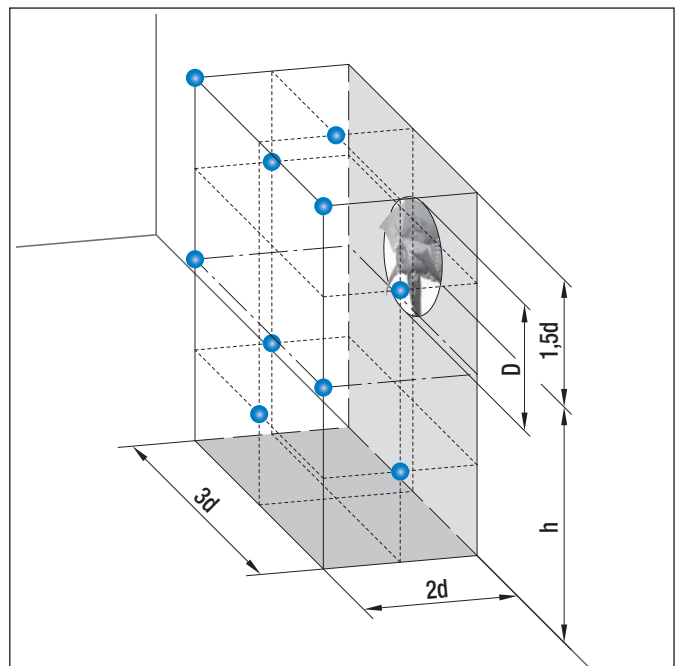
Measuring configuration as per ISO 13347-3 respectively DIN 45635-38:

- 10 measuring points

$d \geq D$

$h = 1,5d \dots 4,5d$

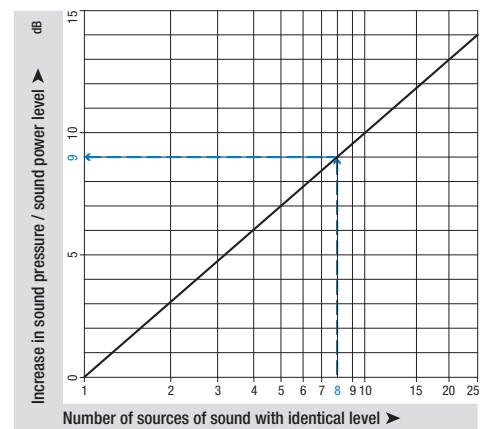
Measurement area $S = 6d^2 + 7d(h + 1,5d)$



Adding multiple noise sources with the same level

Adding 2 noise sources with the same volume results in a level increase of approx. 3 dB. The noise characteristics of multiple identical fans can be determined in advance based on the noise values specified in the data sheet. This is shown in the diagram opposite.

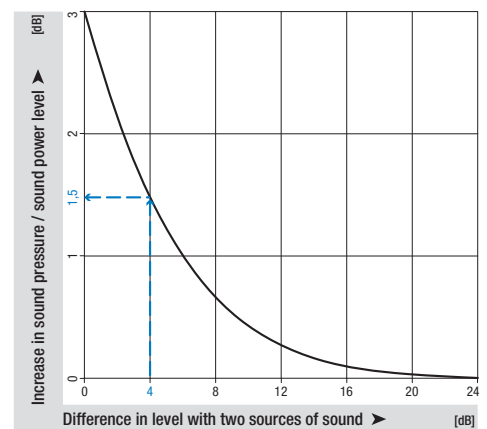
Example: 8 A3G800 axial fans are on a condenser. According to the data sheet, the sound pressure level of a fan is approximately 75 dB(A). The level increase measured from the diagram is 9 dB. Thus the overall sound level of the installation can be expected to be 84 dB(A).



Adding two noise sources with different levels

The acoustic performance of two different fans can be predetermined based on the sound levels given in the data sheet. This is shown in the diagram opposite.

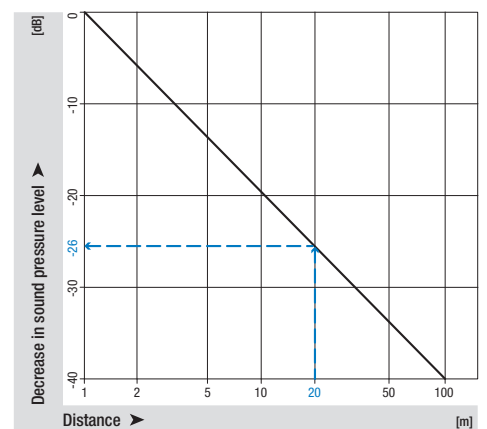
Example: There is an axial fan A3G800 with a sound pressure level of 75 dB(A) at the operating point and an axial fan A3G710 with 71 dB(A) in a ventilation unit. The level difference is 4 dB. The level increase can now be read in the diagram as approx. 1.5 dB. This means that the overall sound level of the unit can be expected to be 76.5 dB(A).



Distance laws

Sound power level is independent of distance to the sound source. In contrast to this, sound pressure level decreases the further away the noise source is. The adjacent diagram shows the decrease in level under far sound field conditions. Far sound field conditions apply whenever the distance between microphone and fan is big when compared to fan diameter and wavelength to be considered. For more information on far sound field, please consult the relevant literature on this complex topic. Per doubling of distance, the level in the far sound field decreases by 6 dB. In the near field of the fan, other correlations apply and the decrease in levels can be considerably smaller. The following example only applies to far sound field conditions and can vary strongly depending on the installation effects:

With an axial fan A3G300, a sound pressure level of 65 dB(A) was measured at a distance of 1 m. According to the adjacent diagram, at a distance of 20 m we would get a reduction by 26 dB, i.e. a sound pressure level of 39 dB(A).





fan agent



compact fan agent



motor specialist



motor agent

ebm-papst in Germany

Germany

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Jens.Duchow@de.ebmpapst.com



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