

Compact centrifugal modules with AC, EC and DC motors

version 06/2010



The engineer's choice

ebmpapst

Compact centrifugal modules

Centrifugal fans with backward curved blades need additional components so they can be placed inside the final unit without putting their proper function at risk. In the past, the majority of such components used to be designed and built by the unit manufacturers themselves.

With the new compact centrifugal modules, this extra expenditure is no longer needed, as they come with a square mounting plate with integrated inlet nozzle and motor suspension.

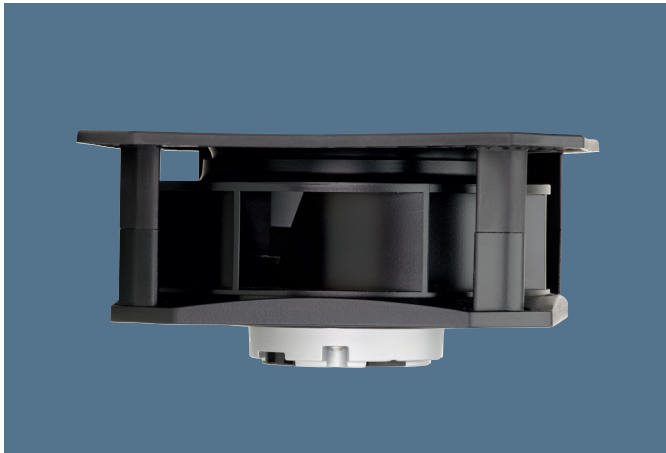
Mounting plate, inlet nozzle and motor suspension are made of robust and durable plastic, with the additional benefit of not having to go for compromises in terms of aero-acoustic design.

The centrifugal modules are available with impellers in diameters ranging from 190 to 225 mm and with either AC, EC or DC motors. They are extremely compact and simple to install – adjusting the impeller to the nozzle at great expense is no longer needed. Optionally, a guard grille on the suction side may be plugged on.

Take advantage of what a completely pre-installed functional unit has to offer:

- Compact design
- Optimised, certified and guaranteed functional unit
- Plug-and-Play characteristics
- AC, EC and DC versions with dimensions allowing for simple interchange
- Optional guard grille
- Simple logistics

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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.

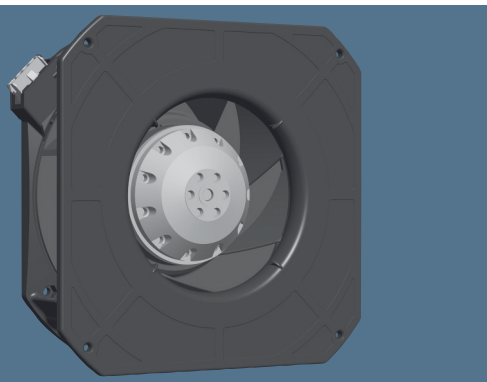
Every step in our chain of production meets the stringent standards of environmental specialists and the public. The 2008 Environmental Prize of Baden-Wuerttemberg, the Green Award 2009, the Energy Efficiency Award 2009 of the dena – to give just a few examples – testify to this. The environmental advantage 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 ebm-papst EC technology. 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 EC technology does not (yet) make sense from an application viewpoint – feature the greatest possible connection of economy and ecology.

AC centrifugal module

backward curved, Ø 190



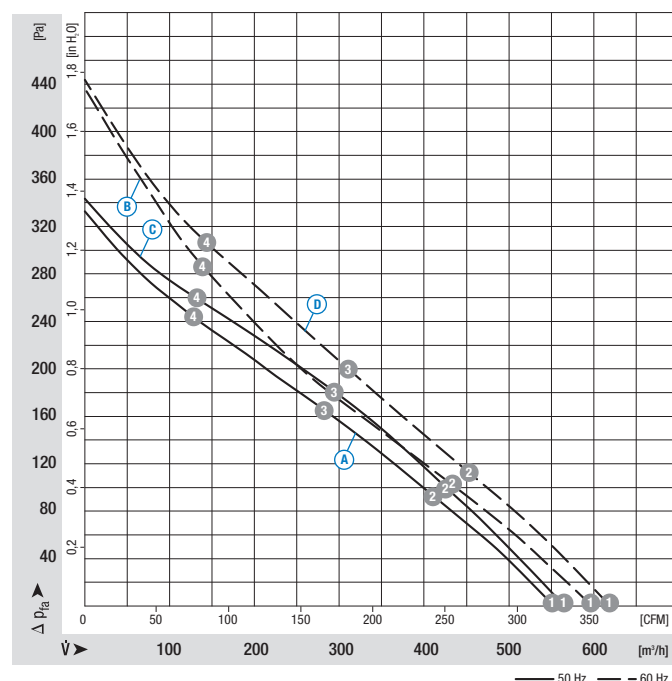
- **Material:** Housing: PA plastic 6, fibreglass-reinforced
Impeller: PA plastic 6, fibreglass-reinforced
Rotor: Coated in black
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 44
- **Insulation class:** "B"
- **Mounting position:** Shaft horizontal or rotor on bottom; rotor on top on request
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data		Curve	Nominal voltage	Frequency	Air flow	Speed/rpm	Power input	Current draw	Capacitor	Sound level	Perm. amb. temp.	Electr. connection
Type	Motor	VAC	Hz	m ³ /h	rpm	W	A	µF/VDB	dB(A)	°C	p. 28	
K2E 190 ⁽¹⁾	M2E 068-BF	A	1~ 115	50	550	2400	50	0,45	6,0/250	68	-25..+60	A1)
		B	1~ 115	60	590	2600	62	0,55	6,0/250	69	-25..+60	
K2E 190 ⁽²⁾	M2E 068-BF	C	1~ 230	50	560	2500	57	0,26	2,0/400	68	-25..+50	A1)
		D	1~ 230	60	610	2700	74	0,33	2,0/400	70	-25..+55	

subject to alterations

⁽¹⁾ external capacitor required; ⁽²⁾ capacitor included

Curves



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

Suction-side noise levels: L_{wA} as per ISO 13347, 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 32 ff.

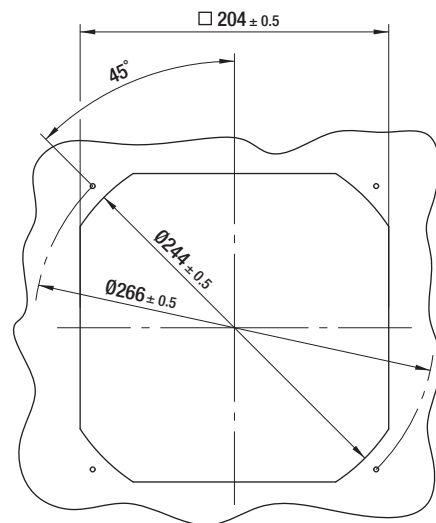
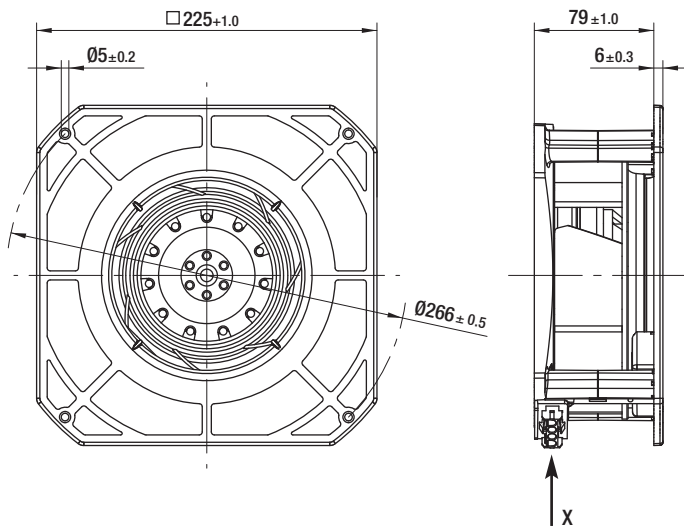
	n [rpm]	P ₁ [W]	I [A]	L _{wA} [dB(A)]
A 1	2400	50	0,45	68
A 2	2320	52	0,46	64
A 3	2270	54	0,47	62
A 4	2415	49	0,43	66
B 1	2600	62	0,55	69
B 2	2440	65	0,57	65
B 3	2360	66	0,57	62
B 4	2610	61	0,53	67
C 1	2500	57	0,26	68
C 2	2415	59	0,26	67
C 3	2375	60	0,26	62
C 4	2515	57	0,25	67
D 1	2700	74	0,33	70
D 2	2565	77	0,34	69
D 3	2505	78	0,35	64
D 4	2720	74	0,33	69

- **Motor protection:** TOP wired internally
- **Connection leads:** Plug system, Cable design on request
- **Protection class:** I
- **Product conforming to standard:** EN 60335-1, CE
- **Approvals:** CCC, GOST



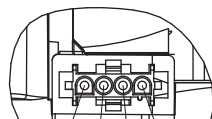
Mass of centrifugal module with support basket

Centrifugal module	kg
K2E 190-A050 -02	1,6
K2E 190-A026 -01	1,6



Coded plug system
 AMP Universal-Mate-N-Lok
 Connector shell: AMP 350 780-1
 4 x Pin connector: AMP 926 886-1
 Mating connector
 (not part of delivery):
 Connector shell: AMP 350 779-4
 4 x female terminal: AMP 926 884-1

View X

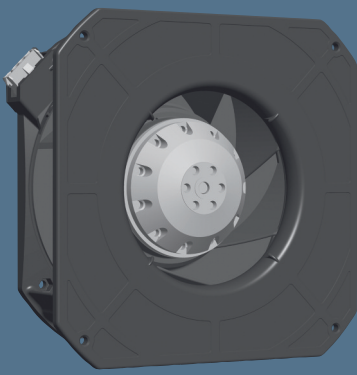


115V:
 1 = Protective earth
 2 = N
 3 = L + capacitor
 4 = Capacitor

230V:
 1 = Protective earth
 2 = N
 3 = L
 4 = Not assigned (capacitor)

AC centrifugal module

backward curved, Ø 220



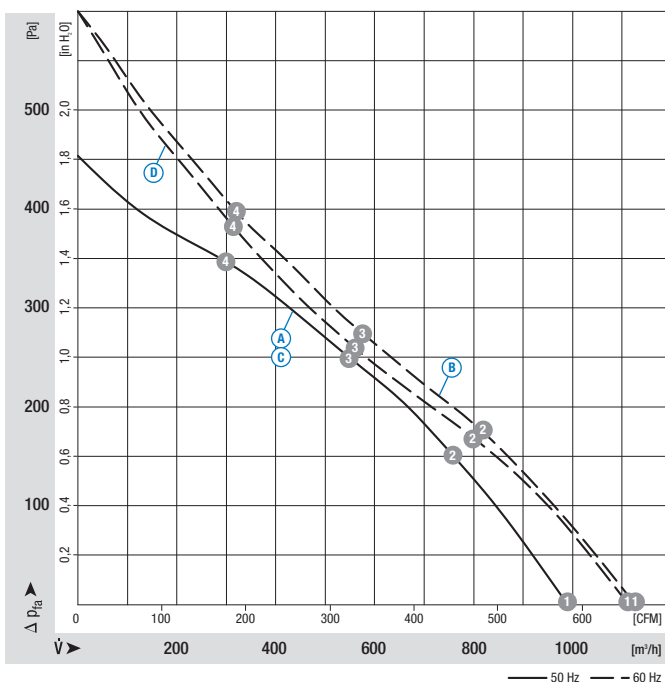
- **Material:** Housing: PA plastic 6, fibreglass-reinforced
Impeller: PA plastic 6, fibreglass-reinforced
Rotor: Coated in black
- **Number of blades:** 11
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 44
- **Insulation class:** "F"
- **Mounting position:** Shaft horizontal or rotor on bottom; rotor on top on request
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data		Curve	Nominal voltage	Frequency	Air flow	Speed/rpm	Power input	Current draw	Capacitor	Sound level	Perm. amb. temp.	Electr. connection
Type	Motor	VAC	Hz	m³/h	rpm	W	A	µF/VDB	dB(A)	°C	p.28	
K2E 220 ⁽¹⁾	M2E 068-CF	(A) 1~	115	50	990	2650	90	0,80	10,0/250	74	-25..+40	A1)
		(B) 1~	115	60	1120	3050	120	1,05	10,0/250	76	-25..+55	
K2E 220 ⁽²⁾	M2E 068-CF	(C) 1~	230	50	990	2700	85	0,38	2,5/400	74	-25..+55	A1)
		(D) 1~	230	60	1110	3050	115	0,51	2,5/400	76	-25..+50	

subject to alterations

⁽¹⁾ external capacitor required; ⁽²⁾ capacitor included

Curves



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

Suction-side noise levels: L_{wA} as per ISO 13347, 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 32 ff.

	n [rpm]	P ₁ [W]	I [A]	L _{wA} [dB(A)]
(A) 1	2650	90	0,80	74
(A) 2	2530	109	0,98	70
(A) 3	2460	117	1,04	67
(A) 4	2540	109	0,98	70
(B) 1	3050	120	1,05	76
(B) 2	2720	146	1,26	71
(B) 3	2555	155	1,34	68
(B) 4	2740	144	1,24	71
(C) 1	2700	85	0,38	74
(C) 2	2515	104	0,46	70
(C) 3	2440	111	0,49	67
(C) 4	2515	102	0,45	70
(D) 1	3050	115	0,51	76
(D) 2	2665	137	0,59	71
(D) 3	2490	145	0,63	68
(D) 4	2670	135	0,59	71

- **Motor protection:** TOP wired internally
- **Connection leads:** Plug system, Cable design on request
- **Protection class:** I
- **Product conforming to standard:** EN 60335-1, CE
- **Approvals:** CCC, GOST



Mass of centrifugal module with support basket

Centrifugal module

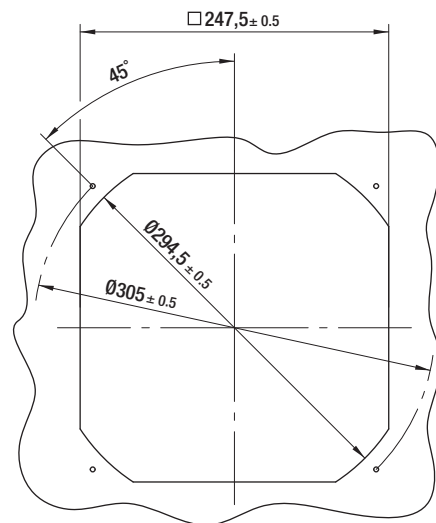
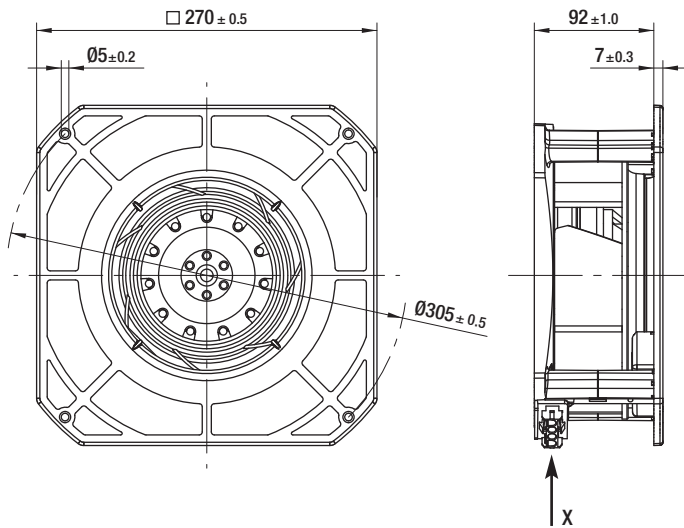
kg

K2E 220-BB08 -02

2,5

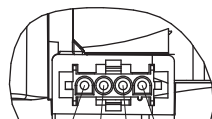
K2E 220-BB06 -01

2,5



Coded plug system
 AMP Universal-Mate-N-Lok
 Connector shell: AMP 350 780-1
 4 x Pin connector: AMP 926 886-1
 Mating connector
 (not part of delivery):
 Connector shell: AMP 350 779-4
 4 x female terminal: AMP 926 884-1

View X



1 2 3 4

115V:

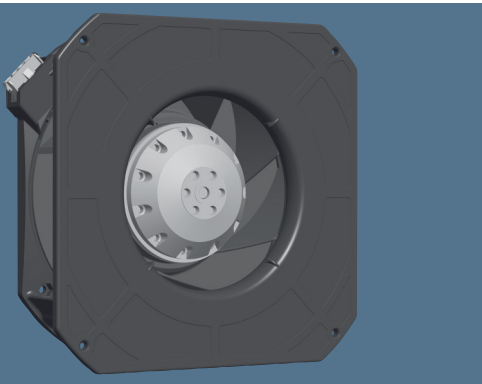
- 1 = Protective earth
- 2 = N
- 3 = L + capacitor
- 4 = Capacitor

230V:

- 1 = Protective earth
- 2 = N
- 3 = L
- 4 = Not assigned (capacitor)

AC centrifugal module

backward curved, Ø 225



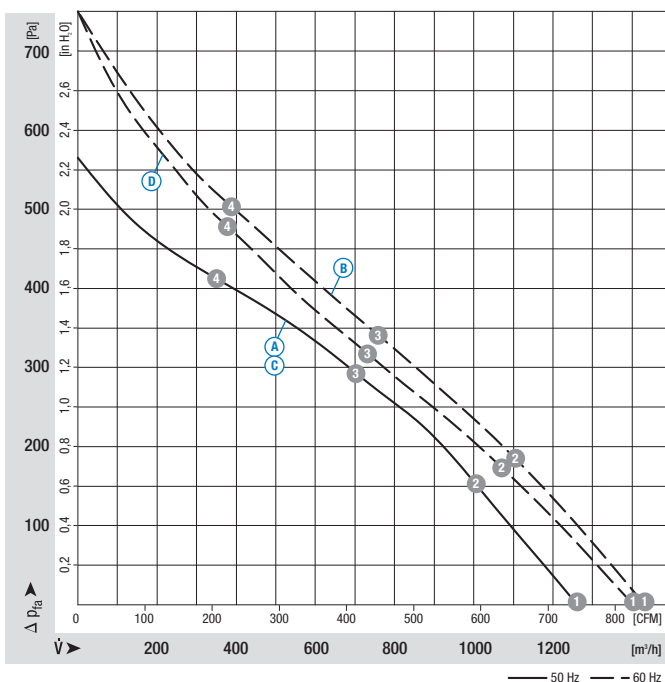
- **Material:** Back of housing: Die-cast aluminium
Front of housing (suction side): PA plastic 6, fibreglass-reinforced
Impeller: PA plastic 6, fibreglass-reinforced
Rotor: Coated in black
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 44
- **Insulation class:** "F"
- **Mounting position:** Shaft horizontal or rotor on bottom; rotor on top on request
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data		Curve	Nominal voltage	Frequency	Air flow	Speed/rpm	Power input	Current draw	Capacitor	Sound level	Perm. amb. temp.	Electr. connection
Type	Motor	VAC	Hz	m³/h	rpm	W	A	µF/VDB	dB(A)	°C	p. 28	
K2E 225 ⁽¹⁾	M2E 068-DF	A 1~	115	50	1260	2650	140	1,25	16,0/250	75	-25..+45	A1)
		B 1~	115	60	1430	3000	195	1,72	16,0/250	78	-25..+55	
K2E 225 ⁽²⁾	M2E 068-DF	C 1~	230	50	1260	2650	135	0,60	4,0/450	75	-25..+55	A1)
		D 1~	230	60	1400	2950	200	0,90	4,0/450	77	-25..+50	

subject to alterations

⁽¹⁾ external capacitor required; ⁽²⁾ capacitor included

Curves



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

Suction-side noise levels: L_{wA} as per ISO 13347, 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 32 ff.

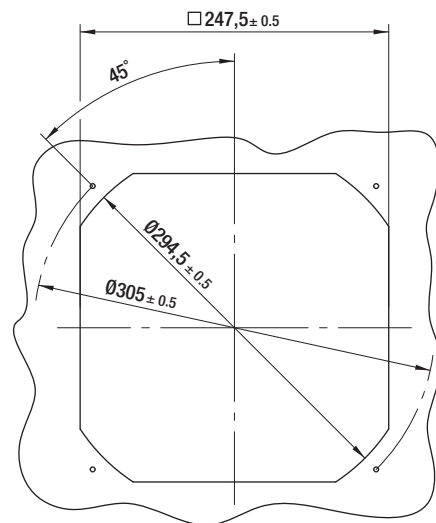
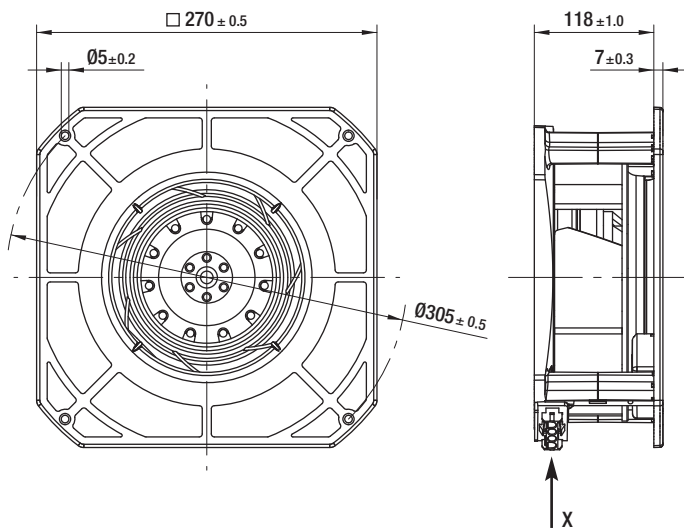
	n [rpm]	P ₁ [W]	I [A]	L _{wA} [dB(A)]
A 1	2650	140	1,25	75
A 2	2620	154	1,37	74
A 3	2565	164	1,46	70
A 4	2650	148	1,33	73
B 1	3000	195	1,72	78
B 2	2885	214	1,86	74
B 3	2755	226	1,97	71
B 4	2925	208	1,81	76
C 1	2650	135	0,60	75
C 2	2600	147	0,64	74
C 3	2545	157	0,68	70
C 4	2620	143	0,62	73
D 1	2950	200	0,90	77
D 2	2790	212	0,93	74
D 3	2660	220	0,96	71
D 4	2825	208	0,91	75

- **Motor protection:** TOP wired internally
- **Connection leads:** Plug system, Cable design on request
- **Protection class:** I
- **Product conforming to standard:** EN 60335-1, CE
- **Approvals:** CCC, GOST



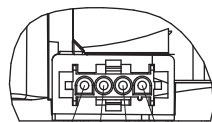
Mass of centrifugal module with support basket

Centrifugal module	kg
K2E 225-AD40 -02	3,1
K2E 225-AD92 -01	3,1



Coded plug system
 AMP Universal-Mate-N-Lok
 Connector shell: AMP 350 780-1
 4 x Pin connector: AMP 926 886-1
 Mating connector
 (not part of delivery):
 Connector shell: AMP 350 779-4
 4 x female terminal: AMP 926 884-1

View X



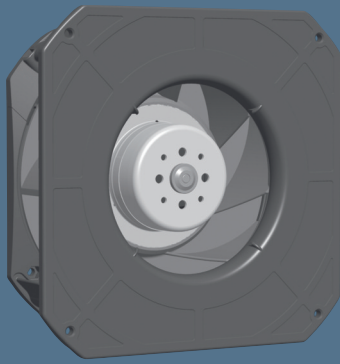
1 2 3 4

115V:
 1 = Protective earth
 2 = N
 3 = L + capacitor
 4 = Capacitor

230V:
 1 = Protective earth
 2 = N
 3 = L
 4 = Not assigned (capacitor)

EC centrifugal module

backward curved, Ø 190



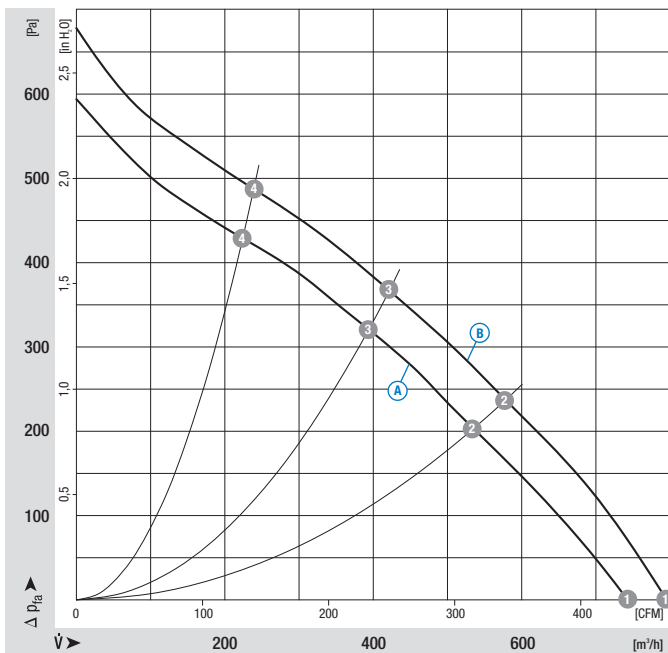
- **Material:** Housing: PA plastic 6, fibreglass-reinforced
Impeller: PA plastic 6, fibreglass-reinforced
Rotor: Galvanised
Electronics enclosure: Die-cast aluminium
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 44
- **Insulation class:** "B"
- **Mounting position:** Any
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data		Curve	Nominal voltage	Frequency	Speed/rpm ⁽¹⁾	Max. power input ⁽¹⁾	Max. current draw ⁽¹⁾	Perm. amb. temp.	Electr. connection
Type	Motor	VAC	Hz	rpm	W	A	°C	p. 29	
K3G 190	M3G 055-CF	A 1~ 115	50/60	3150	85	1,20	-25..+60	H1)	
K3G 190	M3G 055-CF	B 1~ 230	50/60	3395	104	0,75	-25..+60	H1)	

subject to alterations

(1) Nominal data in operating point with maximum load and 115 or 230 VAC

Curves



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

Suction-side noise levels: L_{wA} as per ISO 13347, 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 32 ff.

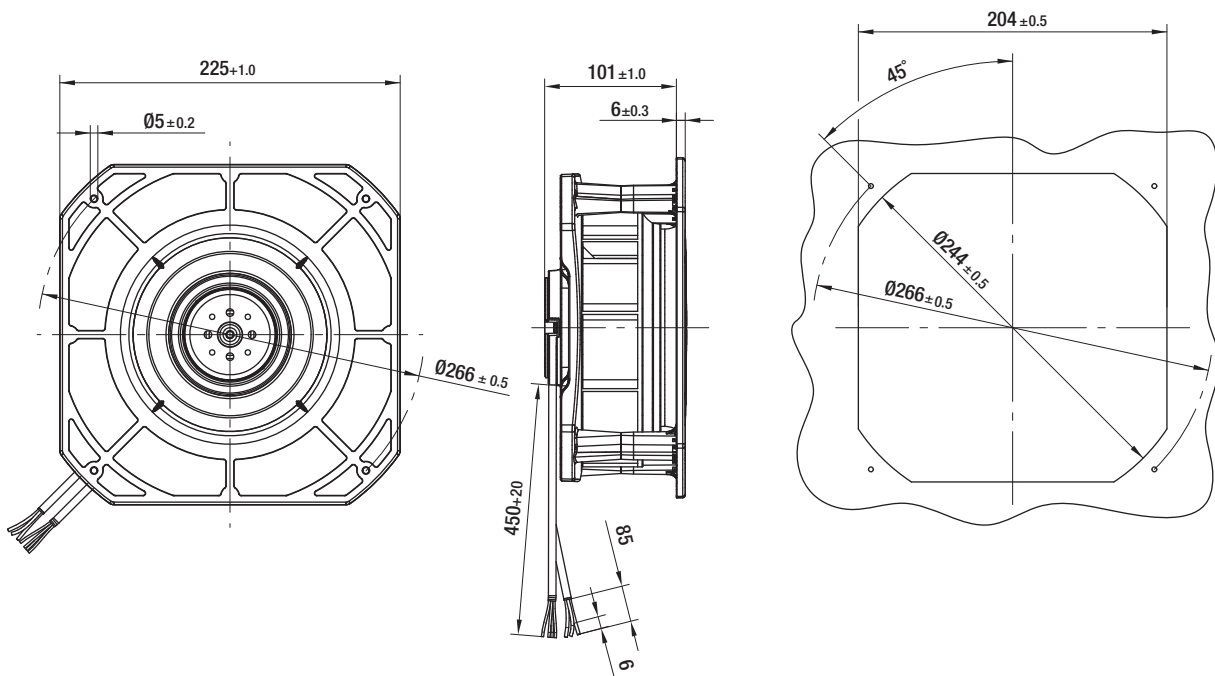
	n [rpm]	P_1 [W]	I [A]	L_{wA} [dB(A)]
A ①	3265	76	1,09	74
A ②	3160	85	1,20	71
A ③	3150	85	1,20	69
A ④	3265	78	1,11	73
B ①	3515	91	0,68	76
B ②	3375	103	0,75	73
B ③	3395	104	0,75	71
B ④	3485	94	0,71	75

- **Technical features:**
 - Control input 0-10 VDC / PWM
 - Output 10 VDC max. 1,1 mA
- **EMC:** Interference emission acc. to EN 61000-6-3
Interference immunity acc. to EN 61000-6-2
Harmonics acc. to DIN EN 61000-3-2/3
- **Leakage current:** < 3.5 mA acc. to EN 60950-1
- **Cable exit:** Variable
- **Protection class:** I
- **Product conforming to standards:** EN 60335-1, CE
- **Approvals:** VDE, UL, CSA, CCC, GOST are applied for
 - Tach output
 - Locked-rotor protection



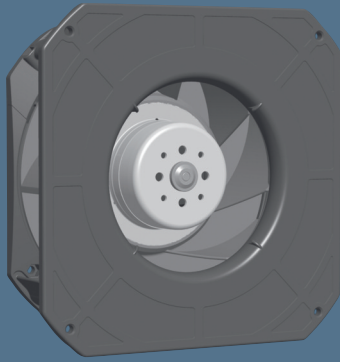
Mass of centrifugal module with support basket

Centrifugal module	kg
K3G 190-CB15 -02	1,7
K3G 190-CB23 -01	1,7



EC centrifugal module

backward curved, Ø 220



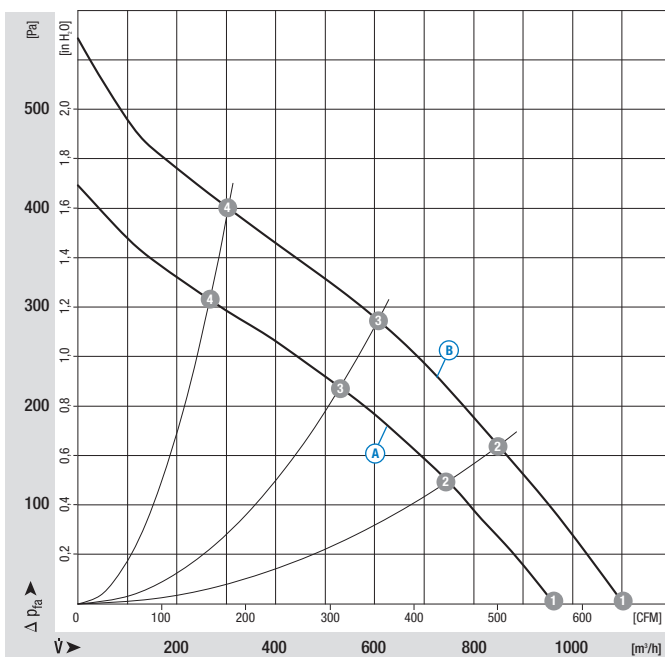
- **Material:** Housing: PA plastic 6, fibreglass-reinforced
Impeller: PA plastic 6, fibreglass-reinforced
Rotor: Galvanised
Electronics enclosure: Die-cast aluminium
- **Number of blades:** 11
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 44
- **Insulation class:** "B"
- **Mounting position:** Any
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data		Curve	Nominal voltage	Frequency	Speed/rpm ⁽¹⁾	Max. power input ⁽¹⁾	Max. current draw ⁽¹⁾	Perm. amb. temp.	Electr. connection
Type	Motor	VAC	Hz	rpm	W	A	°C	p. 29	
K3G 220	M3G 055-CF	A	1~ 115	50/60	2340	75	1,10	-25..+60	H1)
K3G 220	M3G 055-CF	B	1~ 230	50/60	2670	105	0,78	-25..+60	H1)

subject to alterations

(1) Nominal data in operating point with maximum load and 115 or 230 VAC

Curves



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

Suction-side noise levels: L_{wA} as per ISO 13347, 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 32 ff.

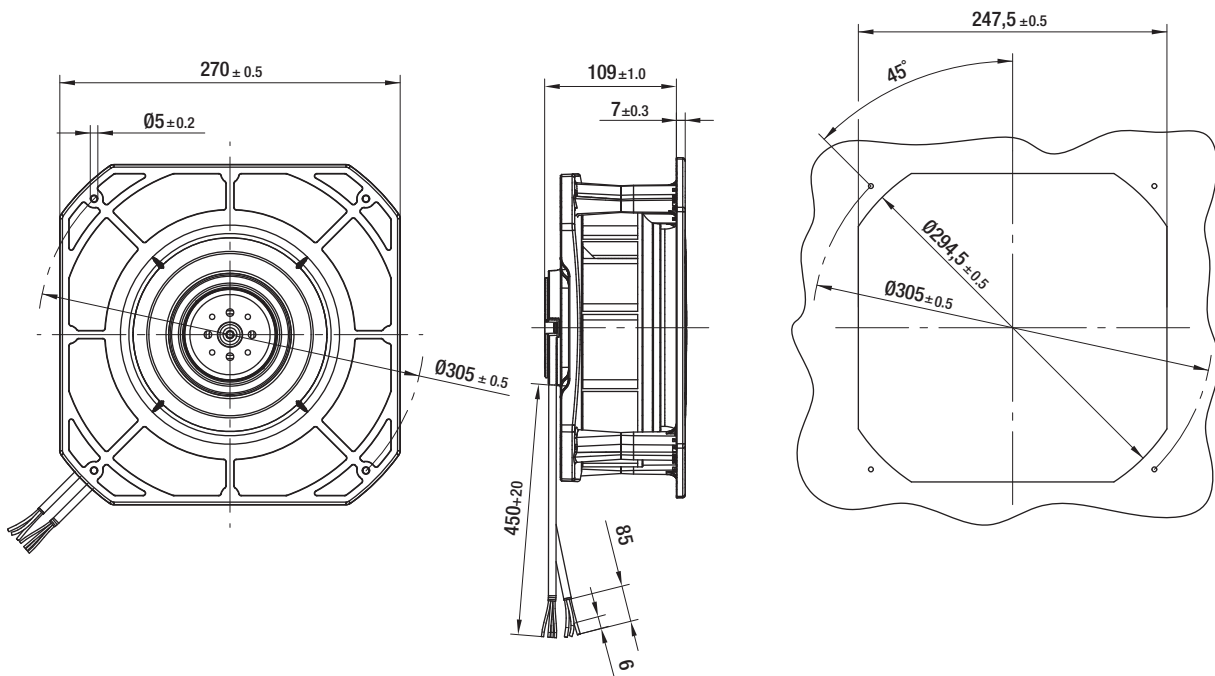
	n [rpm]	P ₁ [W]	I [A]	L _{wA} [dB(A)]
A 1	2600	56	0,82	72
A 2	2435	70	1,03	68
A 3	2340	75	1,10	65
A 4	2420	68	0,99	69
B 1	2990	76	0,56	76
B 2	2780	97	0,71	72
B 3	2670	105	0,78	70
B 4	2720	101	0,75	73

- **Technical features:**
 - Control input 0-10 VDC / PWM
 - Output 10 VDC max. 1,1 mA
- **EMC:** Interference emission acc. to EN 61000-6-3
Interference immunity acc. to EN 61000-6-2
Harmonics acc. to DIN EN 61000-3-2/3
- **Leakage current:** < 3.5 mA acc. to EN 60950-1
- **Cable exit:** Variable
- **Protection class:** I
- **Product conforming to standards:** EN 60335-1, CE
- **Approvals:** VDE, UL, CSA, CCC, GOST are applied for
 - Tach output
 - Locked-rotor protection



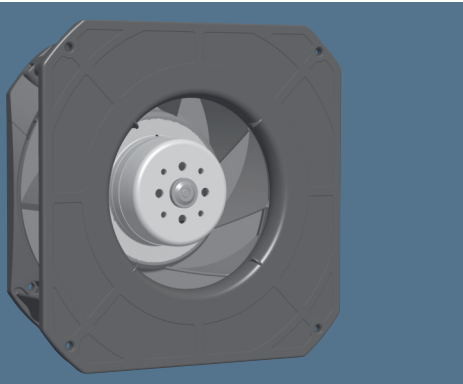
Mass of centrifugal module with support basket

Centrifugal module	kg
K3G 220-CD21 -02	1,8
K3G 220-CD17 -01	1,8



EC centrifugal module

backward curved, Ø 225



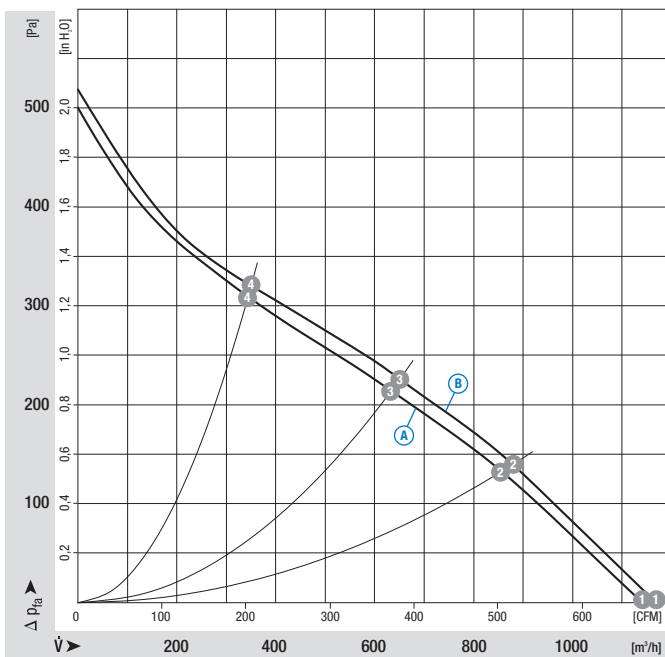
- **Material:** Housing: PA plastic 6, fibreglass-reinforced
Impeller: PA plastic 6.6, fibreglass-reinforced
Rotor: Galvanised
Electronics enclosure: Die-cast aluminium
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 44
- **Insulation class:** "B"
- **Mounting position:** Any
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data		Curve	Nominal voltage	Frequency	Speed/rpm ⁽¹⁾	Max. power input ⁽¹⁾	Max. current draw ⁽¹⁾	Perm. amb. temp.	Electr. connection
Type	Motor	VAC	Hz	rpm	W	A	°C	p. 29	
K3G 225	M3G 055-CF	A 1~ 115	50/60	2185	85	1,23	-25..+60	H1)	
K3G 225	M3G 055-CF	B 1~ 230	50/60	2240	91	0,71	-25..+60	H1)	

subject to alterations

(1) Nominal data in operating point with maximum load and 115 or 230 VAC

Curves



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

Suction-side noise levels: L_{wA} as per ISO 13347, 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 32 ff.

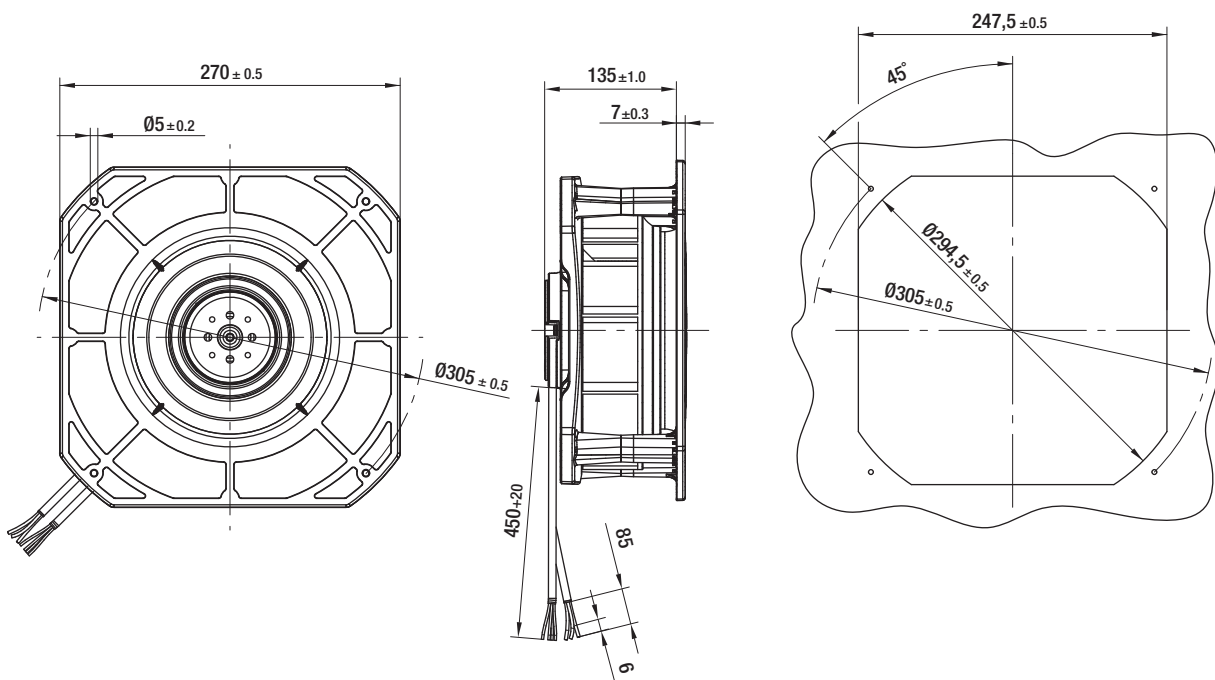
	n [rpm]	P_1 [W]	I [A]	L_{wA} [dB(A)]
A ①	2395	70	1,01	71
A ②	2235	82	1,19	65
A ③	2185	85	1,23	62
A ④	2265	79	1,15	68
B ①	2455	75	0,57	72
B ②	2310	86	0,66	67
B ③	2240	91	0,71	64
B ④	2320	85	0,67	68

- **Technical features:**
 - Control input 0-10 VDC / PWM
 - Output 10 VDC max. 1,1 mA
- **EMC:** Interference emission acc. to EN 61000-6-3
Interference immunity acc. to EN 61000-6-2
Harmonics acc. to DIN EN 61000-3-2/3
- **Leakage current:** < 3.5 mA acc. to EN 60950-1
- **Cable exit:** Variable
- **Protection class:** I
- **Product conforming to standards:** EN 60335-1, CE
- **Approvals:** VDE, UL, CSA, CCC, GOST are applied for
 - Tach output
 - Locked-rotor protection



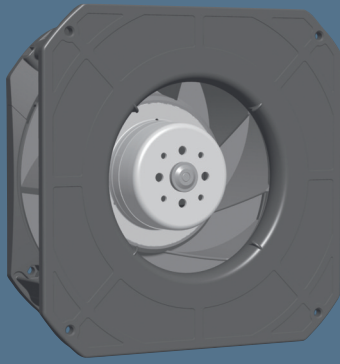
Mass of centrifugal module with support basket

Centrifugal module	kg
K3G 225-CE21 -02	2,1
K3G 225-CE11 -01	2,1



DC centrifugal module

backward curved, Ø 190

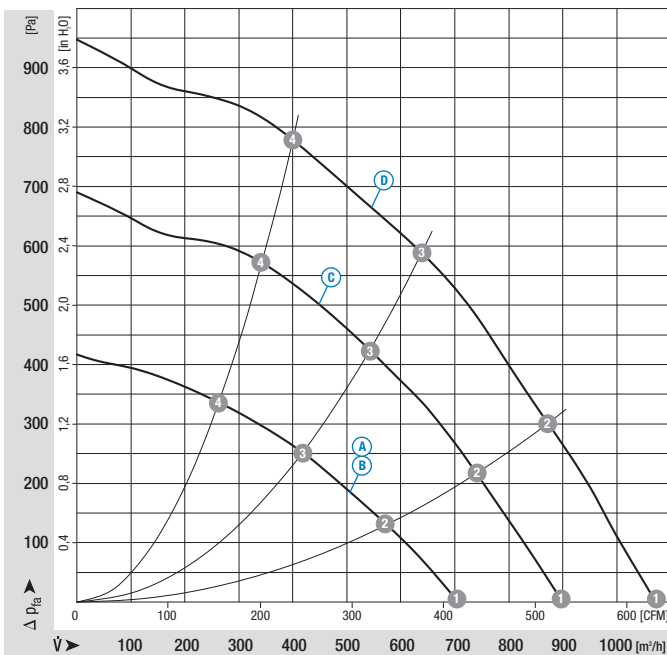


- **Material:** Housing: PA plastic 6, fibreglass-reinforced
Impeller: PA plastic 6.6, fibreglass-reinforced
Rotor: Galvanised
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 20 or IP 66
- **Insulation class:** "E"
- **Mounting position:** Any
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data		Curve	Nominal voltage	Voltage Range	Air flow	Speed/rpm	Power input	Current draw	Sound level	Perm. amb. temp.	Service Life L ₁₀ (40°C) ebm-papst Standard	Service Life L ₁₀ (T _{max}) ebm-papst Standard	Life expectancy L ₁₀ Δ (40°C)	Electr. connection
Type	Motor		VDC	VDC	m ³ /h	rpm	W	A	dB(A)	°C	Hours	Hours		p. 31
RG 190	54.14; 3ph.	A	24	16-30	700	3000	60	2,50	74	-20..+60	55000 / 35000	110000		G2)
RG 190	54.14; 3ph.	A	24	16-30	700	3000	60	2,50	74	-20..+55	55000 / 35000	110000		G2)
RG 190	54.14; 3ph.	B	48	36-57	700	3000	60	1,25	73	-20..+60	55000 / 35000	110000		G2)
RG 190	54.14; 3ph.	B	48	36-57	700	3000	60	1,25	73	-20..+60	55000 / 35000	110000		G2)
RG 190	54.20; 3ph.	C	24	16-36	890	3900	115	4,80	79	-20..+65	52500 / 30500	105000		G2)
RG 190	54.20; 3ph.	D	48	36-72	1080	4600	192	4,00	81	-20..+65	42500 / 22500	80000		G2)

subject to alterations

Curves



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

Suction-side noise levels: L_{wA} as per ISO 13347, L_{pA} measured at 1 m distance to fan axis

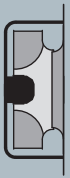
The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

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 32 ff.

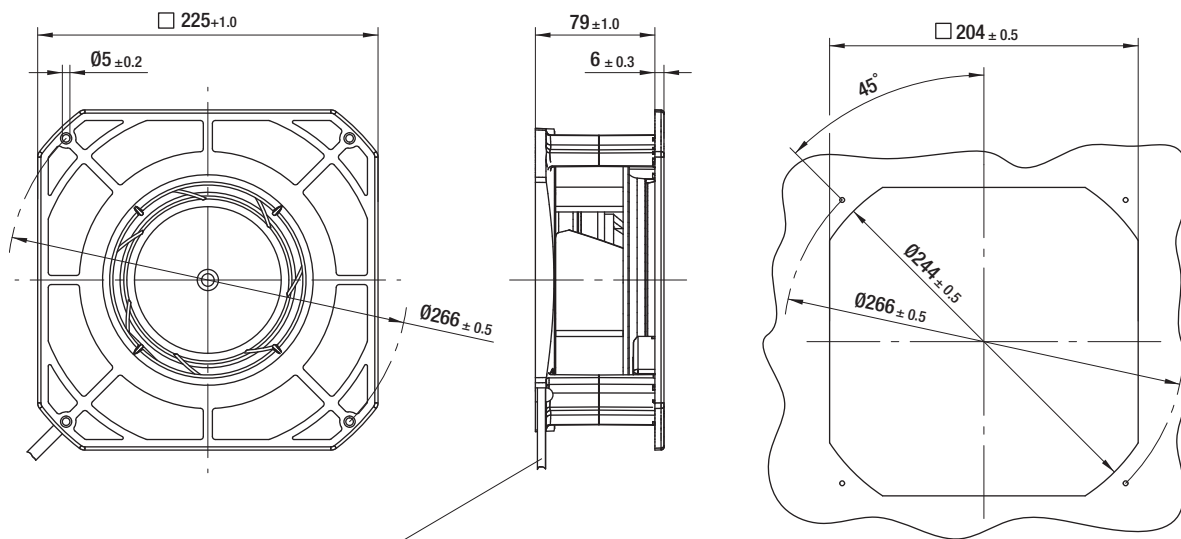
	n [rpm]	P ₁ [W]	I [A]	L _{wA} [dB(A)]
A 1	3000	60	2,50	74
A 2	3040	78	3,31	70
A 3	2970	84	3,59	68
A 4	3015	81	3,44	70
B 1	3000	60	1,25	73
B 2	2995	69	1,47	70
B 3	2990	78	1,66	67
B 4	3045	75	1,59	70
C 1	3900	115	4,80	79
C 2	3955	138	5,79	77
C 3	3895	155	6,51	74
C 4	3960	146	6,10	77
D 1	4600	192	4,00	81
D 2	4610	219	4,61	81
D 3	4540	240	5,05	77
D 4	4645	227	4,77	80

- **Technical features:**
 - Control input 0-10 VDC / PWM
 - Tach output
- **Cable exit:** Variable
 - Reverse polarity and locked-rotor protection
- **Protection class:** A B C III; D I
- **Product conforming to standard:** EN 60950-1, UL 507, C22.2 No.113
- **Approvals:** VDE, UL, CSA are applied for



Mass of centrifugal module with support basket
Type of protection

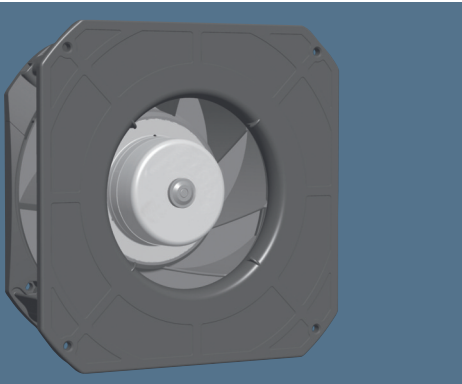
Centrifugal module	kg	IP
RG190-45/14/2TDML0	1,21	20
RG190-45/14/2TDML0U	1,21	66
RG190-45/18/2TDML0	1,21	20
RG190-45/18/2TDML0U	1,21	66
RG190-45/14/2TDM0	1,21	20
RG190-45/18/2TDO	1,21	20



Connection via single stranded wires AWG 20; TR64;
Tach signal and control input AWG22;
Cable length 350 mm as of housing

DC centrifugal module

backward curved, Ø 220

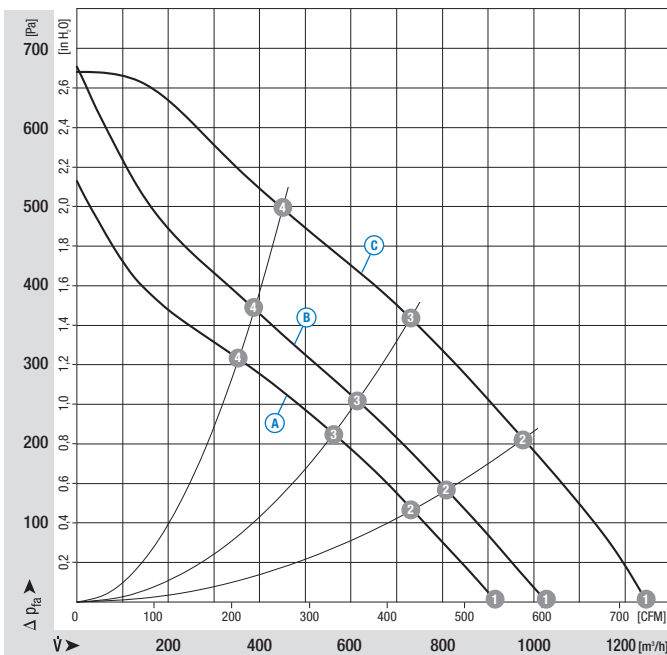


- **Material:** Housing: PA plastic 6, fibreglass-reinforced
Impeller: PA plastic 6.6, fibreglass-reinforced
Rotor: (A) (B) Coated in black; (C) Galvanised
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 20 or IP 42 or IP 44
- **Insulation class:** (A) (B) "B"; (C) "E"
- **Mounting position:** Any
- **Condensate discharges:** (A) (B) None; (C) Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data		Curve	Nominal voltage	Voltage Range	Air flow	Speed/rpm	Power input	Current draw	Sound level	Perm. amb. temp.	Service Life L ₁₀ (40°C) ebm-papst Standard	Service Life L ₁₀ (T _{max}) ebm-papst Standard	Life expectancy L ₁₀ Δ (40°C)	Electr. connection
Type	Motor	VDC	VDC	m³/h	rpm	W	A	dB(A)	°C	Hours	Hours		p. 30/31	
K1G 220	M1G 074-BF	(A)	24	16-28	925	2800	68	3,20	74	-25..+60	95000 / 58000	126000	G1)	
K1G 220	M1G 074-BF	(A)	24	16-28	925	2800	68	3,20	74	-25..+60	95000 / 58000	126000	G1)	
K1G 220	M1G 074-BF	(B)	48	36-57	1025	3100	94	2,30	78	-25..+60	82000 / 43000	111000	G1)	
K1G 220	M1G 074-BF	(B)	48	36-57	1025	3100	94	2,30	78	-25..+60	82000 / 43000	111000	G1)	
RG 220	54.20; 3ph.	(C)	48	36-72	1250	3500	140	2,90	80	-20..+55	55000 / 40000	110000	G2)	

subject to alterations

Curves



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

Suction-side noise levels: L_{wA} as per ISO 13347, 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 32 ff.

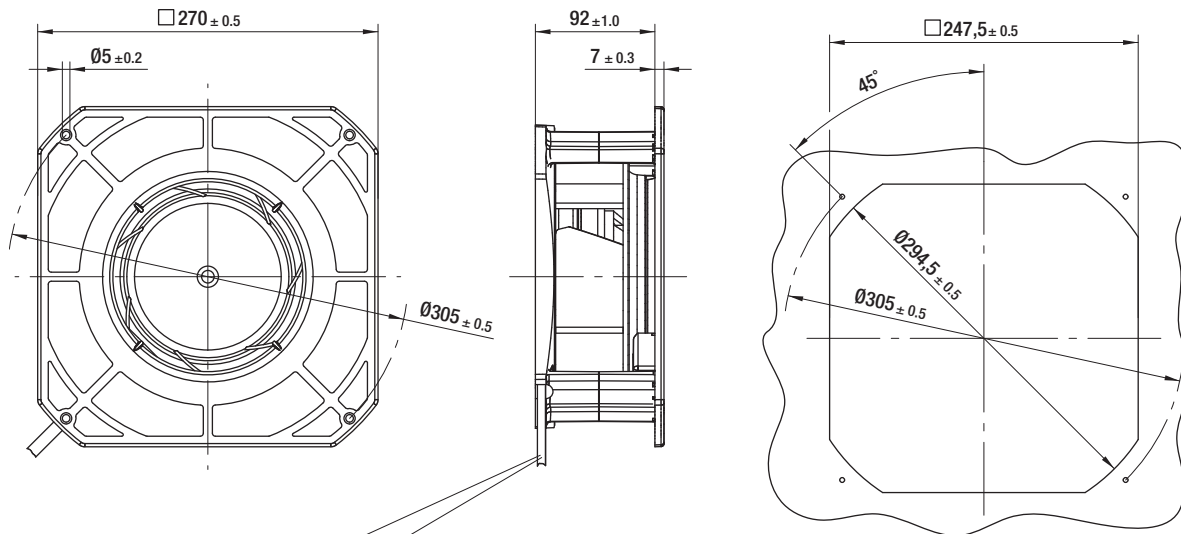
	n [rpm]	P ₁ [W]	I [A]	L _{wA} [dB(A)]
(A) 1	2800	68	3,20	74
(A) 2	2505	74	3,46	71
(A) 3	2430	78	3,63	68
(A) 4	2465	76	3,55	70
(B) 1	3100	94	2,30	78
(B) 2	2770	96	2,35	74
(B) 3	2640	98	2,44	71
(B) 4	2695	97	2,39	71
(C) 1	3500	140	2,90	80
(C) 2	3295	160	3,40	77
(C) 3	3155	171	3,64	77
(C) 4	3215	167	3,55	78

- **Technical features:**
 - Control input 0-10 VDC / PWM
 - Tach output
 - Reverse polarity and locked-rotor protection
- **EMC:**
 - Ⓐ Ⓑ Interference emission acc. to EN 61000-6-3
 - Ⓐ Ⓑ Interference immunity acc. to EN 61000-6-2
- **Cable exit:** Variable
- **Protection class:** I
- **Product conforming to standard:** EN 60950-1
- **Approvals:** VDE, UL, CSA, CCC are applied for



Mass of centrifugal module with support basket
Type of protection

Centrifugal module	kg	IP
K1G 220-AA89 -02	2,35	42
K1G 220-AA89 -04	2,35	44
K1G 220-AA67 -02	2,35	42
K1G 220-AA67 -04	2,35	44
RG220-44/18/2TD0	1,87	20

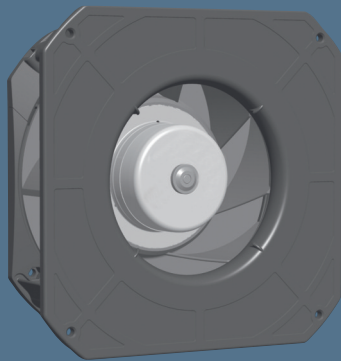


RG: Connection via single stranded wires AWG 20; TR64;
Tach signal and control input AWG22;
Cable length 350 mm as of housing

K1G: Cable length 350 mm as of housing, insulation stripped for 85 mm;
brass lead tips attached

DC centrifugal module

backward curved, Ø 225



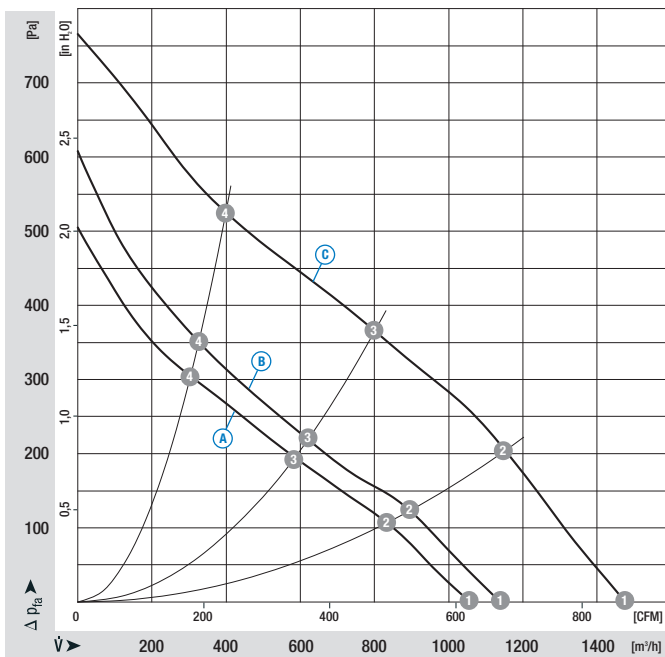
- **Material:** Housing: PA plastic 6, fibreglass-reinforced
Impeller: PA plastic 6.6, fibreglass-reinforced
Rotor: (A) (B) Coated in black; (C) Galvanised
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 20 or IP 42 or IP 44
- **Insulation class:** (A) (B) "B"; (C) "E"
- **Mounting position:** Any
- **Condensate discharges:** (A) (B) None; (C) Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data		Curve	Nominal voltage	Voltage Range	Air flow	Speed/rpm	Power input	Current draw	Sound level	Perm. amb. temp.	Service Life L ₁₀ (40°C) ebm-papst Standard	Service Life L ₁₀ (T _{max}) ebm-papst Standard	Life expectancy L ₁₀ Δ (40°C)	Electr. connection
Type	Motor	VDC	VDC	m³/h	rpm	W	A	dB(A)	°C	Hours	Hours		p. 30/31	
K1G 225	M1G 074-BF	(A)	24	16-28	1080	2370	72	3,40	72	-25..+60	100000 / 60000	130000	G1)	
K1G 225	M1G 074-BF	(A)	24	16-28	1080	2370	72	3,40	72	-25..+60	100000 / 60000	130000	G1)	
K1G 225	M1G 074-BF	(B)	48	36-57	1140	2500	83	2,00	74	-25..+60	96000 / 56000	130000	G1)	
K1G 225	M1G 074-BF	(B)	48	36-57	1140	2500	83	2,00	74	-25..+60	96000 / 56000	130000	G1)	
RG 225	54.20; 3ph.	(C)	48	36-72	1480	3100	163	3,40	78	-20..+55	46000* / 34000*	92000*	G2)	

subject to alterations

* Preliminary Service Life

Curves



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

Suction-side noise levels: L_{wA} as per ISO 13347, L_{pA} measured at 1 m distance to fan axis

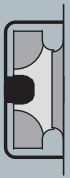
The acoustic values given are only valid under the measurement conditions listed and may vary depending on the installation situation.

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 32 ff.

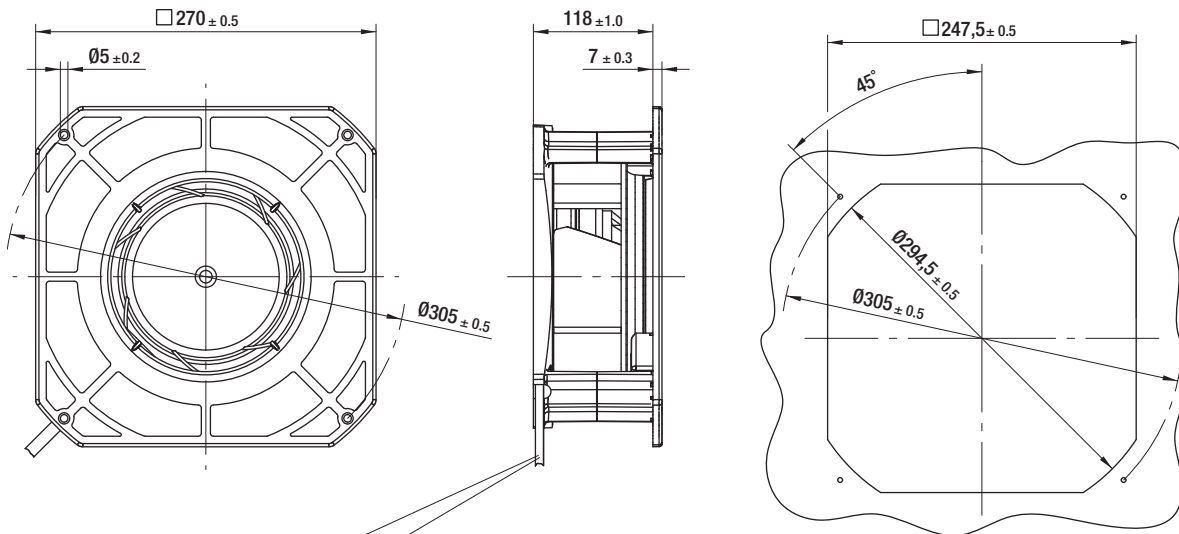
	n [rpm]	P ₁ [W]	I [A]	L _{wA} [dB(A)]
(A) 1	2370	72	3,40	72
(A) 2	2240	74	3,44	68
(A) 3	2170	75	3,55	67
(A) 4	2300	71	3,32	69
(B) 1	2500	83	2,00	74
(B) 2	2385	87	2,10	70
(B) 3	2290	88	2,16	68
(B) 4	2450	85	2,05	72
(C) 1	3100	163	3,40	78
(C) 2	2960	171	3,67	75
(C) 3	2835	181	3,91	73
(C) 4	2975	170	3,66	77

- **Technical features:**
 - Control input 0-10 VDC / PWM
 - Tach output
 - Reverse polarity and locked-rotor protection
- **EMC:** **A** **B** Interference emission acc. to EN 61000-6-3
- A** **B** Interference immunity acc. to EN 61000-6-2
- **Cable exit:** Variable
- **Protection class:** I
- **Product conforming to standard:** EN 60950-1
- **Approvals:** VDE, UL, CSA, CCC are applied for



Mass of centrifugal module with support basket
Type of protection

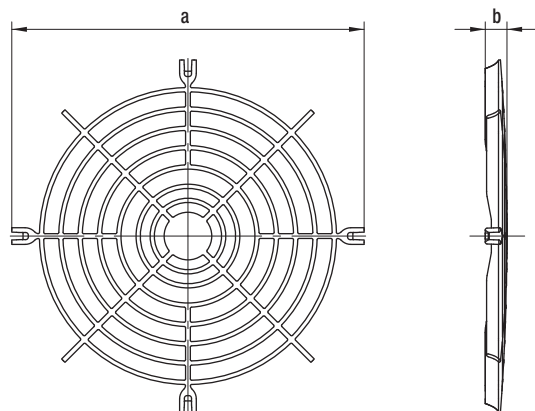
Centrifugal module	kg	IP
K1G 225-AC49 -02	2,45	42
K1G 225-AC49 -04	2,45	44
K1G 225-AC39 -02	2,45	42
K1G 225-AC39 -04	2,45	44
RG225-63/18/2TD0	2,03	20



RG: Connection via single stranded wires AWG 20; TR64;
Tach signal and control input AWG22;
Cable length 350 mm as of housing

K1G: Cable length 350 mm as of housing, insulation stripped for 85 mm;
brass lead tips attached

Guard grille



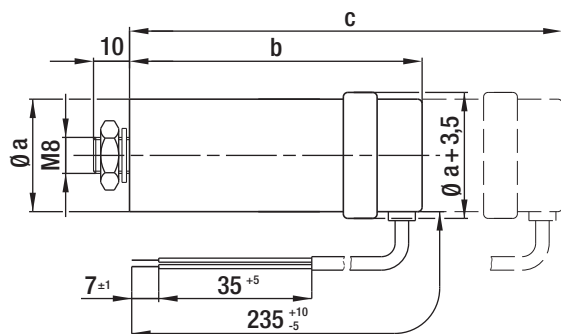
– **Material:** PA plastic 6, fibreglass-reinforced

Guard grille for suction side for compact centrifugal modules

Part no.	Size	a	b
19050-2-2929	190	133,0	9,0
22050-2-2929	220	166,0	8,7
22550-2-2929	225	158,0	8,7

subject to alterations

Capacitors

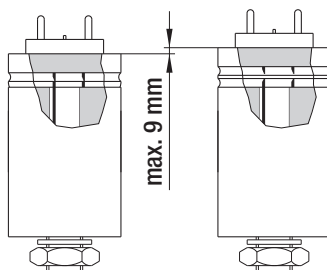


- **Material:** Plastic cap, aluminium cup
- **Designation:** FPU or P2 according to IEC 252 (non-flammable, non-explosive, circuit-breaking)
- **Approval:** VDE according to DIN EN 60252 (VDE 0560/8)
- **Calculated life time:**
 420 V; -25 to +85°C; 30,000 hrs; class A
 470 V; -25 to +85°C; 10,000 hrs; class B
 500 V; -25 to +85°C; 3,000 hrs; class C

MKP motor capacitors FPU or P2 (with fuse)

Part no.	Capacity	a	b (max.)	c (max.)
02162-4-7320	5,0 μ F	25-30	104,0	113,0
02163-4-7320	6,0 μ F	30,0	101,0	110,0
02166-4-7320	10,0 μ F	35,0	96,0	110,0
02168-4-7320	16,0 μ F	40,0	96,0	130,0

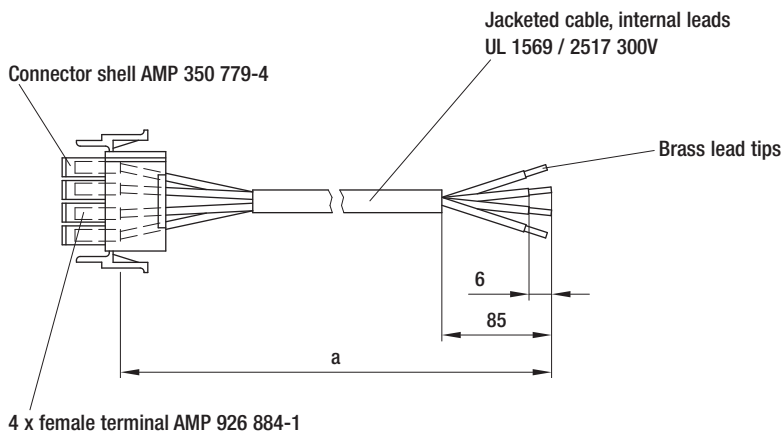
subject to alterations



- **Pull-off protector:** The housing expands by max. 9 mm. The protector responds to overload by the generated excess pressure snapping off the internal lead in a predetermined breaking point.
- **Mounting:** c is the overall dimension of the capacitor which has to be taken into account when mounting the part. The capacitor design, however, depends on the manufacturer. The expansion (9 mm) is either added to dimension b, or it is already integrated in the capacitor.

Connection leads

115 V (UL)



– Plug assignment:

- 1 = green/ yellow
- 2 = blue
- 3 = black
- 4 = brown

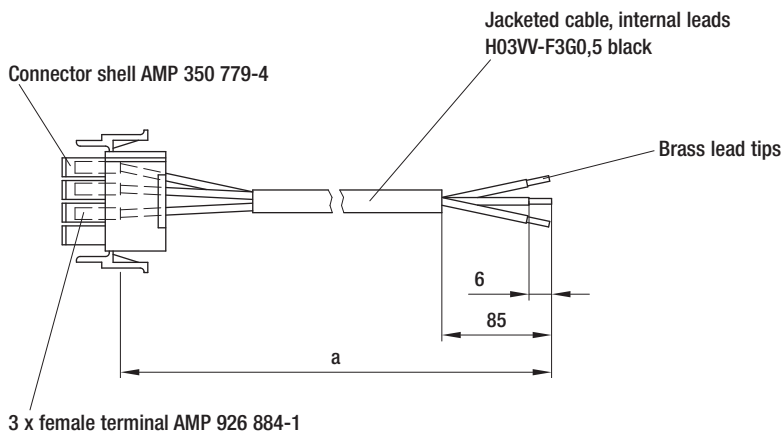
Lead connections for AC centrifugal modules (115 V)

Part no.	a
11530-4-1029	450,0
11531-4-1029	1000,0
11532-4-1029	1300,0
11533-4-1029	1600,0
11534-4-1029	2300,0

subject to alterations

Connection leads

230 V



- Plug assignment:

- 1 = green/ yellow
- 2 = blue
- 3 = brown
- 4 = not assigned

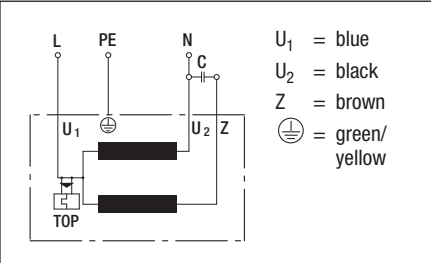
Lead connections for AC centrifugal modules (230 V)

Part no.	a
23030-4-1012	450,0
23031-4-1012	1000,0
23032-4-1012	1300,0
23033-4-1012	1600,0
23034-4-1012	2300,0

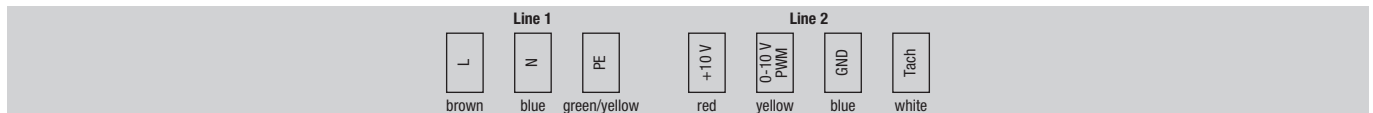
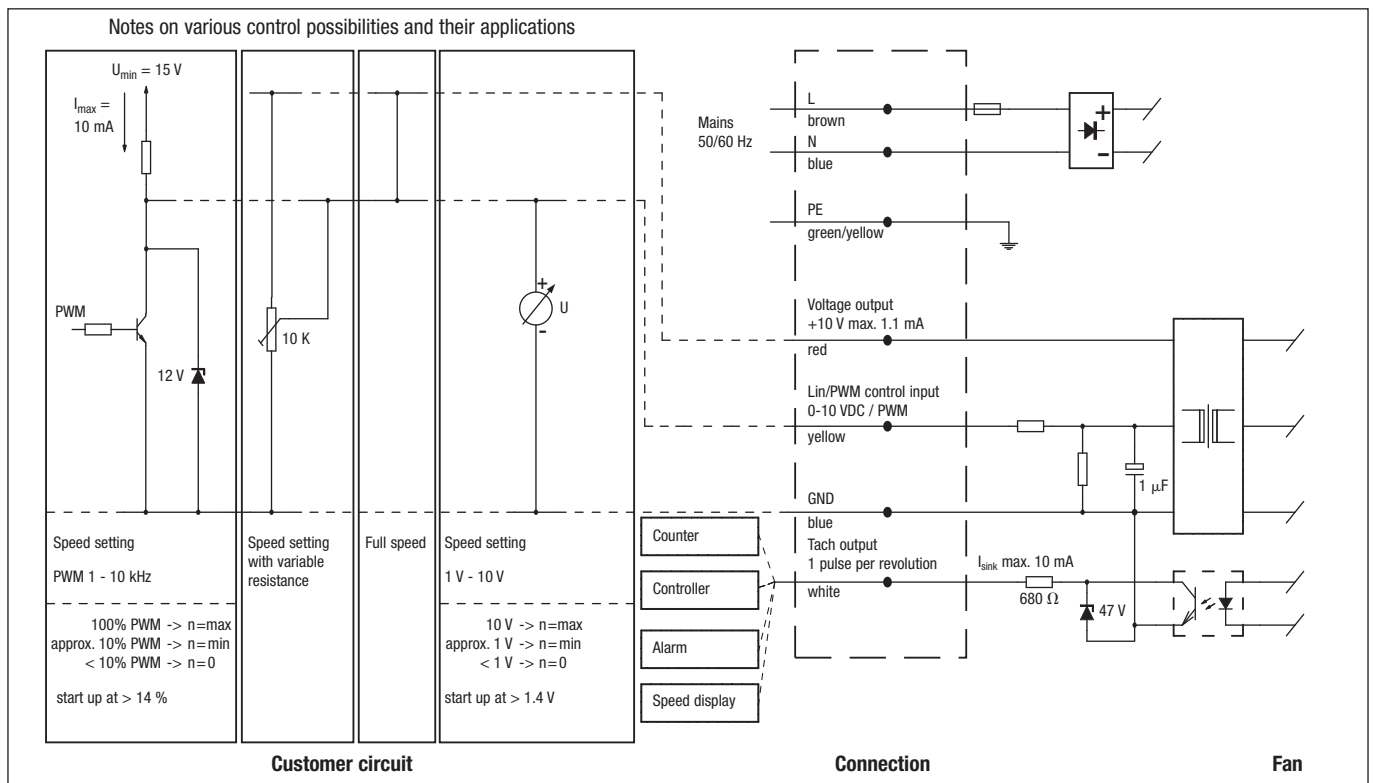
subject to alterations

Electrical connections

A1) Single-phase capacitor motor
with TOP wired internally



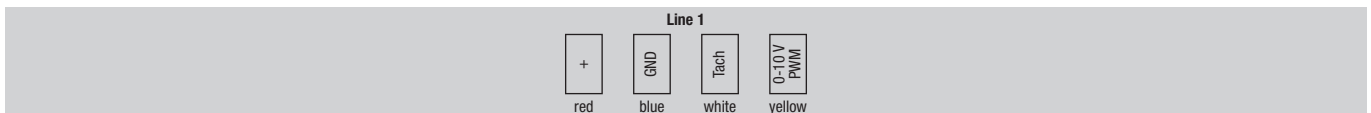
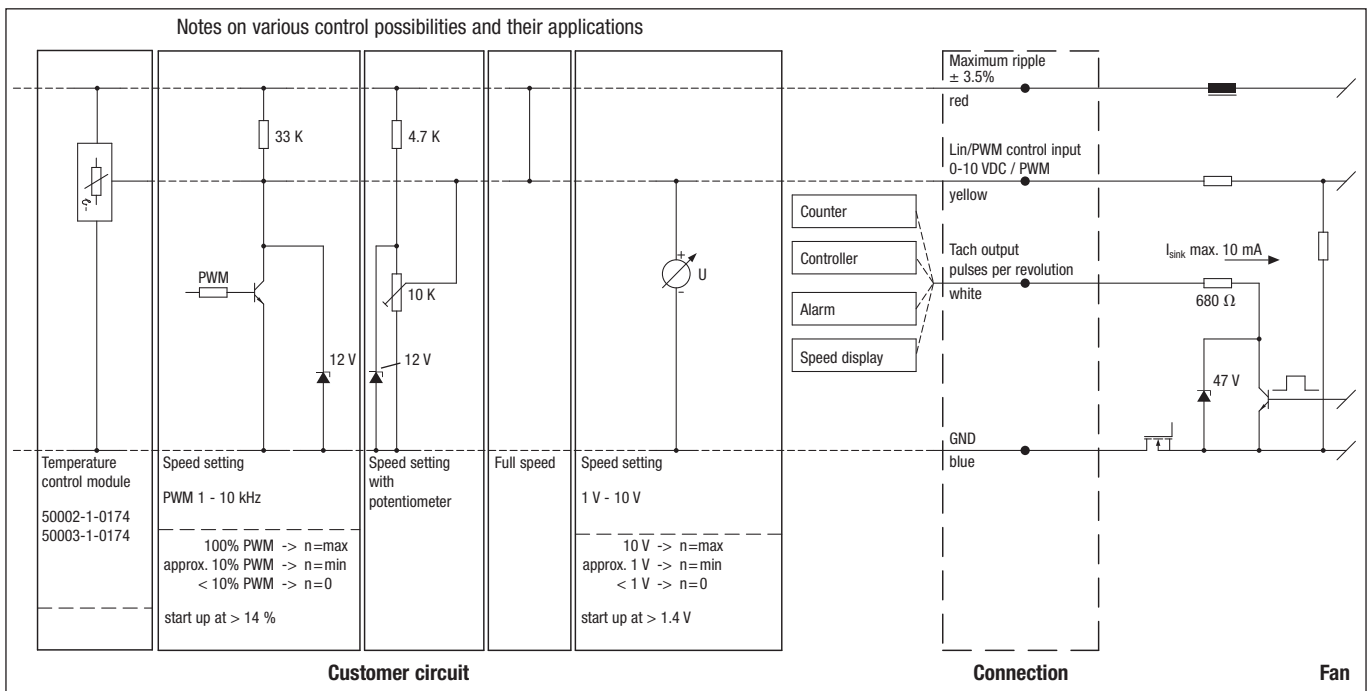
H1)



Line	Connection	Colour	Assignment / function	Line	Connection	Colour	Assignment / function
1	L	brown	Mains 50/60 Hz, phase	2	+10 V	red	Voltage output +10 V max. 1.1 mA
	N	blue	Mains 50/60 Hz, neutral		0-10 V / PWM	yellow	Control input (Impedance 100 k Ω)
	PE	green/yel	Protective earth		GND	blue	GND
					Tach	white	Tach output: 1 pulse per revolution

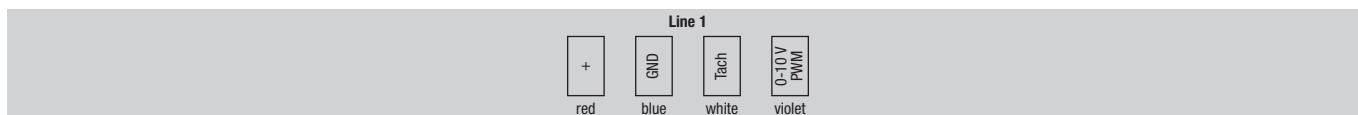
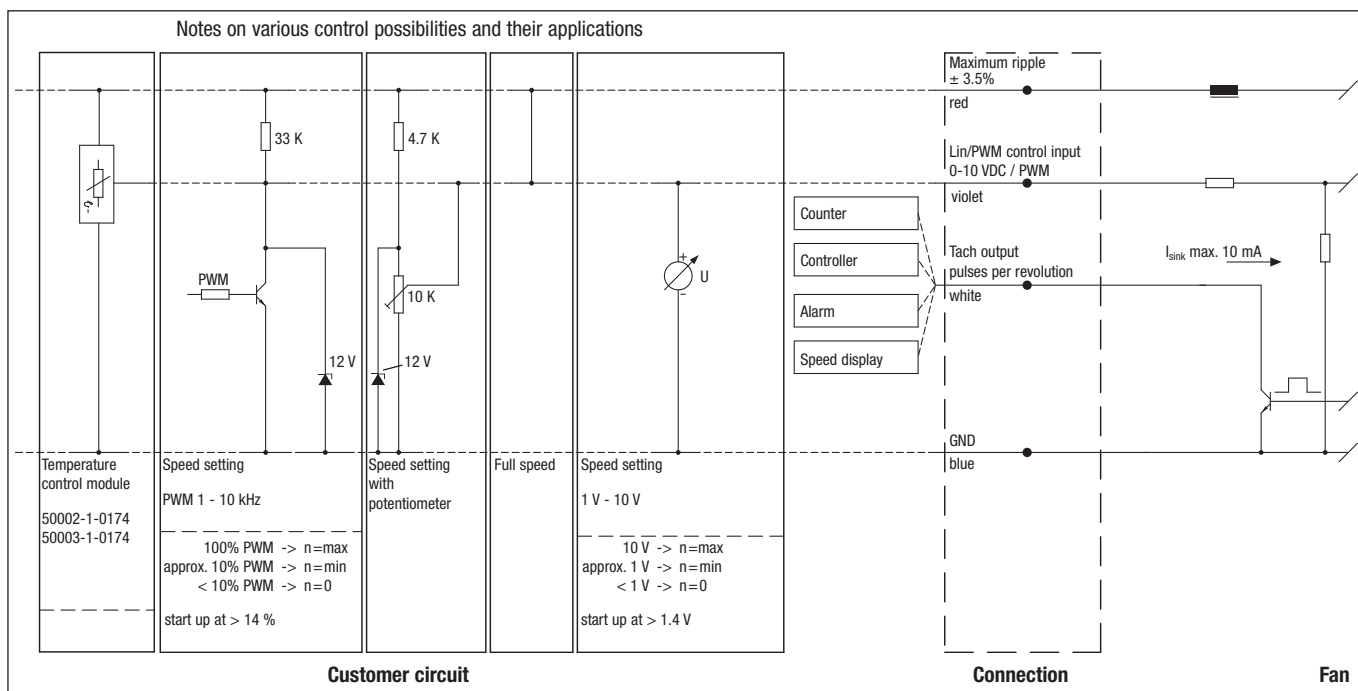
Electrical connections

G1)



Line	Connection	Colour	Assignment / function	Line	Connection	Colour	Assignment / function
1	+	red	Maximum ripple $\pm 3.5\%$	1	Tach	white	Tach output: 3 pulses / revolution
	GND	blue	GND				
					0-10 V / PWM	yellow	Control input (Impedance 100 k Ω)

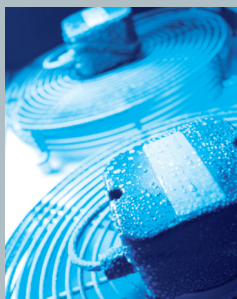
G2)



Line	Connection	Colour	Assignment / function
1	+	red	Maximum ripple ± 3.5 %
	GND	blue	GND

Line	Connection	Colour	Assignment / function
1	Tach	white	Tach output: 3 pulses / revolution
	0-10 V / PWM	violet	Control input (Impedance 100 kΩ)

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 products depends on two major factors:

- The service life of the insulation system
- The service life of the bearing system

The service life of the insulation system mainly depends on voltage level, temperature and ambient conditions, such as humidity and condensation.

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. As an option, sleeve bearings can be used, which is indicated on the product-specific data sheet wherever applicable.

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.

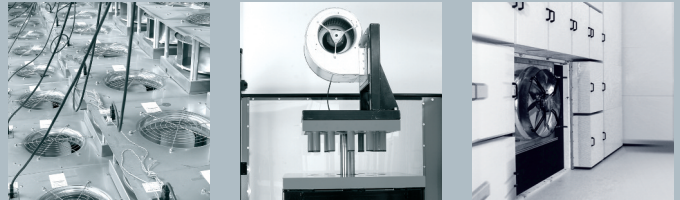
Depending on motor type and field of application, the following protective features are realised:

- Thermal overload protection (TOP), either in-circuit or external
- PTC with electronic diagnostics
- Impedance protection
- Thermal overload protection (TOP) with electronic diagnostics
- Current limitation via electronics

If an external TOP is connected, the customer has to make sure to connect a conventional trigger device for switching it off.

Products without fitted TOP and without protection against improper use, a motor protection complying with the valid standards has to be installed.

*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.

Leakage current

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

Measuring is according to IEC 60990.

Approvals

In case you require a specific approval for your ebm-papst product (VDE, UL, GOST, CCC, CSA, etc.) please let us know.

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

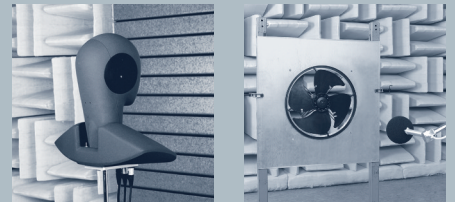
Information on existing approvals is provided in the product-specific data sheets.

■ 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 level (L_w), 10 microphones are distributed over an enveloping surface on the intake side of the fan being tested (see graphic). The sound level measured can be roughly calculated from the sound pressure level by adding 7 dB.

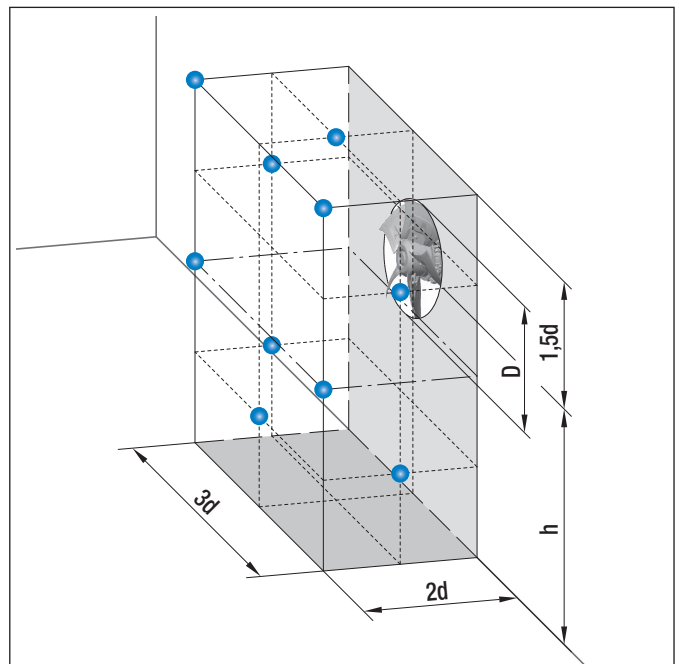
Measuring configuration as per ISO 13347-3 respectively DIN 45635-38:

- 10 measuring points

$$d \geq D$$

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

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

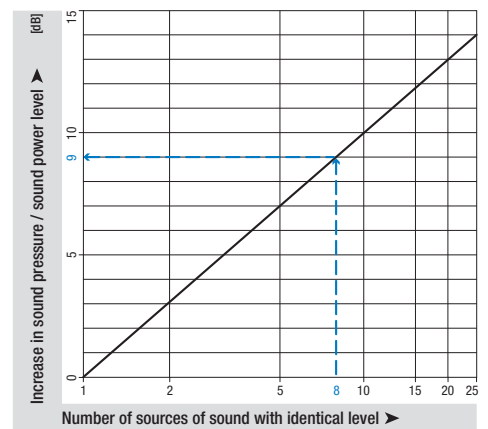


Adding multiple noise sources with the same level

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.

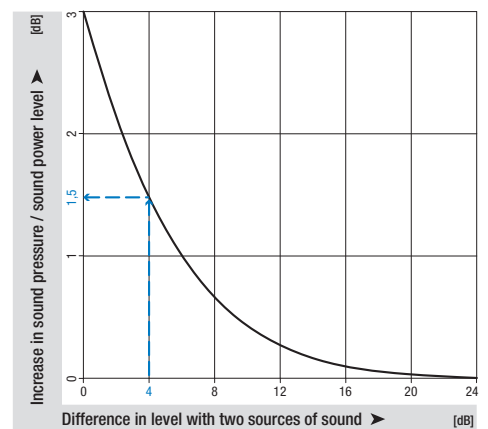
Example: 8 A3G800 axial fans are on a condenser. According to the data sheet, the sound pressure level of a fan is approximately 75 dB(A). The level increase measured from the diagram is 9 dB. Thus the overall sound level of the installation can be expected to be 84 dB(A).



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.

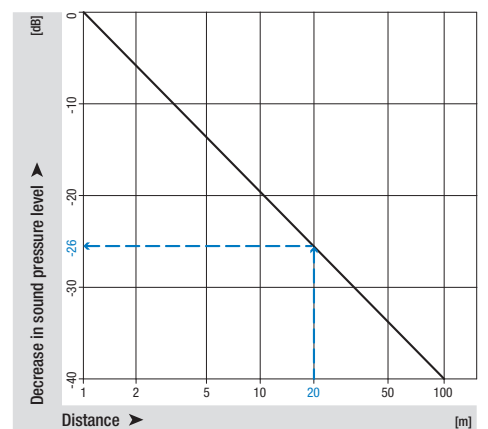
Example: There is an axial fan A3G800 with a sound pressure level of 75 dB(A) at the operating point and an axial fan A3G710 with 71 dB(A) in a ventilation unit. The level difference is 4 dB. The level increase can now be read in the diagram as approx. 1.5 dB. This means that the overall sound level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

Germany

ebm-papst Muldingen GmbH & Co. KG

Bachmühle 2
D-74673 Muldingen
Phone +49 7938 81-0
Fax +49 7938 81-110
info1@de.ebmpapst.com

www.ebmpapst.com

ebm-papst St. Georgen GmbH & Co. KG

Hermann-Papst-Straße 1
D-78112 St. Georgen
Phone +49 7724 81-0
Fax +49 7724 81-1309
info2@de.ebmpapst.com

www.ebmpapst.com

ebm-papst Landshut GmbH

Hofmark-Aich-Straße 25
D-84030 Landshut
Phone +49 871 707-0
Fax +49 871 707-465
info3@de.ebmpapst.com

www.ebmpapst.com

Agencies

-  **Berlin**
 Dipl.-Ing. (TH) Jens Duchow
 Händelstraße 7
 D-16341 Panketal
Phone +49 30 944149-62
Fax +49 30 944149-63
Jens.Duchow@de.ebmpapst.com
-  **Bielefeld**
 Dipl.-Ing. (FH) Wolf-Jürgen Weber
 Niehausweg 13
 D-33739 Bielefeld
Phone +49 5206 91732-31
Fax +49 5206 91732-35
Wolf-Juergen.Weber@de.ebmpapst.com
-  **Dortmund**
 Dipl.-Ing. (FH) Hans-Joachim Pundt
 Auf den Steinern 3
 D-59519 Möhnese-see-Völlinghausen
Phone +49 2925 800-407
Fax +49 2925 800-408
Hans-Joachim.Pundt@de.ebmpapst.com
-  **Frankfurt**
 Dipl.-Ing. Christian Kleffmann
 Dr.-Hermann-Krause-Straße 23
 D-63452 Hanau
Phone +49 6181 1898-12
Fax +49 6181 1898-13
Christian.Kleffmann@de.ebmpapst.com
-  **Halle**
 Dipl.-Ing. (TU) Michael Hanning
 Lerchenweg 4
 D-06120 Lieskau
Phone +49 345 55124-56
Fax +49 345 55124-57
Michael.Hanning@de.ebmpapst.com
-  **Hamburg**
 Ingenieurbüro Breuell GmbH
 Ing. Dirk Kahl
 Elektroingenieur
Grützmühlenweg 40
D-22339 Hamburg
Phone +49 40 538092-19
Fax +49 40 538092-84
Dirk.Kahl@de.ebmpapst.com

-  **Kassel**
 Dipl.-Ing. (FH) Ralph Brück
 Hoherainstraße 3 b
 D-35075 Gladenbach
Phone +49 6462 4071-10
Fax +49 6462 4071-11
Ralph.Brueck@de.ebmpapst.com
-  **Koblenz**
 Winfried Schaefer
 Hinter der Kirch 10
 D-56767 Uersfeld
Phone +49 2657 16-96
Fax +49 2657 16-76
Winfried.Schaefer@de.ebmpapst.com
-  **Munich**
 Dipl.-Wirt.-Ing. (FH) Jens Peter
 Uhlandstraße 6
 D-74427 Fichtenberg
Phone +49 7971 260-180
Fax +49 7971 260-221
Jens.Peter@de.ebmpapst.com
-  **Nuremberg**
 Friedrich Klein
 Adlerstraße 49/1
 D-73540 Heubach
Phone +49 7173 4983
Fax +49 7173 8053
Friedrich.Klein@de.ebmpapst.com
-  **Offenburg**
 Dipl.-Ing. (FH) Ralf Braun
 Hubeneck 21
 D-77704 Oberkirch
Phone +49 7802 9822-52
Fax +49 7802 9822-53
Ralf.Braun@de.ebmpapst.com
-  **Stuttgart**
 Dipl.-Ing. (FH) Rudi Weinmann
 Hindenburgstraße 100/1
 D-73207 Plochingen
Phone +49 7153 9289-80
Fax +49 7153 9289-81
Rudi.Weinmann@de.ebmpapst.com
-  **Ulm**
 Dipl.-Wirt.-Ing. (FH) Axel Resch
 Bachmühle 2
 D-74673 Muldingen
Phone +49 7938 81-7092
Fax +49 7938 81-110
Axel.Resch@de.ebmpapst.com

Distributors

-  **Frankfurt**
R.E.D. Handelsgesellschaft mbH
Gutenbergstraße 3
D-63110 Rodgau - Jügesheim
Phone +49 6106 841-0
Fax +49 6106 841-111
info@red-elektromechanik.de
www.red-elektromechanik.de
-  **Hamburg**
Breuell + Hilgenfeldt GmbH
Grützmühlenweg 40
D-22339 Hamburg
Phone +49 40 538092-20
Fax +49 40 538092-84
info@breuell-hilgenfeldt.de
-  **Munich**
A. Schweiger GmbH
Ohmstraße 1
D-82054 Sauerlach
Phone +49 8104 897-0
Fax +49 8104 897-90
info@schweiger-gmbh.de
www.schweiger-gmbh.com
- **Express Service-Center** (1 to 5 pieces)
-  **North**
 Breuell + Hilgenfeldt GmbH
 Grützmühlenweg 40
 D-22339 Hamburg
Phone +49 40 538092-20
Fax +49 40 538092-84
ebmpapst@breuell-hilgenfeldt.de
-  **South**
 HDS Ventilatoren Vertriebs GmbH
 Glaswiesenstraße 1
 D-74677 Dörzbach
Phone +49 7937 8033520
Fax +49 7937 8033525
info@hds-gmbh.net

Europe

 **Austria**
 ebm-papst Motoren & Ventilatoren GmbH
 Straubingstraße 17
A-4030 Linz
Phone +43 732 321150-0
Fax +43 732 321150-20
info@at.ebmpapst.com
www.ebmpapst.at

 **Belarus**
 ebm-papst Bel AgmbH
 P.O. Box 117
BY-220138 Minsk
Phone +375 17 3851556
Fax +375 17 3851556
info@by.ebmpapst.com
www.ebmpapst.by

 **Belgium**
 ebm-papst Benelux B.V.
 Sales office Belgium-Luxemburg
Romeinsestraat 6/0101
Research Park Haasrode
B-3001 Heverlee-Leuven
Phone +32 16 396-200
Fax +32 16 396-220
info@be.ebmpapst.com
www.ebmpapst.be

 **Bulgaria**
 ebm-papst Romania S.R.L.
 Str. Tirnavei Nr. 20
RO-500327 Brasov
Phone +40 268 312-805
Fax +40 268 312-805
dudasludovic@xnet.ro

 **Croatia**
 ebm-papst Industries Kft.
 Ezred u. 2.
H-1044 Budapest
Phone +36 1 8722-190
Fax +36 1 8722-194
office@hu.ebmpapst.com

 **Czech Republic / Slovakia**
 ebm-papst CZ s.r.o.
 Kaštanová 34a
CZ-620 00 Brno
Phone +420 547 232-617
Fax +420 547 232-622
info@ebmpapst.cz
www.ebmpapst.cz

 **Denmark**
 ebm-papst Denmark ApS
 Vallensbækvej 21
DK-2605 Brøndby
Phone +45 43 631111
Fax +45 43 630505
mail@dk.ebmpapst.com
www.ebmpapst.dk

 **Estonia**
 ebm-papst Oy, Eesti Filiaal
 Kesk tee 13
Aaviku küla, Jüri Tehnopol
EST-75301 Rae Vald, Harjumaa
Phone +372 65569-78
Fax +372 65569-79
www.ebmpapst.ee

 **Finland**
 ebm-papst Oy
 Puistotie 1
FIN-02760 Espoo
Phone +358 9 887022-0
Fax +358 9 887022-13
mailbox@ebmpapst.fi
www.ebmpapst.fi

 **France**
 ebm-papst SARL
 ZI Nord - rue A. Mohler
BP 62
F-67212 Obernai-Cedex
Phone +33 820 326266
Fax +33 3 88673883
info@ebmpapst.fr
www.ebmpapst.fr

 **Greece**
 Helcoma
 Th. Rotas & Co OE
Davaki 65
GR-17672 Kallithea-Attiki
Phone +30 210 9513-705
Fax +30 210 9513-490
contact@helcoma.gr
www.helcoma.gr





 **Hungary**
 ebm-papst Industries Kft.
 Ezred u. 2.
H-1044 Budapest
Phone +36 1 8722-190
Fax +36 1 8722-194
office@hu.ebmpapst.com

 **Iceland**
 RJ Engineers
 Stangarhyl 1A
IS-110 Reykjavik
Phone +354 567 8030
Fax +354 567 8015
rj@rj.is
www.rj.is

 **Ireland**
 ebm-papst Limited
 Portlaoise Business & Technology Park
Mountrath Road
IRL-Portlaoise, Co. Laois
Phone +353 5786 643-43
Fax +353 5786 643-46
sales@ie.ebmpapst.com
www.ebmpapst.ie


 **Italy**
 ebm-papst Srl
 Via Cornaggia 108
I-22076 Mozzate (Co)
Phone +39 0331 836201
Fax +39 0331 821510
info@it.ebmpapst.com
www.ebmpapst.it

 **Macedonia**
 ebm-papst Industries Kft.
 Ezred u. 2.
H-1044 Budapest
Phone +36 1 8722-190
Fax +36 1 8722-194
office@hu.ebmpapst.com

-  fan agent
-  compact fan agent
-  motor specialist
-  motor agent

ebm-papst representatives & subsidiaries

 **Netherlands**
 ebm-papst Benelux B.V.
 Engelseweg 127
 NL-5705 AC Helmond
 Phone +31 492 502-900
 Fax +31 492 502-950
 verkoop@nl.ebmpapst.com
 www.ebmpapst.nl

 **Norway**
 ebm-papst AS
 P.B. 173 Holmlia
 N-1203 Oslo
 Phone +47 22 763340
 Fax +47 22 619173
 mailbox@ebmpapst.no
 www.ebmpapst.no

 **Poland**
 ebm-papst Polska Sp. z o.o.
 ul. Annopol 4A
 PL-03236 Warszawa
 Phone +48 22 6757819
 Fax +48 22 6769587
 office@ebmpapst.pl
 www.ebmpapst.pl

 **Portugal**
 ebm-papst (Portugal), Lda.
 Av. Marechal Gomes da Costa, 35 e
 Rua Conselheiro Emidio Navarro
 P-1800-255 Lisboa
 Phone +351 218 394-880
 Fax +351 218 394-759
 info@pt.ebmpapst.com
 www.ebmpapst.pt

 **Romania**
 ebm-papst Romania S.R.L.
 Str. Tirnavei Nr. 20
 RO-500327 Brasov
 Phone +40 268 312-805
 Fax +40 268 312-805
 dadasludovic@xnet.ro

 **Russia**
 ebm-papst Ural GmbH
 Posadskaja-Strasse, 23(E), 3
 RU-620102 Ekaterinburg
 Phone +7 343 2338000
 Fax +7 343 2337788
 Konstantin.Molokov@ru.ebmpapst.com
 www.ebmpapst.ur.ru

 ebm-papst Rus GmbH
 proezd 4529, vladenie 5, stroenie 1
 RU-141000 Mytistschi, Oblast Moskau
 Phone +7 495 9807524
 Fax +7 495 5140924
 info@ebmpapst.ru
 www.ebmpapst.ru



 **Serbia & Montenegro**
 ebm-papst Industries Kft.
 Ezred u. 2.
 H-1044 Budapest
 Phone +36 1 8722-190
 Fax +36 1 8722-194
 office@hu.ebmpapst.com

 **Spain**
 ebm-papst Ibérica S.L.
 Avda. del Sistema Solar, 29
 E-28830 San Fernando de Henares (Madrid)
 Phone +34 91 6780894
 Fax +34 91 6781530
 ventas@ebmpapst.es

 **Sweden**
 ebm-papst AB
 Äggelundavägen 2
 S-17562 Järfälla
 Phone +46 8 7619400
 Fax +46 8 362306
 info@ebmpapst.se
 www.ebmpapst.se

 **Switzerland**
 ebm-papst AG
 Rütisbergstrasse 1
 CH-8156 Oberhasli
 Phone +41 44 73220-70
 Fax +41 44 73220-77
 verkauf@ebmpapst.ch
 www.ebmpapst.ch

 **Turkey**
 Akantel Elektronik San. Tic. LTD. Sti.
 Atatürk Organize Sanayi
 Bögesi 10007 SK. No.:6
 TR-35620 Cigli-Izmir
 Phone +90 232 3282090
 Fax +90 232 3280270
 akantel@akantel.com.tr
 www.ebmpapst.com.tr

 **Ukraine**
 ebm-papst Ukraine LLC
 Lepse Boulevard, 4, Building 47
 UA-03067 Kiev
 Phone +38 044 2063091
 Fax +38 044 2063091
 mail@ebmpapst.ua
 www.ebmpapst.ua

 **United Kingdom**
 ebm-papst UK Ltd.
 Chelmsford Business Park
 GB-Chelmsford Essex CM2 5EZ
 Phone +44 1245 468555
 Fax +44 1245 466336
 sales@uk.ebmpapst.com
 www.ebmpapst.co.uk

 ebm-papst Automotive & Drives (UK) Ltd.
 The Smithy
 Fidlers Lane, East Ilsley
 GB-Berkshire RG20 7LG
 Phone +44 1635 2811-11
 Fax +44 1635 2811-61
 A&Dsales@uk.ebmpapst.com
 www.ebmpapst-ad.com

America



Argentina



ebm-papst de Argentina S.A.
Hernandarias 148 Lomas del Mirador
Pcia. de Buenos Aires (1752)
Phone +54 11 46576135
Fax +54 11 46572092
ventas@ar.ebmpapst.com
www.ebmpapst.com.ar



Brasil



ebm-papst Motores Ventiladores Ltda.
Av. José Giorgi, 301 Galpões B6+B7
Condominio Logical Center
BR-06707-100 Cotia - São Paulo
Phone +55 11 4613-8700
Fax +55 11 3164-8924
vendas@br.ebmpapst.com
www.ebmpapst.com.br



Canada



ebm-papst Canada Inc.
1800 Ironstone Manor, Unit 2
CDN-Pickering, Ontario, L1W3J9
Phone +1 905 420-3533
Fax +1 905 420-3772
sales@ca.ebmpapst.com
www.ebmpapst.ca



Mexico



ebm Industrial S.de R.L. de C.V.
Paseo de Tamarindos 400-A-5º Piso
Col. Bosques de las Lomas
MEX-Mexico 05120, D.F.
Phone +52 55 3300-5144
Fax +52 55 3300-5243
sales@mx.ebmpapst.com
www.ebmpapst.com.mx

USA



ebm-papst Inc.
P.O. Box 4009
100 Hyde Road
USA-Farmington, CT 06034
Phone +1 860 674-1515
Fax +1 860 674-8536
sales@us.ebmpapst.com
www.ebmpapst.us



ebm-papst Automotive & Drives, Inc.
3200 Greenfield, Suite 255
USA-Dearborn, MI 48120
Phone +1 313 406-8080
Fax +1 313 406-8081
automotive@us.ebmpapst.com
www.ebmpapst-automotive.us

Africa



South Africa



ebm-papst South Africa (Pty) Ltd.
P.O. Box 3124
1119 Yacht Avenue
ZA-2040 Honeydew
Phone +27 11 794-3434
Fax +27 11 794-5020
info@za.ebmpapst.com
www.ebmpapst.co.za



fan agent



compact fan agent



motor specialist



motor agent

ebm-papst representatives & subsidiaries

Asia



China



ebm-papst Ventilator (Shanghai) Co., Ltd.
No. 418, Huajing Road
WaiGaoQiao Free Trade Zone
No. 2001, Yang Gao (N) Road
VRC-200131 Shanghai, P.R. of China
Phone +86 21 5046-0183
Fax +86 21 5046-1119
sales@cn.ebmpapst.com
www.ebmpapst.com.cn



Hong Kong



ebm-papst Hong Kong Ltd.
Unit No. 13,9 / F
Technology Park, 18 On Lai Street
Siu Lek Yuen, Shatin N.T.
Hong Kong - P.R. of China
Phone +852 2145-8678
Fax +852 2145-7678
info@hk.ebmpapst.com



India



ebm-papst India Pvt. Ltd.
26/3, G.N.T. Road, Erukkencherry
IND-Chennai-600118
Phone +91 44 25372556
Fax +91 44 25371149
sales@in.ebmpapst.com
www.ebmpapst.in



Indonesia



ebm-papst Indonesia
Representative Office
German Centre, 4th Floor, Suite 4470
Jl. Kapt. Subijono Dj. Bumi Serpong Damai
RI-15321 Tangerang
Phone +62 21 5376250
Fax +62 21 5388305
salesdept@id.ebmpapst.com



Israel



Polak Bros. Import Agencies Ltd.
9 Hamefalsim Street
IL-Kiryat Arie, Petach-Tikva 49514
Phone +972 3 9100300
Fax +972 3 5796679
polak@polak.co.il
www.polak.co.il



Japan



ebm-papst Industries Japan K.K.
12 Floor, Benex S-3 Bldg.
3-20-8 Shinyokohama, Kohoku-ku
J-222-0033 Yokohama
Phone +81 45 47057-51
Fax +81 45 47057-52
info@jp.ebmpapst.com
www.ebmpapst.jp



Korea



ebm-papst Korea Co. Ltd.
6F, Trutech Bldg.
B 6-2, Digital Media City (DMC)
Sangam-Dong, Mapo-Gu
ROK-Seoul 121-270
Phone +82 2 366213-24
Fax +82 2 366213-26
info@kr.ebmpapst.com
www.ebmpapst.co.kr



Malaysia



ebm-papst Malaysia
Representative Office
Unit 12-2, Jalan USJ Sentral 3
Persiaran Subang, Selangor Darul Ehsan
MAL-47600 Subang Jaya
Phone +60 3 8024-1680
Fax +60 3 8024-8718
salesdept@my.ebmpapst.com



Singapore



ebm-papst SEA Pte. Ltd.
No. 23 Ubi Road 4
#06-00 Olympia Industrial Building
SGP-Singapore 408620
Phone +65 65513789
Fax +65 68428439
salesdept@sg.ebmpapst.com



Taiwan



ETECO Engineering & Trading Corp.
10F-I, No. 92, Teh-Wei Str.
RC-Tsow-Inn District, Kaohsiung
Phone +886 7 557-4268
Fax +886 7 557-2788
eteco@ms22.hinet.net
www.ebmpapst.com.tw



Thailand



ebm-papst Thailand Co., Ltd.
99/349 Na-Nakorn Bldg., 4th Floor
Chaeng Wattana Road, Thungsonghong,
THA-10210 Laksi, BKK
Phone +66 2 57615-24
Fax +66 2 57615-42
salesdept@th.ebmpapst.com



United Arab Emirates



ebm-papst Middle East FZE
PO Box 17755
Jebel Ali Free Zone / FZS1 / AP05
UAE-Dubai
Phone +971 4 88608-26
Fax +971 4 88608-27
info@ae.ebmpapst.com
www.ebmpapst.ae



Vietnam



ebm-papst Vietnam
Representative Office
Room #102, 25 Nguyen Van Thu Street
District 1
VN-Ho Chi Minh City
Phone +84 8 39104099
Fax +84 8 39103970
linh.nguyen@vn.ebmpapst.com

Australia



Australia

ebm-papst A&NZ Pty Ltd.



10 Oxford Road



AUS-Laverton North, Victoria, 3026

Phone +61 3 9360-6400

Fax +61 3 9360-6464

sales@ebmpapst.com.au

www.ebmpapst.com.au



New Zealand

ebm-papst A&NZ Pty Ltd.



102 Henderson Valley Road



NZ-Henderson, Auckland 1230

Phone +64 9 837-1884

Fax +64 9 837-1899

sales@ebmpapst.com.au

www.ebmpapst.com.au

ebm-papst
Mulfingen GmbH & Co. KG

Bachmühle 2
D-74673 Mulfingen
Phone +49 7938 81-0
Fax +49 7938 81-110
info1@de.ebmpapst.com

www.ebmpapst.com

ebm-papst
St. Georgen GmbH & Co. KG

Hermann-Papst-Straße 1
D-78112 St. Georgen
Phone +49 7724 81-0
Fax +49 7724 81-1309
info2@de.ebmpapst.com