EC/AC centrifugal fans - RadiCal

version 04/2011

GREEN TECH

The engineer's choice

ebmpapst

The new RadiCal centrifugal fans

Impellers made of one piece of plastic with an optimised flow channel, combined with a proven single-phase asynchronous motor or compact GreenTech EC motor: these are the outstanding features of the new generation of backward-curved centrifugal fans for operation without scroll housing. That's RadiCal!

The impellers of size 133 to 250 are manufactured in one piece - because there are no joints, they attain a high rotational speed, which in turn provides high power density of the fan. The styling of the impeller has been optimised using complex simulation models that are adjusted using measurements of prototypes. The result is an optimal, low-loss flow of air through the impeller without drastic cross-sectional changes, which are a well-known source of losses in the impeller. A uniform flow profile without laminar separation also means fewer noise sources and thus better acoustics. That's RadiCal too!

The motor in GreenTech EC technology is likewise new. The integrated control electronics of the motor are now designed such that the EC GreenTech fan has the same mounting dimensions as the combination of the same impeller with an asynchronous motor. In addition, the specified EC centrifugal fan attains significantly higher air performance than the AC variant with identical dimensions. The GreenTech EC fans are available in two different control configurations: one with two fixed speed stages and another with the familiar continuous control option via a combined 0-10V/PWM control input.

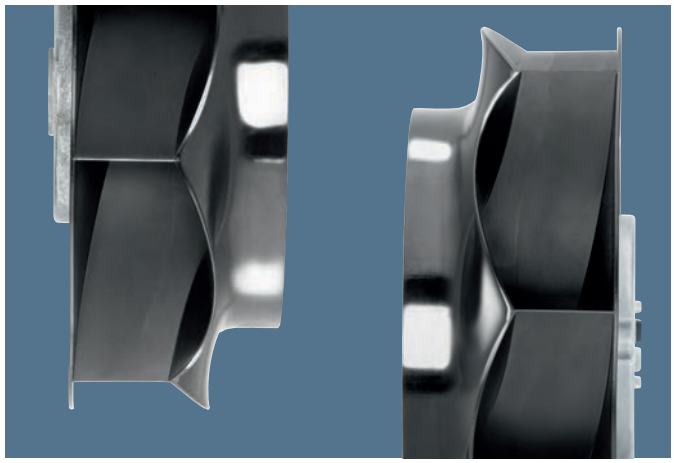
This opens up entirely new possibilities for applications in ventilation and air-conditioning technology as well as other areas. For example, ebmpapst AC fans can be replaced with the latest fans in GreenTech EC technology without expensive modifications.

The advantages at a glance:

– High efficiency with improved impeller technology and new EC motors
– Extremely quiet running with optimised flow of air through the impeller
– Significantly reduced rotation noise
– Unmatched compactness
– Mechanical compatibility of AC and EC fans
– EC fans with 2 speeds or continuous control
– High power density
– Robust design and maintenance-free operation
– Includes ErP* compliance (see individual designation)

*ErP: Energy related Product – defined minimum requirements for fans in accordance with the EcoDesign directive for fans with a drive output of 125 W and above.

Table of contents



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 co-operation 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 eco-friendly production.
GreenTech also stands for maximum energy efficiency in our production processes. There, the intelligent use of industrial waste heat and groundwater 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.

EC centrifugal fans RadiCal

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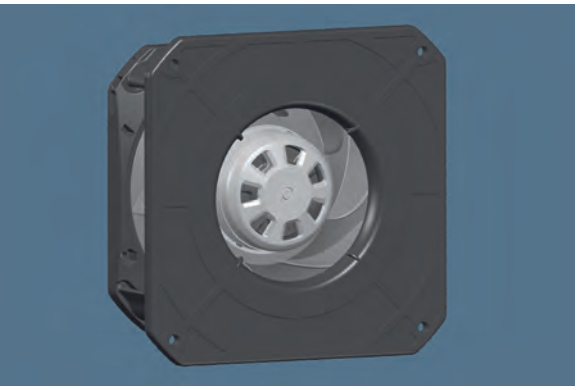
EC centrifugal fans RadiCal

backward curved, Ø 133



- **Material:** Housing: Plastic PA 6, fibreglass-reinforced
  Impeller: Plastic PA 6, fibreglass-reinforced
  Rotor: Thick layer passivated
  Electronics housing: Die-cast alumimium
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 54
- **Insulation class:** "B"
- **Mounting position:** Any
- **Condensate discharges:** None, open rotor
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

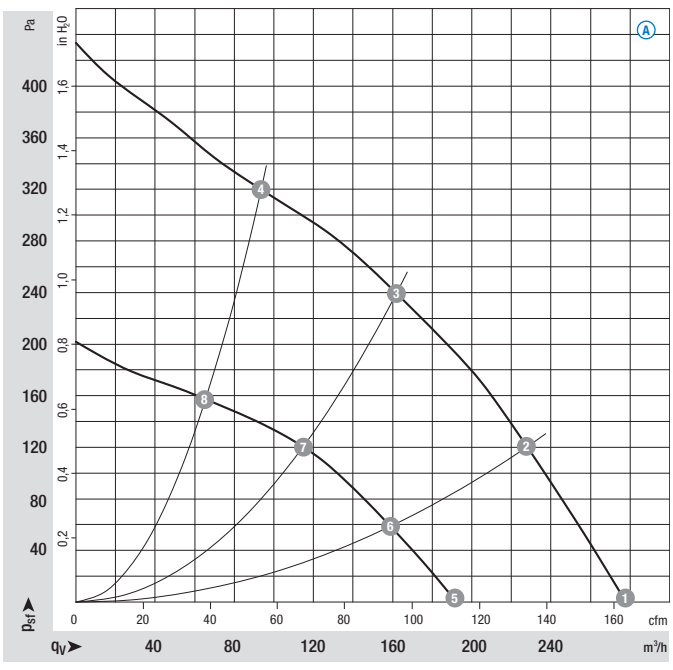
Nominal data

Type	Motor	Curve	Nominal voltage range	Frequency	Speed/rpm(1)	Max. input power(1)	Max. current draw(1)	Perm. amb. temp.	Electr. connection
			VAC	Hz	rpm	W	A	°C	p. 64/65
*3G 133	M3G 045-AI	A	1~ 200-240	50/60	3730	27	0,26	-25..+60	H3)
*3G 133	M3G 045-AI	B	1~ 200-240	50/60	3730	27	0,26	-25..+60	H4)

subject to alterations

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

Curves (2 Speed stages)



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 measurment 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 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
A	1	3930	24	0,23	66
A	2	3800	26	0,26	63
A	3	3730	27	0,26	61
A	4	3835	26	0,25	65
A	5	2755	10	0,11	58
A	6	2690	10	0,12	56
A	7	2655	11	0,13	53
A	8	2705	10	0,12	57

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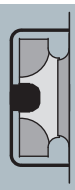
– **Technical features** Ⓐ **:** • Speed adjustment input (230V) • Electronics / motor overtemperature protection • Locked-rotor protection

– **Technical features** Ⓑ **:** • Control input 0-10 VDC / PWM • Output 10 VDC max. 1,1 mA • Tach output • Locked-rotor protection
• Electronics / motor overtemperature protection

– **EMC:** Interference emission acc. to EN 61000-6-3
Interference immunity acc. to EN 61000-6-2
Harmonics acc. to EN 61000-3-2/3
– **Leakage current:** < 3,5 mA acc. to EN 60950-1
– **Cable exit:** Variable
– **Protection class:** I
– **Product conforming to standard:** EN 60335-1, CE
– **Approvals:** VDE, UL, CSA, CCC, GOST are applied for

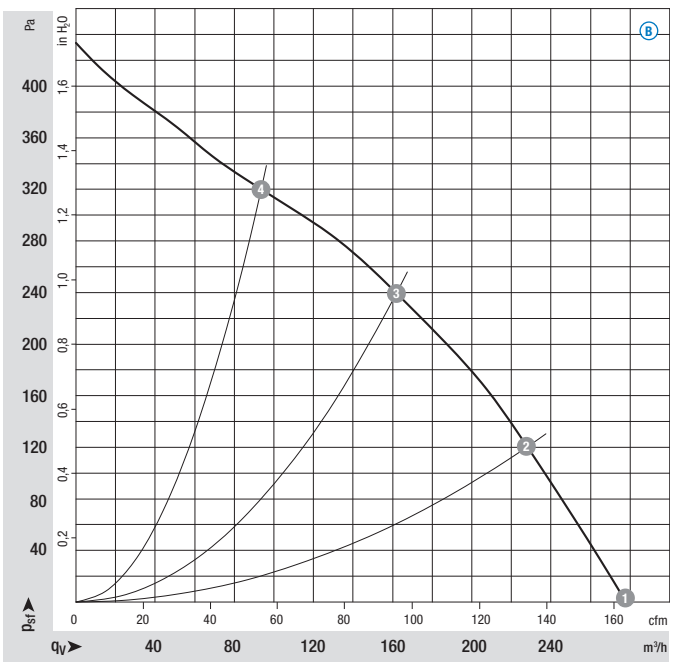
Mass of centrifugal fan



Mass of centrifugal module with support basket

Centrifugal fan	kg	Centrifugal module	kg
R3G 133-RA01 -01	0,5	**K3G 133-RA01 -01**	0,75
R3G 133-RA01 -03	0,5	**K3G 133-RA01 -03**	0,75

Curves (Speed-controlled)



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 measurment 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 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
Ⓑ	1	3930	24	0,23	66
Ⓑ	2	3800	26	0,26	63
Ⓑ	3	3730	27	0,26	61
Ⓑ	4	3835	26	0,25	65

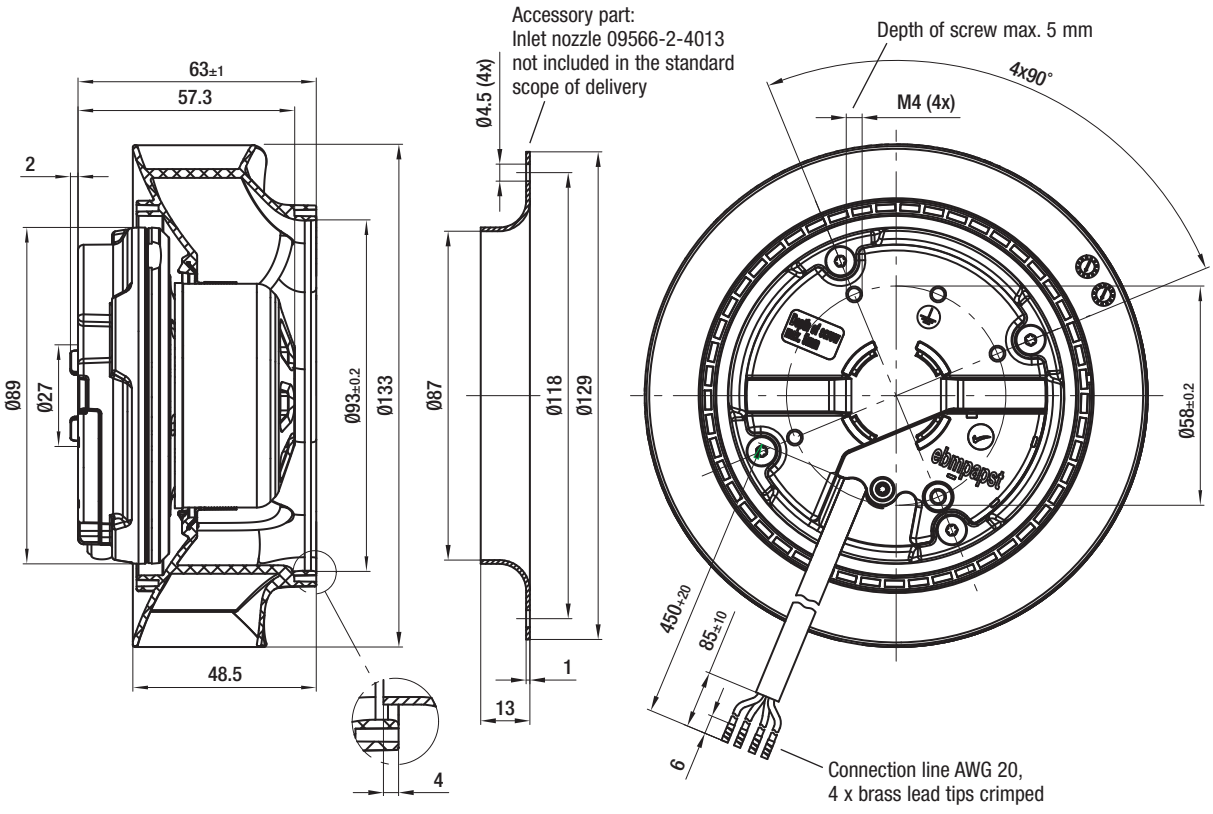
Drawings p. 10 ff.

Electr.connection p. 64/65

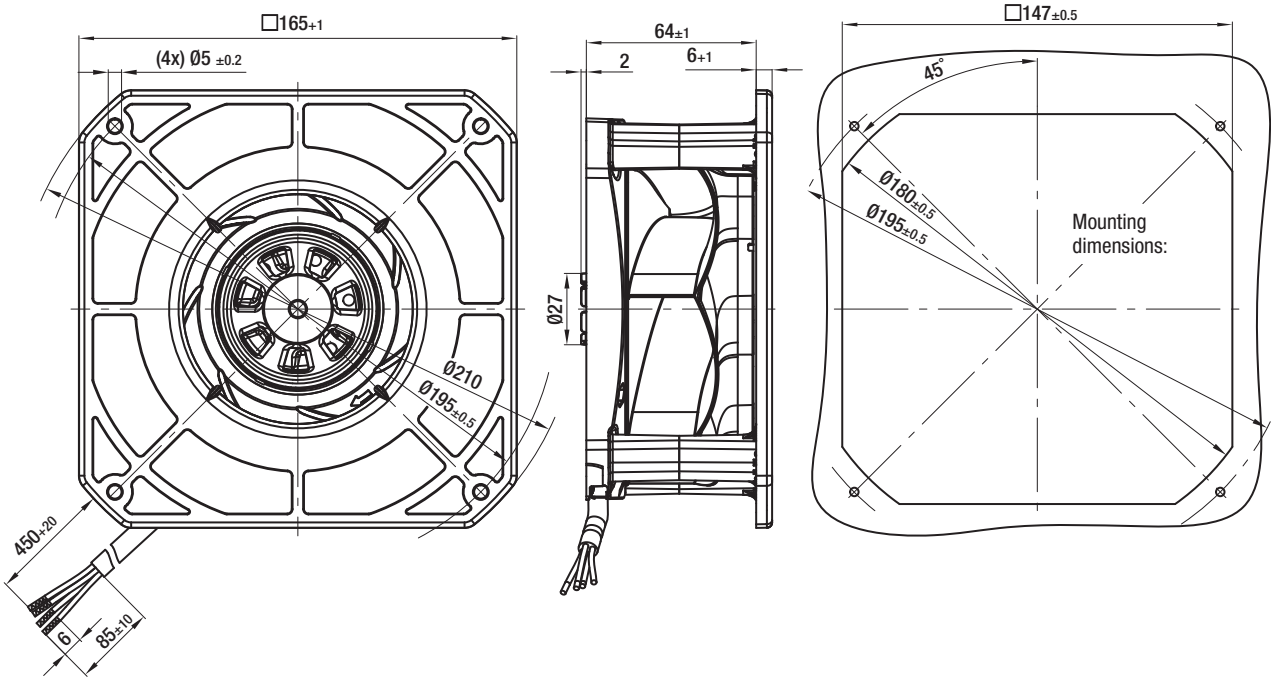
EC centrifugal fans RadiCal

backward curved, Ø 133, 2 Speed stages

R3G 133-RA01-01



K3G 133-RA01-01



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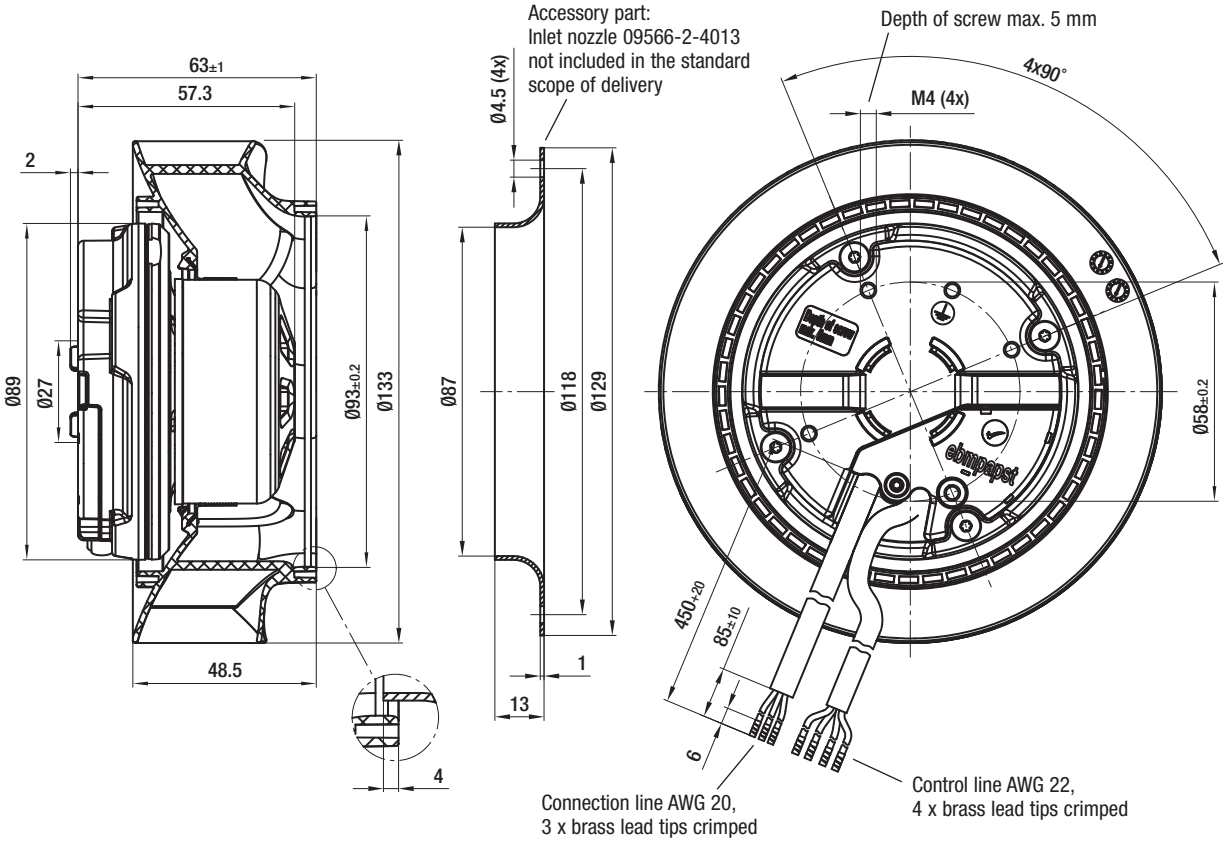
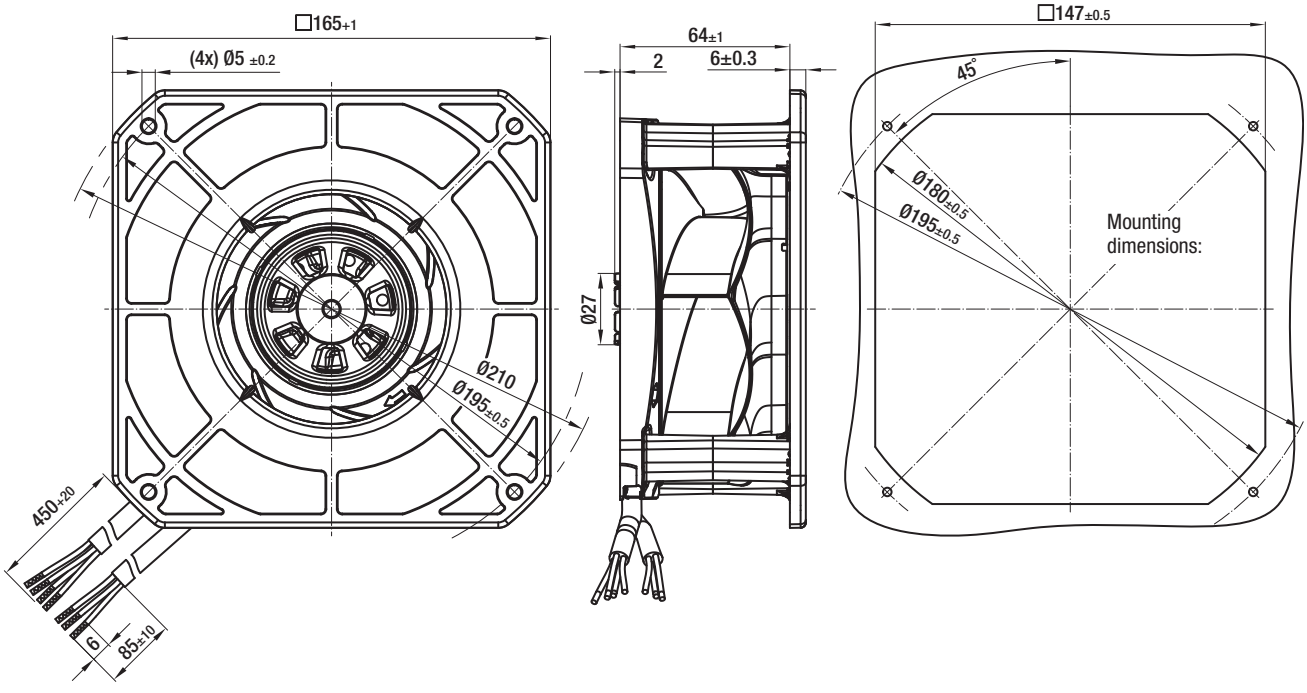
EC centrifugal fans RadiCal

backward curved, Ø 133, Speed-controlled

R3G 133-RA01-03



K3G 133-RA01-03



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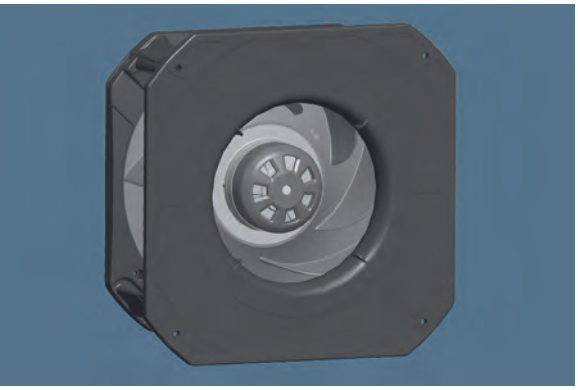
EC centrifugal fans RadiCal

backward curved, Ø 190



- **Material:** Housing: Plastic PA 6, fibreglass-reinforced
  Impeller: Plastic PA 6, fibreglass-reinforced
  Rotor: Thick layer passivated
  Electronics housing: Die-cast alumimium
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 54
- **Insulation class:** "B"
- **Mounting position:** Any
- **Condensate discharges:** None, open rotor
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

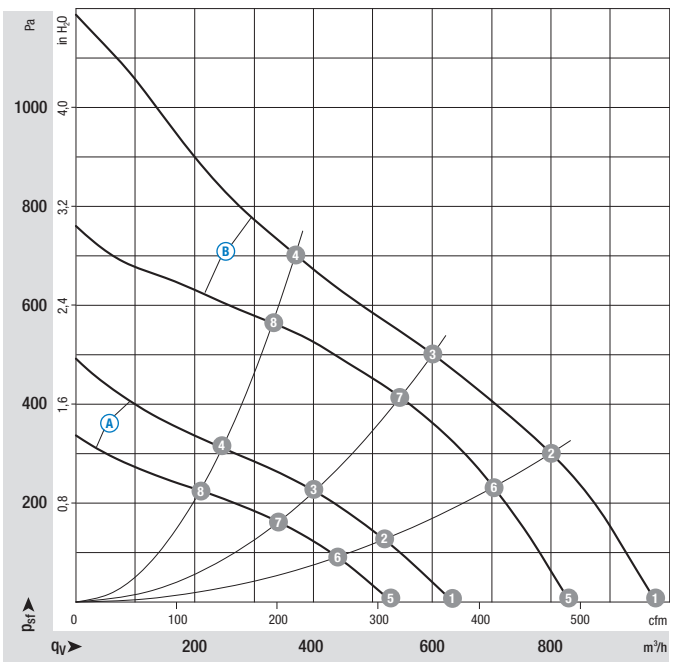
Nominal data

Type	Motor	Curve	Nominal voltage range	Frequency	Speed/rpm(1)	Max. input power(1)	Max. current draw(1)	Perm. amb. temp.	Electr. connection
			VAC	Hz	rpm	W	A	°C	p. 64/65
*3G 190	M3G 055-BD	A	1~ 200-240	50/60	2710	57	0,43	-25..+60	H3)
*3G 190	M3G 055-CF	B	1~ 200-240	50/60	4060	170	1,40	-25..+60	H3)
*3G 190	M3G 055-BI	C	1~ 200-240	50/60	3200	85	0,75	-25..+60	H4)
*3G 190	M3G 055-CF	D	1~ 200-240	50/60	4060	170	1,40	-25..+60	H4)

subject to alterations

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

Curves (2 Speed stages)



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 measurment 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 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
A	1	2880	49	0,36	69
A	2	2815	52	0,40	64
A	3	2710	57	0,43	62
A	4	2775	54	0,41	66
A	5	2435	30	0,23	65
A	6	2390	32	0,25	60
A	7	2325	35	0,27	59
A	8	2355	33	0,26	63
B	1	4440	161	1,39	79
B	2	4235	165	1,40	73
B	3	4060	170	1,40	71
B	4	4155	160	1,37	73
B	5	3810	104	0,95	75
B	6	3765	117	1,10	71
B	7	3700	126	1,11	69
B	8	3745	117	1,07	71

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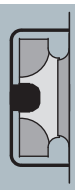
– **Technical features** Ⓐ Ⓑ **:** • Speed adjustment input (230V) • Electronics / motor overtemperature protection • Motor current limitation • Locked rotor protection • Soft start
– **Technical features** Ⓒ Ⓓ **:** • Control input 0-10 VDC / PWM • Output 10 VDC max. 1,1 mA • Tach output • Electronics / motor overtemperature protection • Motor current limitation • Locked rotor protection • Soft start
– **EMC:** Interference emission acc. to EN 61000-6-3
Interference immunity acc. to EN 61000-6-2
Harmonics acc. to EN 61000-3-2/3
– **Leakage current:** < 3,5 mA acc. to EN 60950-1
– **Cable exit:** Variable
– **Protection class:** I
– **Product conforming to standard:** EN 60335-1
– **Approvals:** VDE, UL, CSA, CCC, GOST are applied for

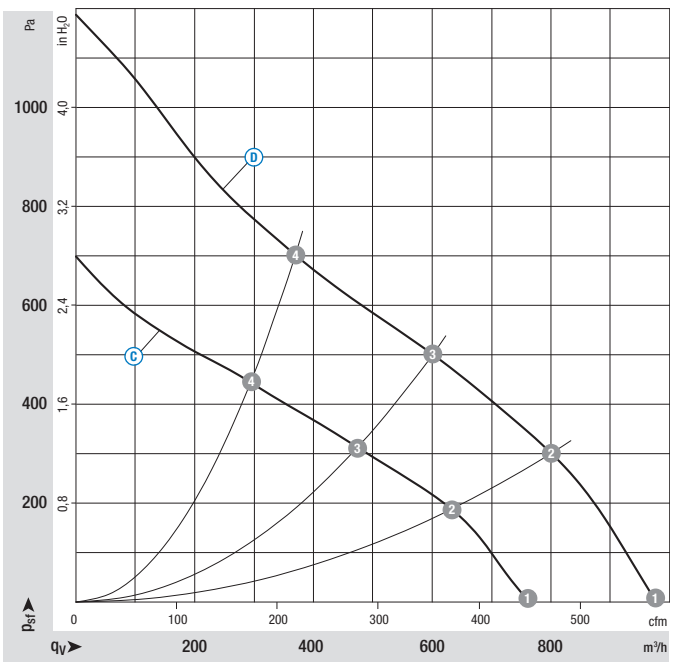
Mass of centrifugal fan



Mass of centrifugal module with support basket

Centrifugal fan	kg	Centrifugal module	kg
R3G 190-RB01 -01	0,85	**K3G 190-RB01 -01**	1,40
R3G 190-RD45 -01	1,36	**K3G 190-RD45 -01**	1,91
R3G 190-RC05 -03	1,06	**K3G 190-RC05 -03**	1,61
R3G 190-RD45 -03	1,36	**K3G 190-RD45 -03**	1,91

Curves (Speed-controlled)



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 measurment 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 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
Ⓒ	1	3435	80	0,69	73
Ⓒ	2	3335	85	0,73	68
Ⓒ	3	3200	85	0,75	66
Ⓒ	4	3300	85	0,74	70
Ⓓ	1	4440	161	1,39	79
Ⓓ	2	4235	165	1,40	73
Ⓓ	3	4060	170	1,40	71
Ⓓ	4	4155	160	1,37	73

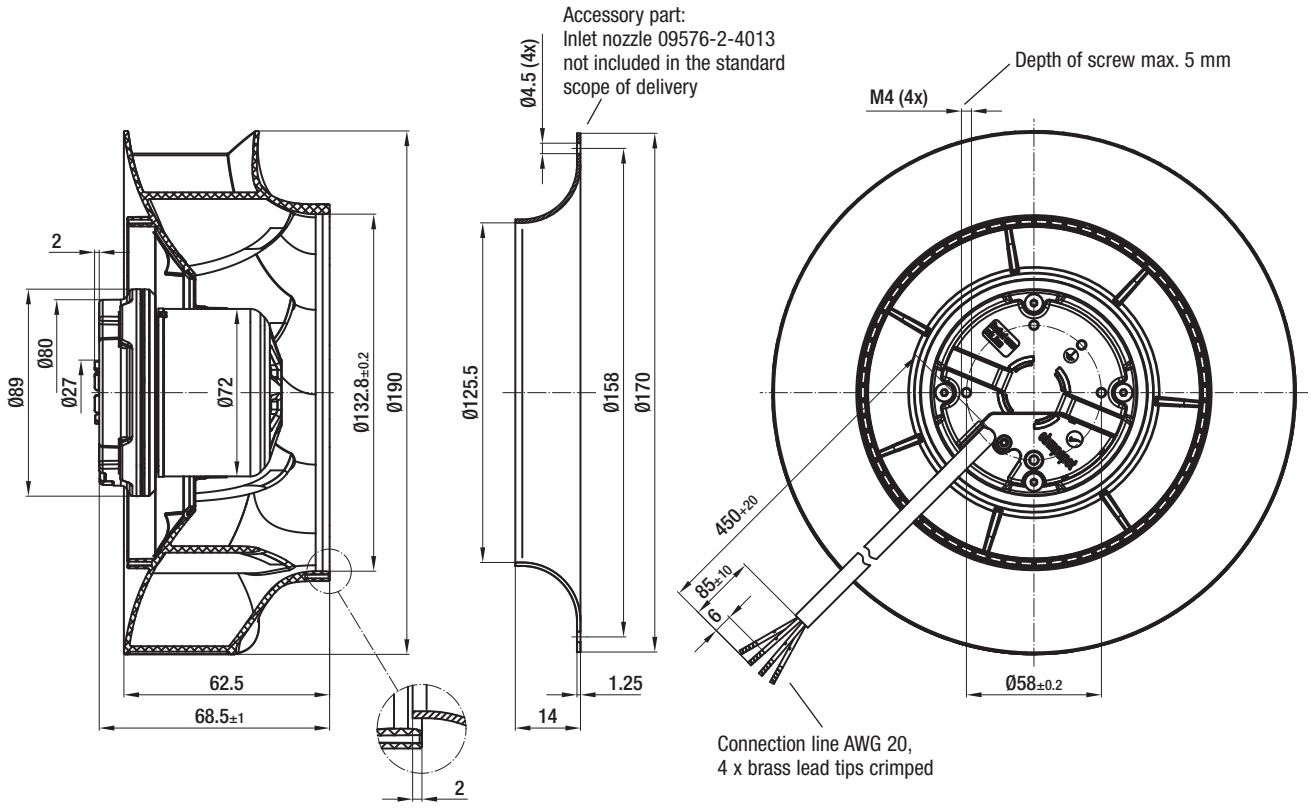
Drawings p. 14 ff.

Electr.connection p. 64/65

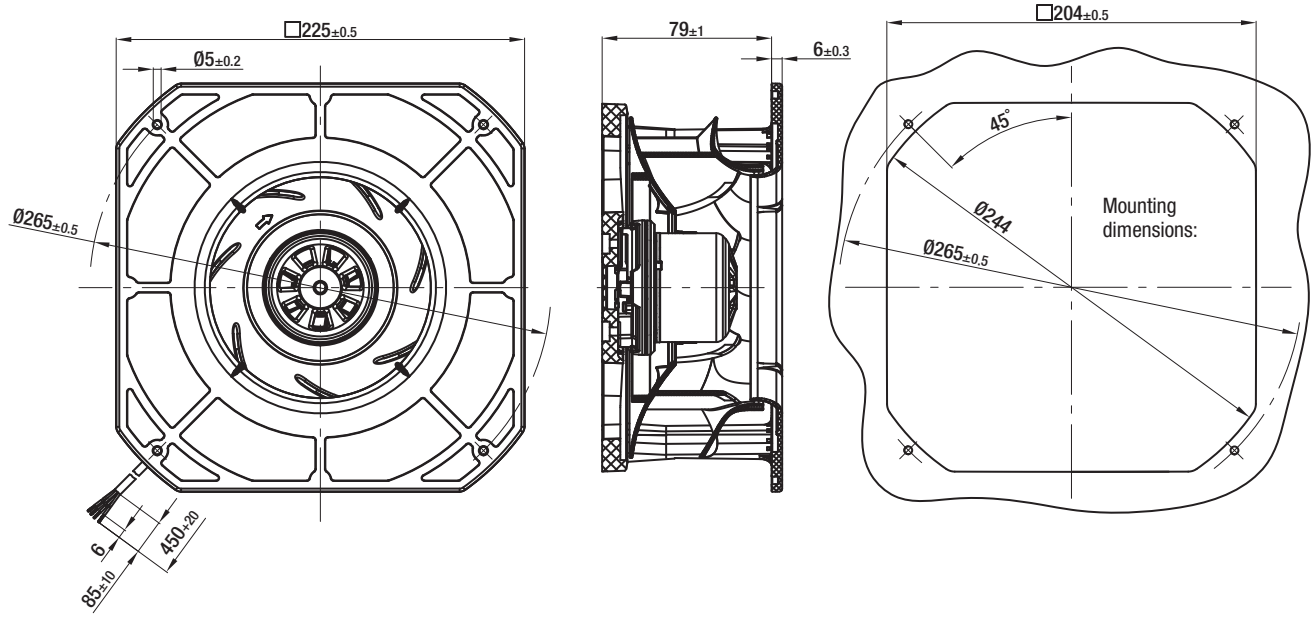
EC centrifugal fans RadiCal

backward curved, Ø 190, 2 Speed stages, 85 W

R3G 190-RB01-01



K3G 190-RB01-01



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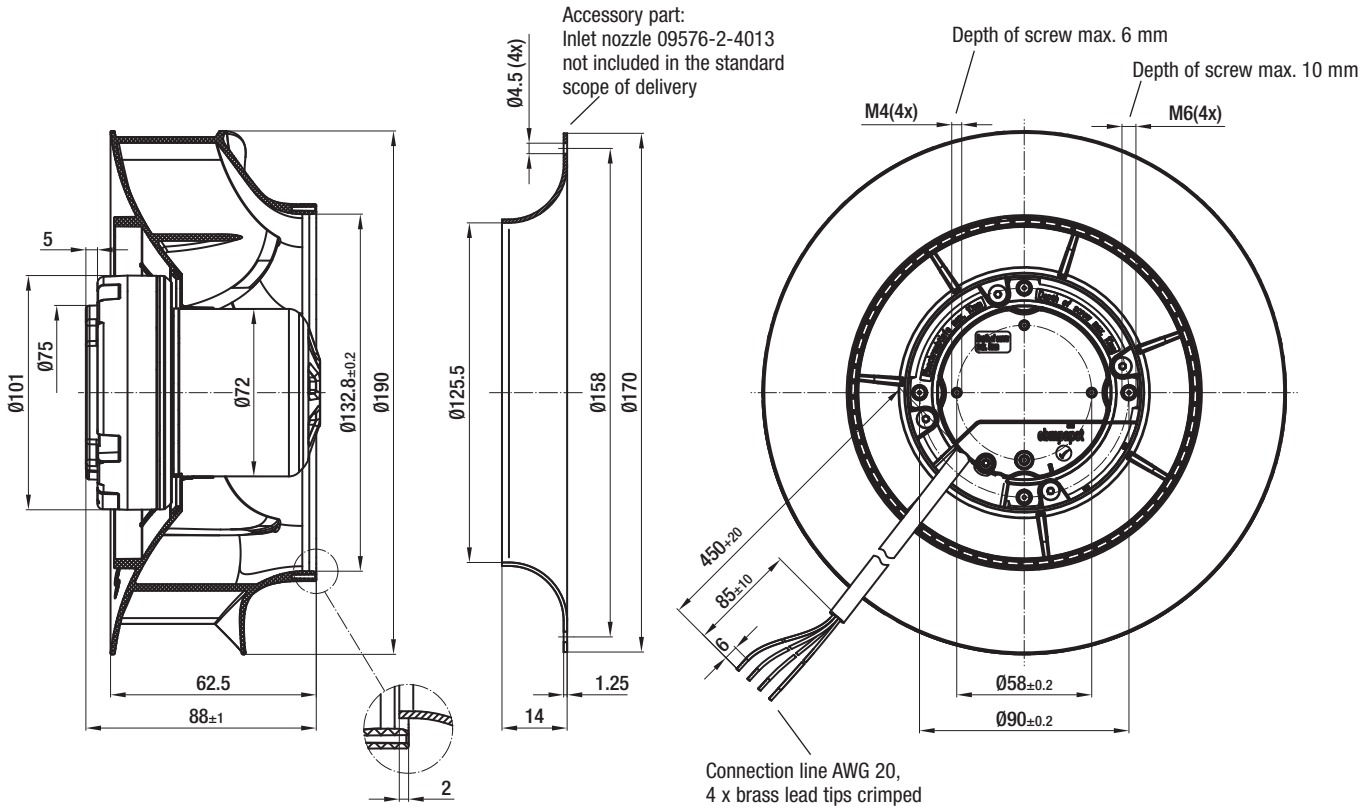
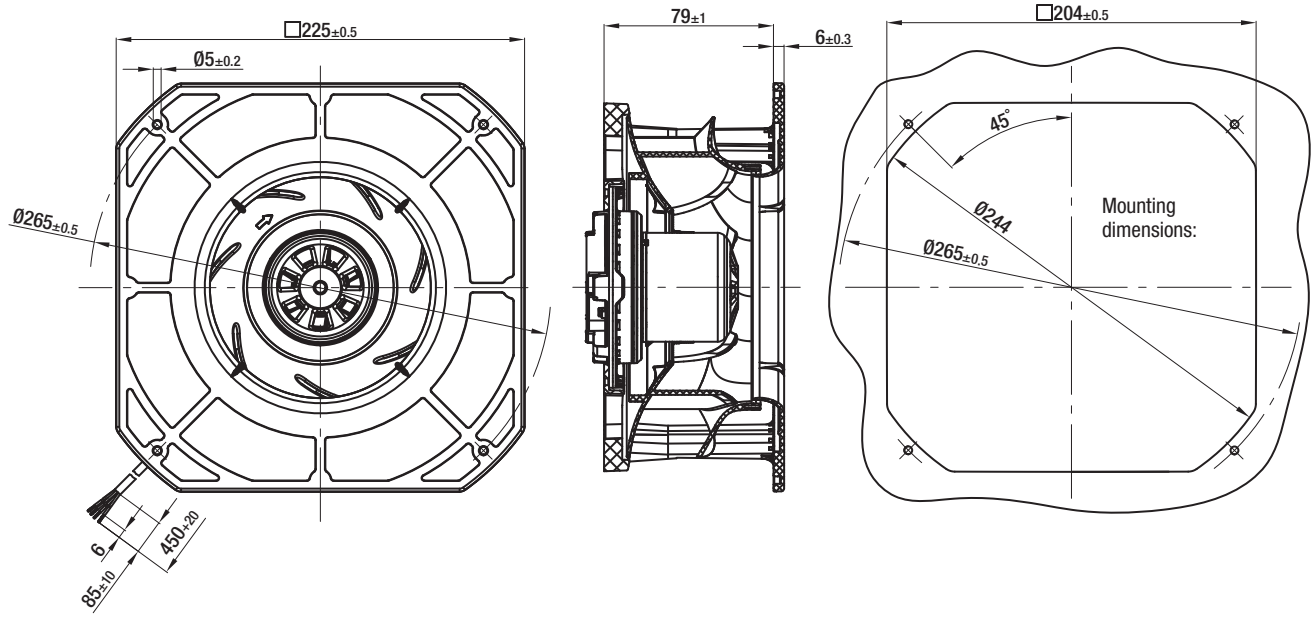
EC centrifugal fans RadiCal

backward curved, Ø 190, 2 Speed stages, 170 W

R3G 190-RD45-01



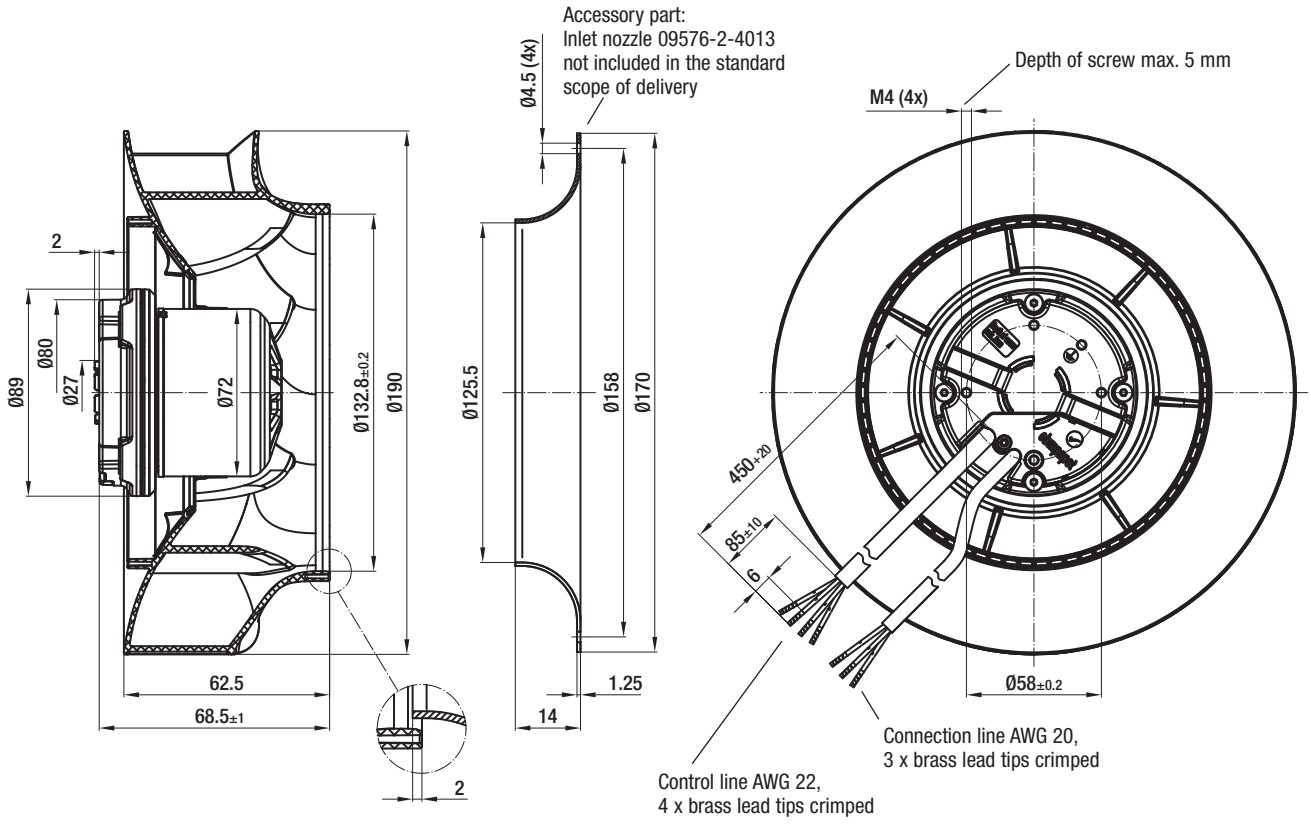
K3G 190-RD45-01



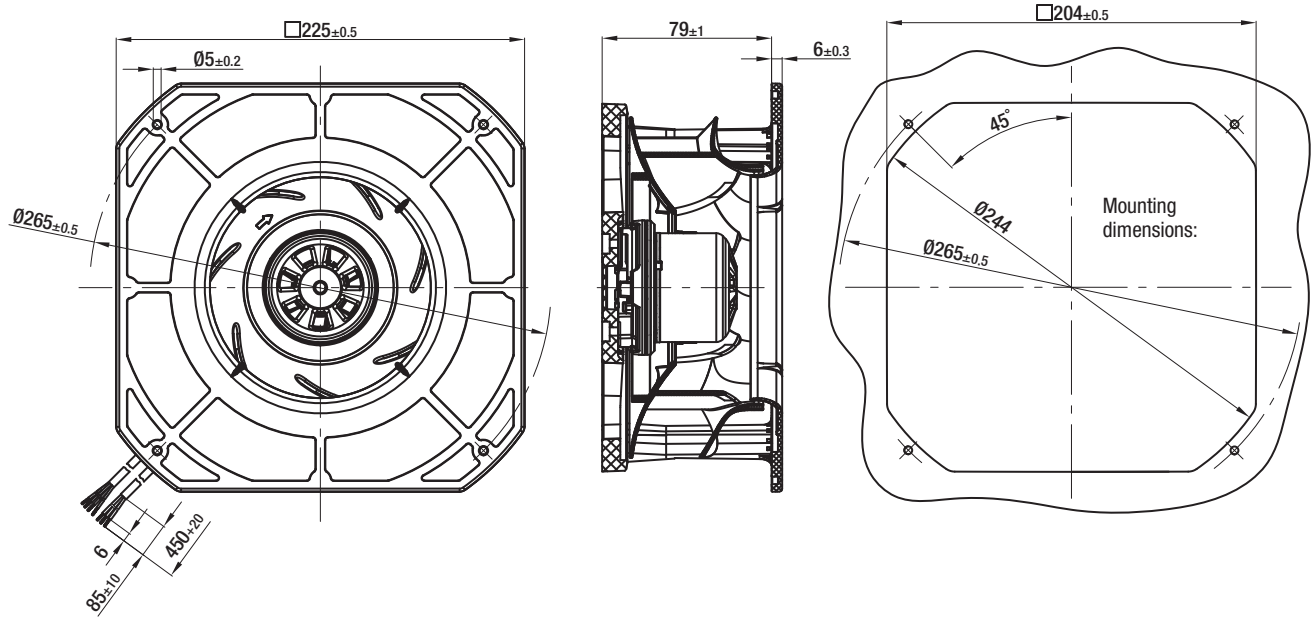
EC centrifugal fans RadiCal

backward curved, Ø 190, Speed-controlled, 85 W

R3G 190-RC05-03



K3G 190-RC05-03



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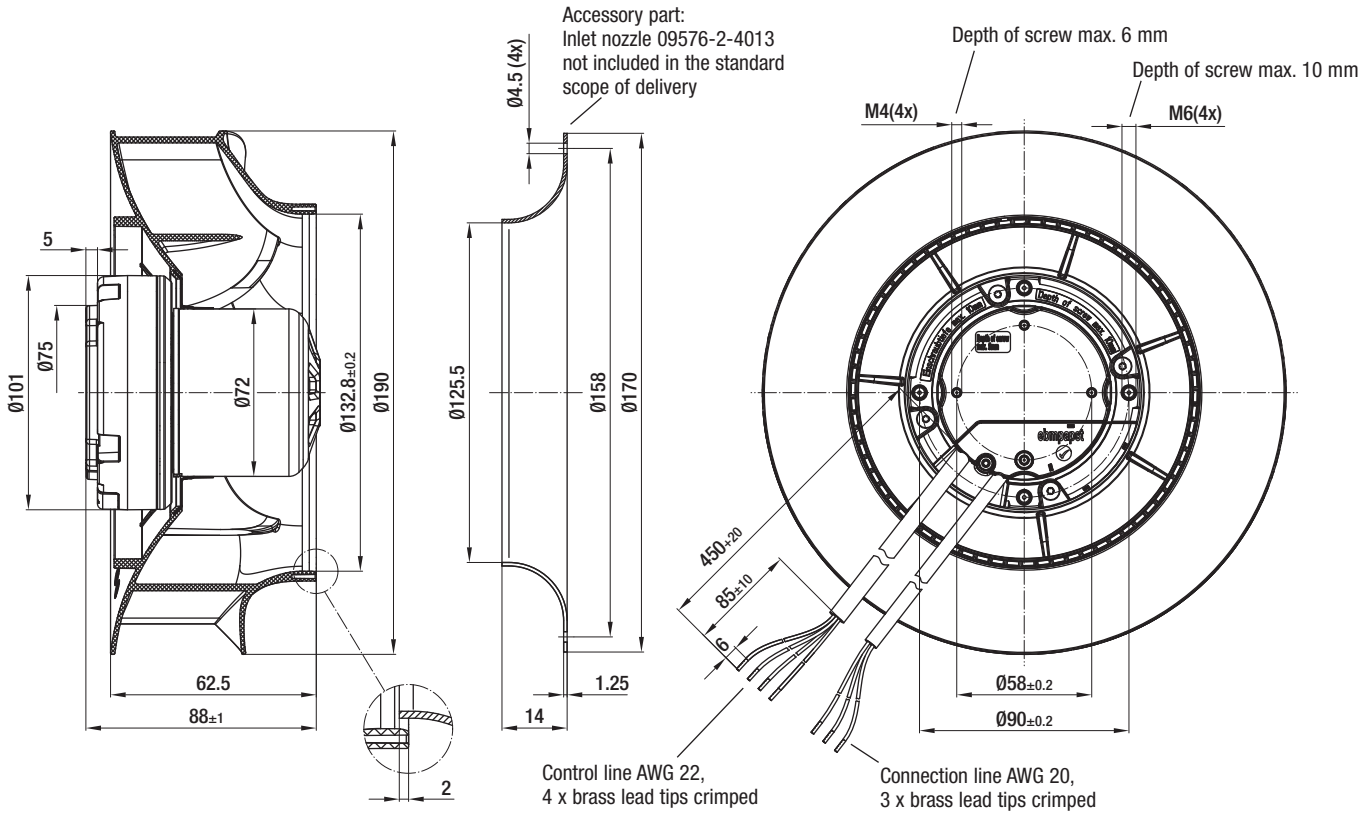
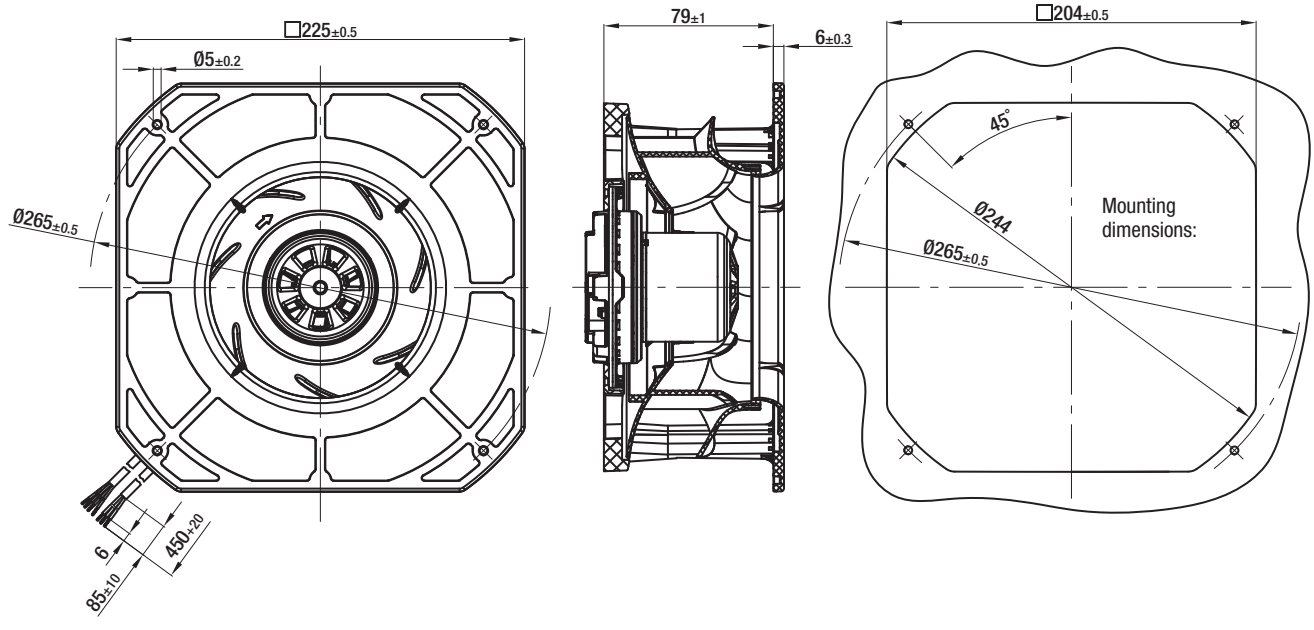
EC centrifugal fans RadiCal

backward curved, Ø 190, Speed-controlled, 170 W

R3G 190-RD45-03



K3G 190-RD45-03



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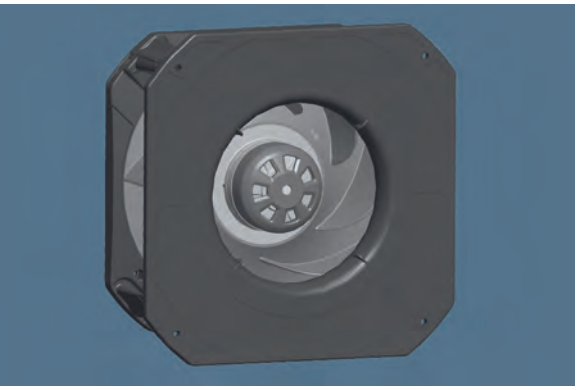
EC centrifugal fans RadiCal

backward curved, Ø 220



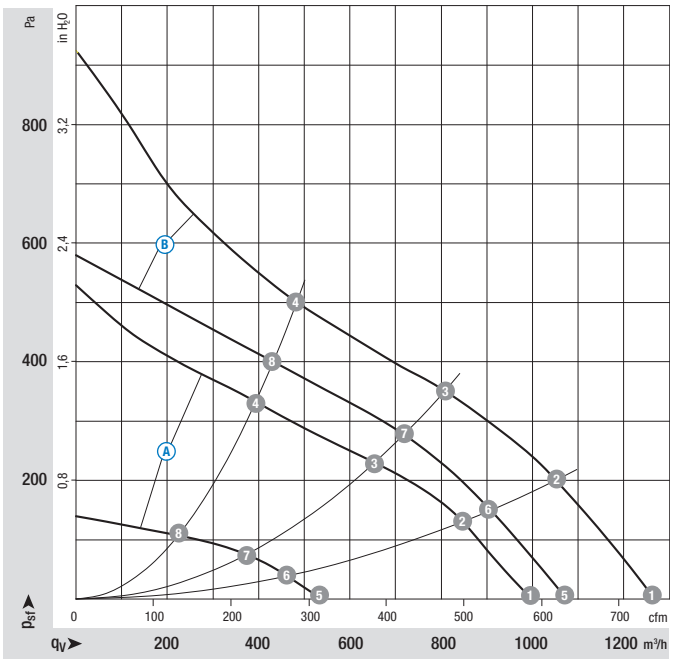
- **Material:** Housing: Plastic PA 6, fibreglass-reinforced
  Impeller: Plastic PA 6, fibreglass-reinforced
  Rotor: Thick layer passivated
  Electronics housing: Die-cast alumimium
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 54
- **Insulation class:** "B"
- **Mounting position:** Any
- **Condensate discharges:** None, open rotor
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data		Curve	Nominal voltage range	Frequency	Speed/rpm(1)	Max. input power(1)	Max. current draw(1)	Perm. amb. temp.	Electr. connection
Type	**Motor**		**VAC**	**Hz**	**rpm**	**W**	**A**	**°C**	p. 64/65
***3G 220**	M3G 055-BI	Ⓐ	1~ 200-240	50/60	2580	85	0,70	-25..+60	H3)
***3G 220**	M3G 055-CF	Ⓑ	1~ 200-240	50/60	3210	170	1,35	-25..+45	H3)
***3G 220**	M3G 055-BI	Ⓒ	1~ 200-240	50/60	2580	85	0,70	-25..+60	H4)
***3G 220**	M3G 055-CF	Ⓓ	1~ 200-240	50/60	3210	170	1,35	-25..+45	H4)

subject to alterations

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

Curves (2 Speed stages)



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 measurment 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 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
Ⓐ	1	2765	79	0,67	71
Ⓐ	2	2700	84	0,69	67
Ⓐ	3	2580	85	0,70	65
Ⓐ	4	2635	85	0,70	67
Ⓐ	5	1505	15	0,18	57
Ⓐ	6	1485	16	0,20	54
Ⓐ	7	1465	17	0,21	51
Ⓐ	8	1485	17	0,19	52
Ⓑ	1	3490	161	1,29	76
Ⓑ	2	3350	166	1,35	72
Ⓑ	3	3210	170	1,35	69
Ⓑ	4	3240	165	1,35	71
Ⓑ	5	2970	100	0,85	72
Ⓑ	6	2910	110	0,94	69
Ⓑ	7	2865	120	1,10	67
Ⓑ	8	2910	118	1,01	69

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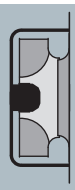
– **Technical features** Ⓐ Ⓑ **:** • Speed adjustment input (230V) • Electronics / motor overtemperature protection • Motor current limitation • Locked rotor protection • Soft start
– **Technical features** Ⓒ Ⓓ **:** • Control input 0-10 VDC / PWM • Output 10 VDC max. 1,1 mA • Tach output • Electronics / motor overtemperature protection • Motor current limitation • Locked rotor protection • Soft start
– **EMC:** Interference emission acc. to EN 61000-6-3
Interference immunity acc. to EN 61000-6-2
Harmonics acc. to EN 61000-3-2/3
– **Leakage current:** < 3,5 mA acc. to EN 60950-1
– **Cable exit:** Variable
– **Protection class:** I
– **Product conforming to standard:** EN 60335-1
– **Approvals:** VDE, UL, CSA, CCC, GOST are applied for

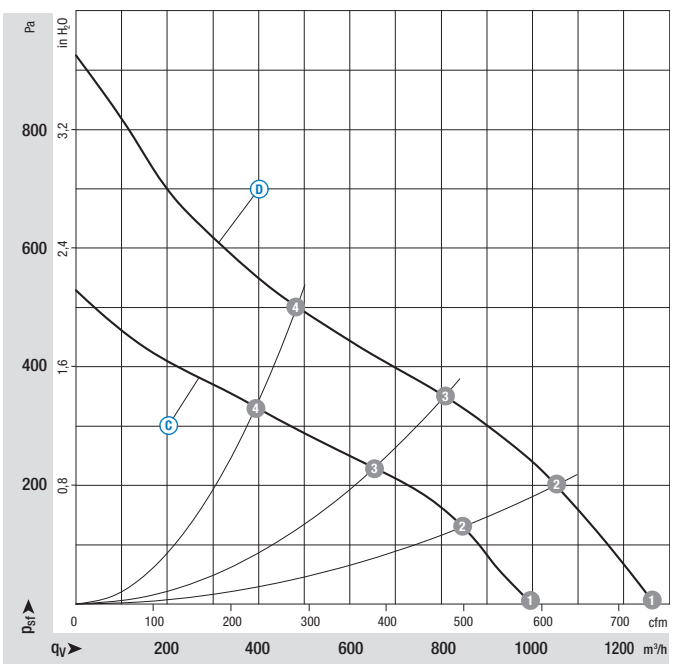
Mass of centrifugal fan



Mass of centrifugal module with support basket

Centrifugal fan	kg	Centrifugal module	kg
R3G 220-RC05 -01	1,13	**K3G 220-RC05 -01**	2,03
R3G 220-RD21 -01	1,53	**K3G 220-RD21 -01**	2,43
R3G 220-RC05 -03	1,20	**K3G 220-RC05 -03**	2,10
R3G 220-RD21 -03	1,53	**K3G 220-RD21 -03**	2,43

Curves (Speed-controlled)



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 measurment 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!

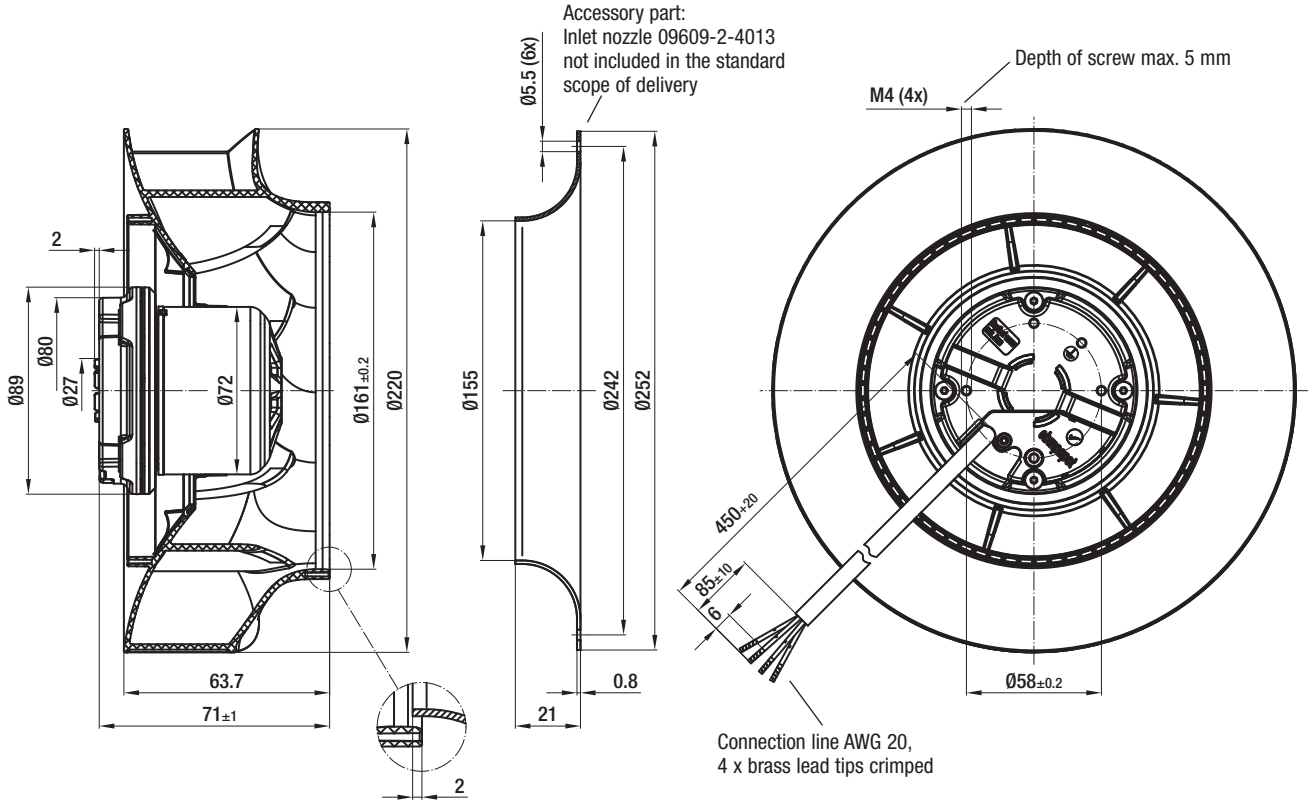
For detailed information see page 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
Ⓒ	1	2765	79	0,67	71
Ⓒ	2	2700	84	0,69	67
Ⓒ	3	2580	85	0,70	65
Ⓒ	4	2635	85	0,70	67
Ⓓ	1	3490	161	1,29	76
Ⓓ	2	3350	166	1,35	72
Ⓓ	3	3210	170	1,35	69
Ⓓ	4	3240	165	1,35	71

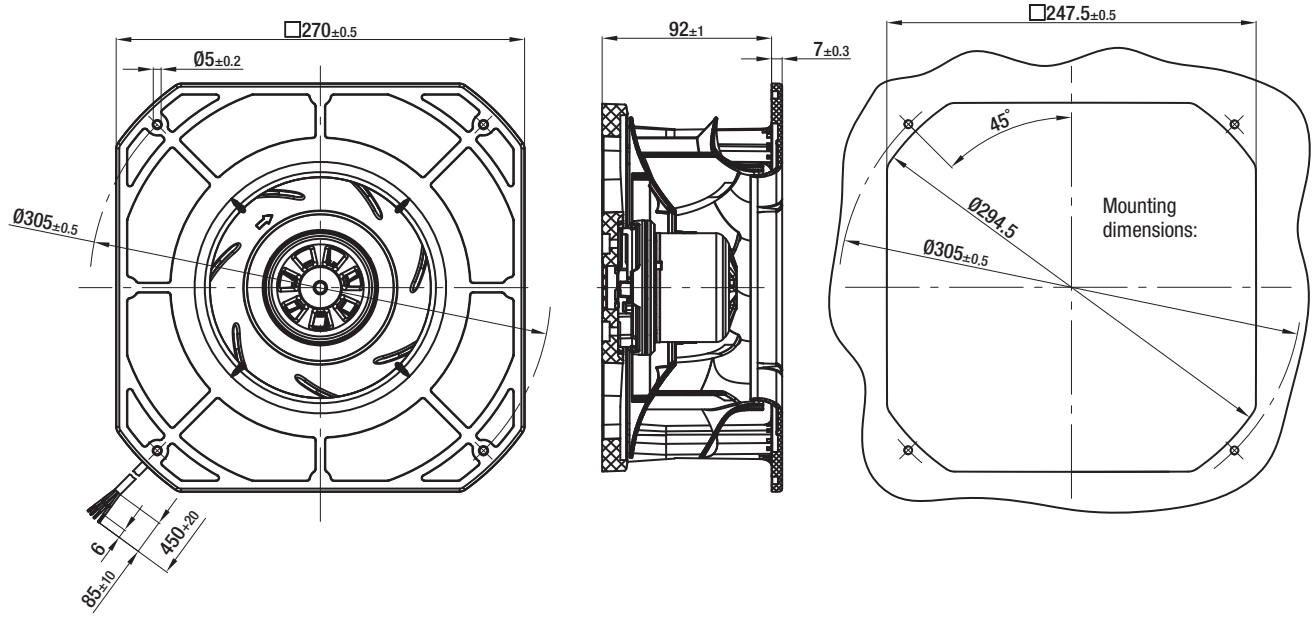
EC centrifugal fans RadiCal

backward curved, Ø 220, 2 Speed stages, 85 W

R3G 220-RC05-01



K3G 220-RC05-01



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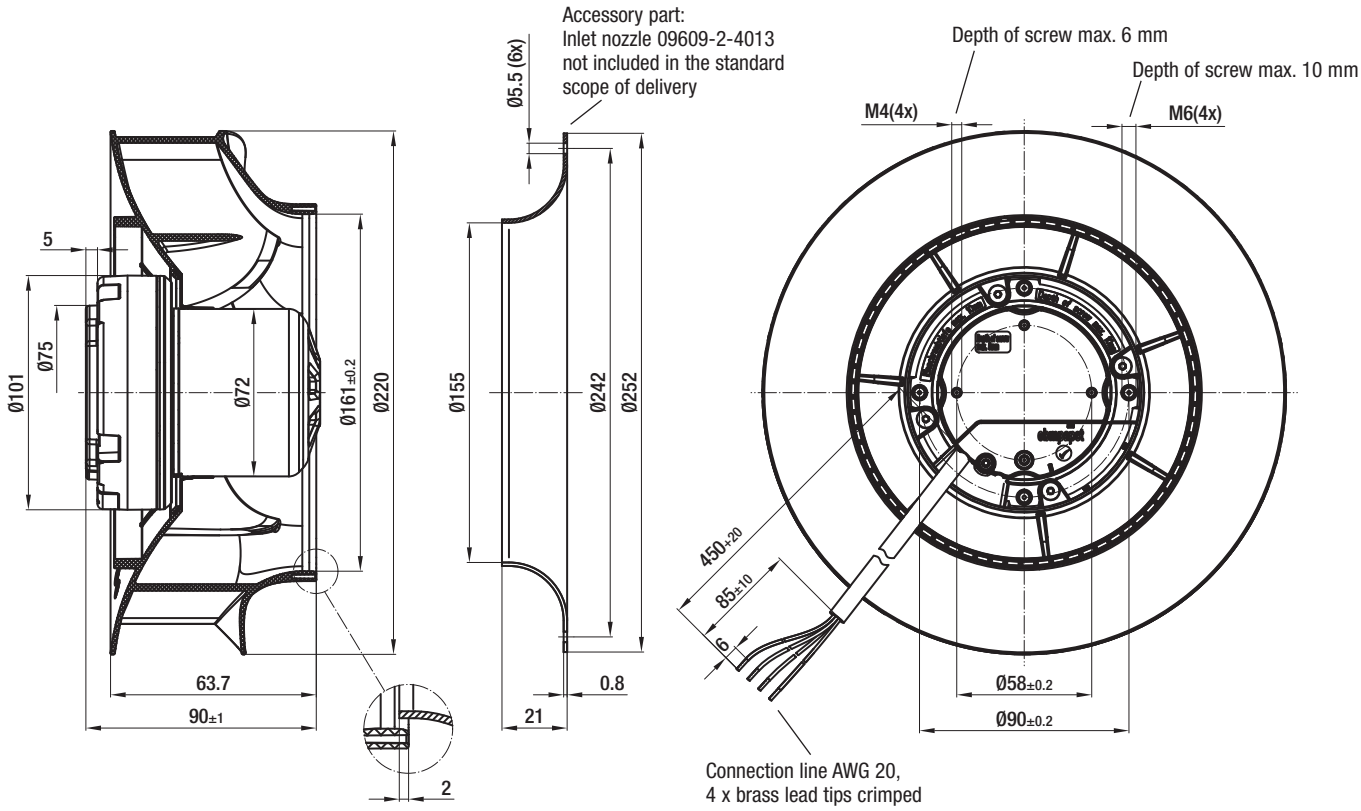
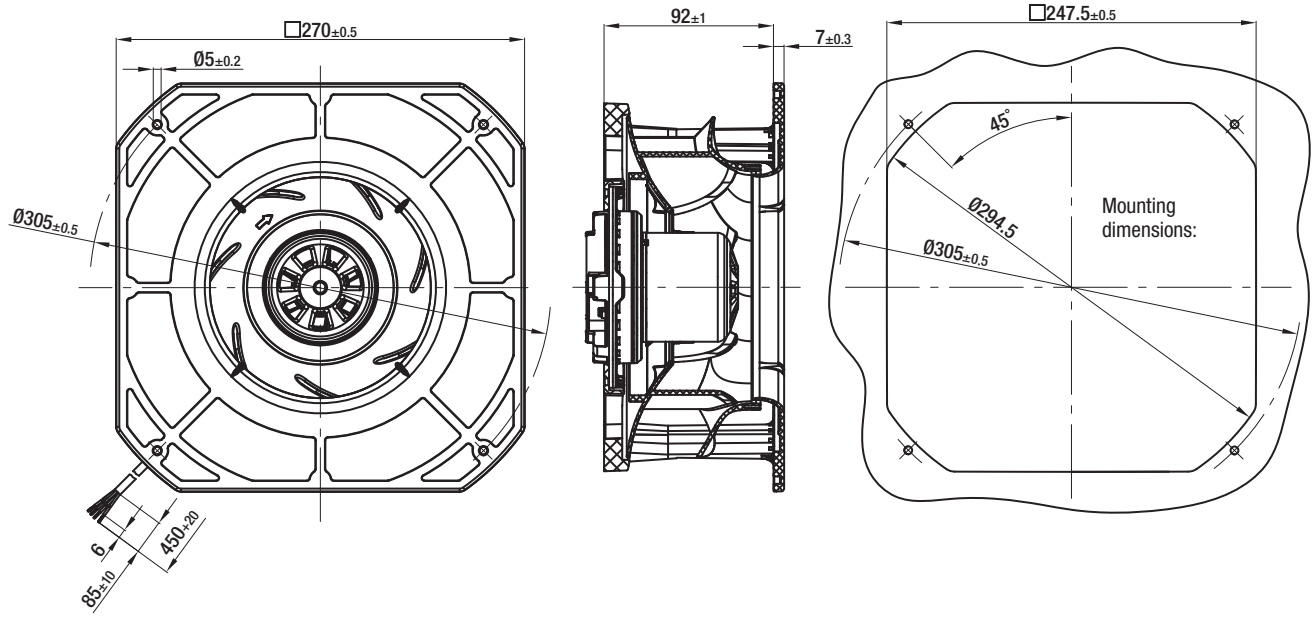
EC centrifugal fans RadiCal

backward curved, Ø 220, 2 Speed stages, 170 W

R3G 220-RD21-01



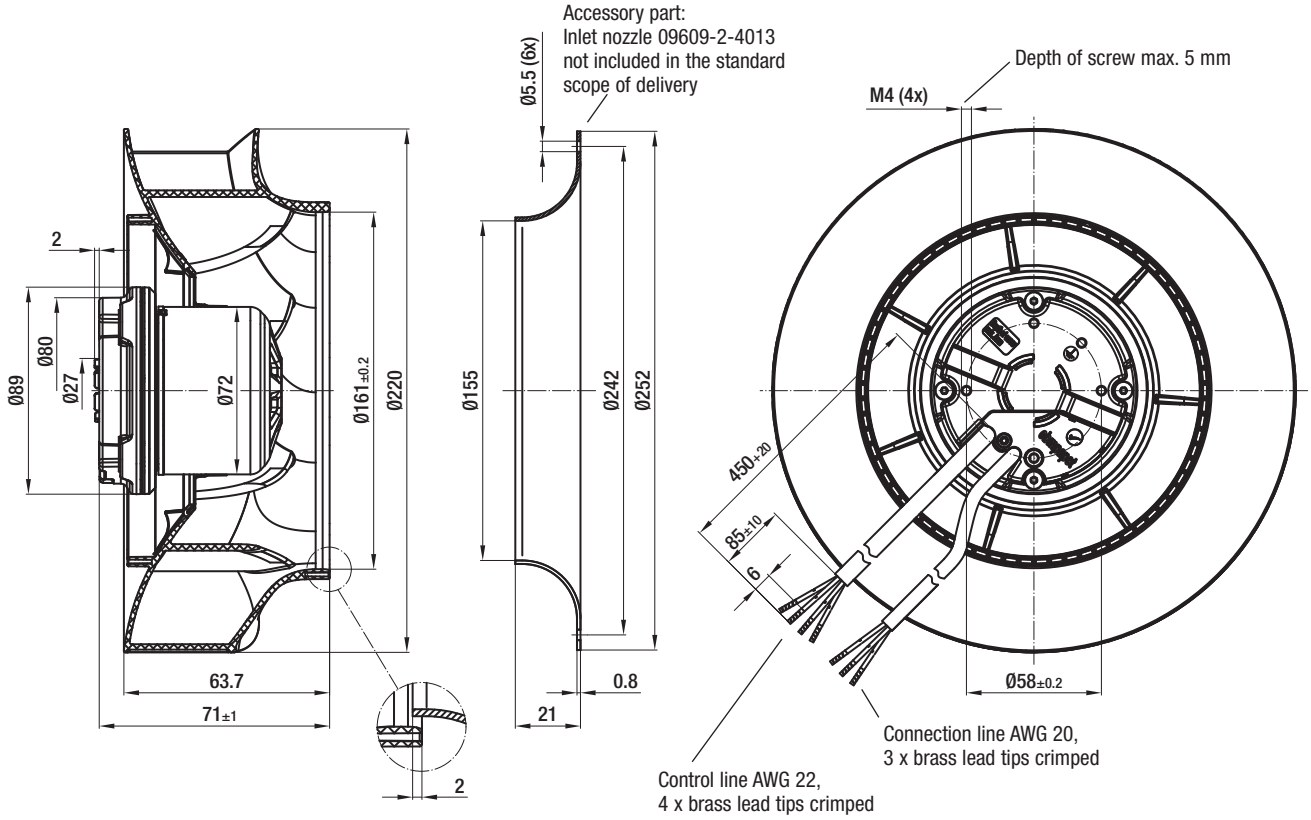
K3G 220-RD21-01



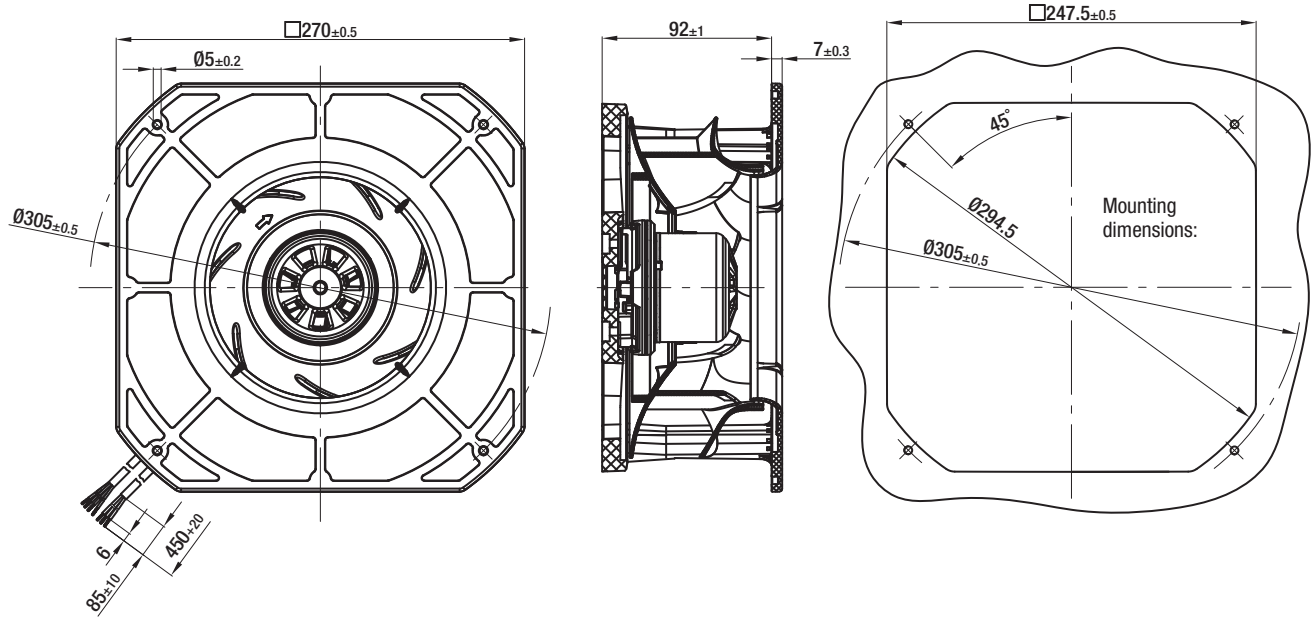
EC centrifugal fans RadiCal

backward curved, Ø 220, Speed-controlled, 85 W

R3G 220-RC05-03



K3G 220-RC05-03

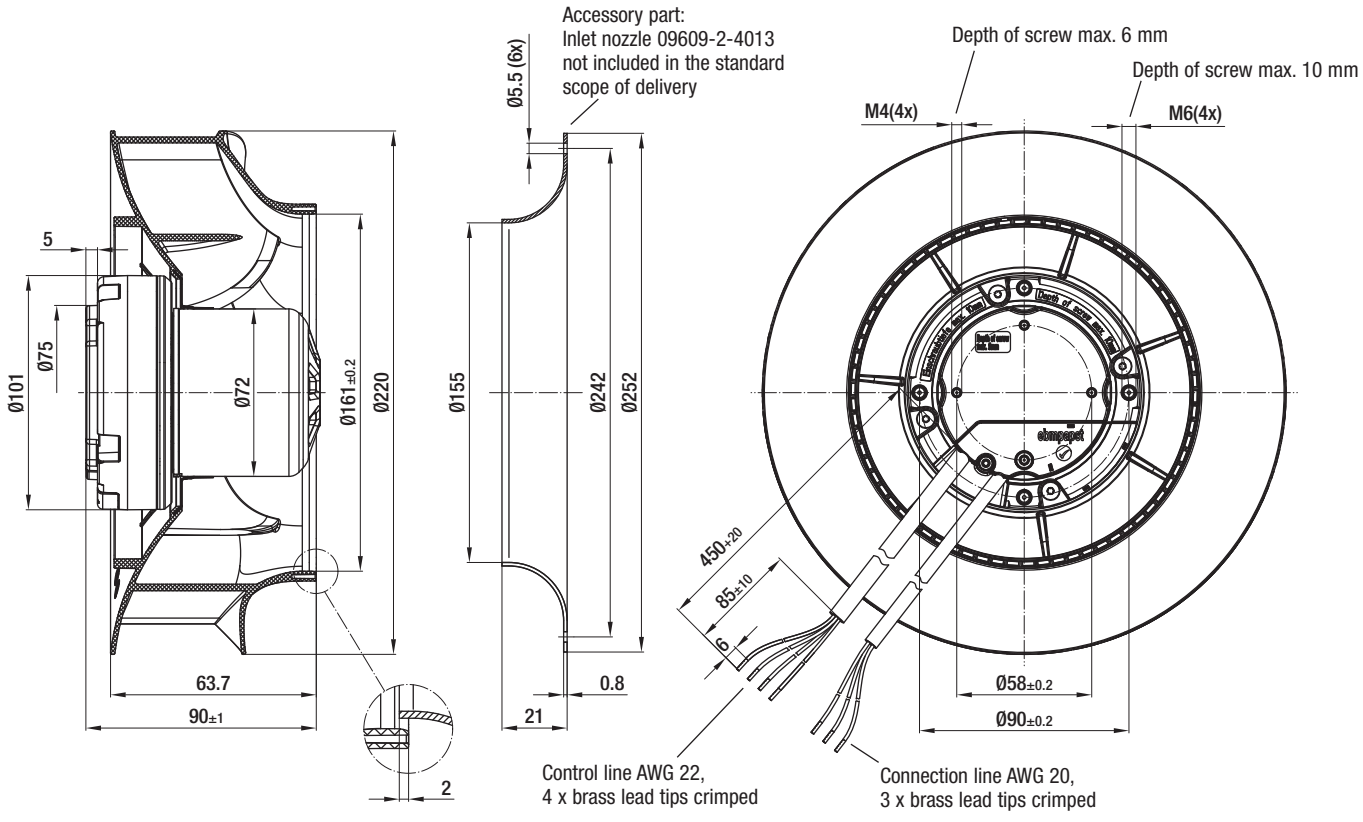


ebmpapst

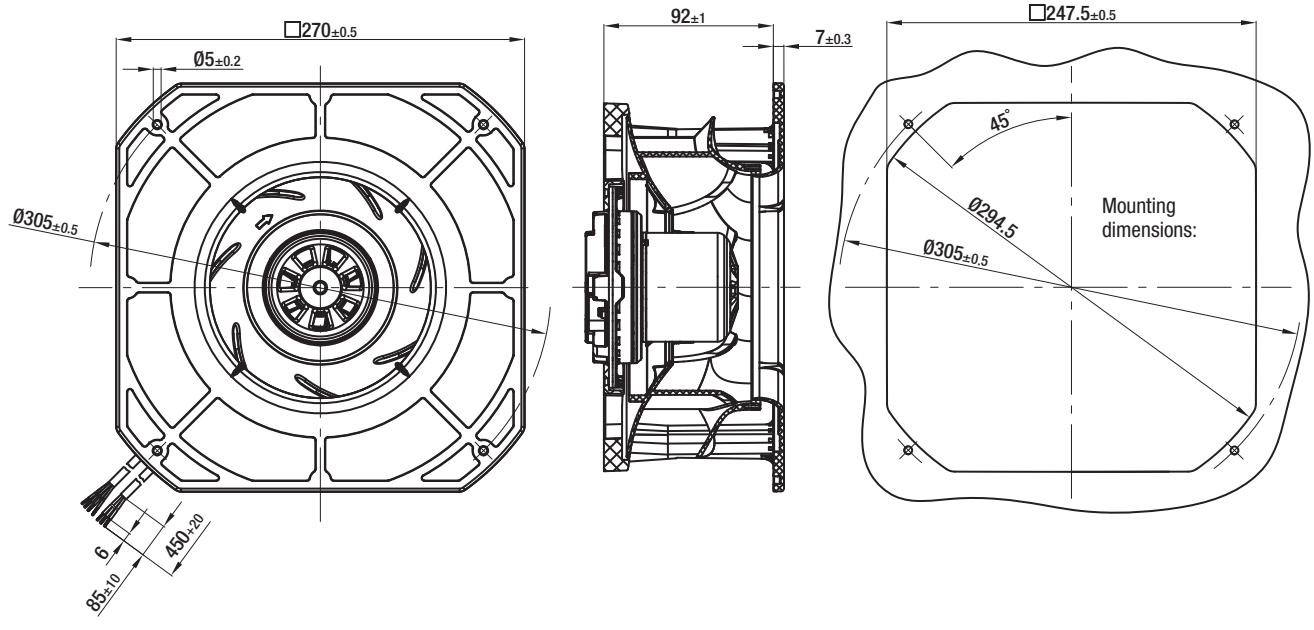
EC centrifugal fans RadiCal

backward curved, Ø 220, Speed-controlled, 170 W

R3G 220-RD21-03



K3G 220-RD21-03



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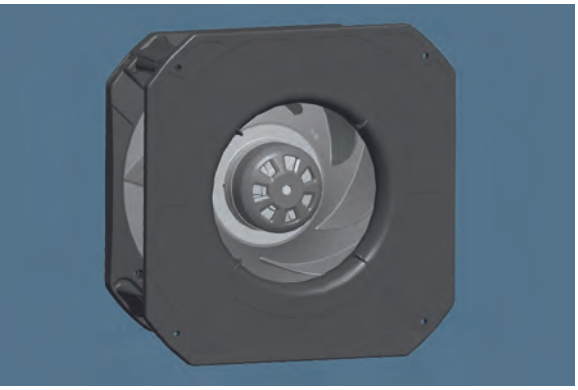
EC centrifugal fans RadiCal

backward curved, Ø 225



- **Material:** Housing: Plastic PA 6, fibreglass-reinforced
  Impeller: Plastic PA 6, fibreglass-reinforced
  Rotor: Thick layer passivated
  Electronics housing: Die-cast alumimium
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 54
- **Insulation class:** "B"
- **Mounting position:** Any
- **Condensate discharges:** None, open rotor
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

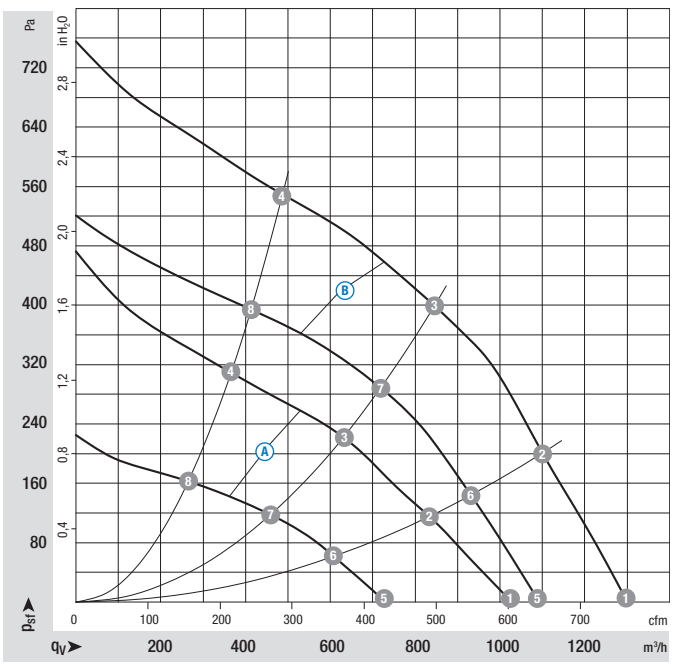
Nominal data

Type	Motor	Curve	Nominal voltage range	Frequency	Speed/rpm(1)	Max. input power(1)	Max. current draw(1)	Perm. amb. temp.	Electr. connection
			VAC	Hz	rpm	W	A	°C	p. 64/65
*3G 225	M3G 055-CF	A	1~ 200-240	50/60	2200	82	0,70	-25..+60	H3)
*3G 225	M3G 055-DF	B	1~ 200-240	50/60	2900	170	1,45	-25..+60	H3)
*3G 225	M3G 055-CF	C	1~ 200-240	50/60	2200	82	0,70	-25..+60	H4)
*3G 225	M3G 055-DF	D	1~ 200-240	50/60	2900	170	1,45	-25..+60	H4)

subject to alterations

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

Curves (2 Speed stages)



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 measurment 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!

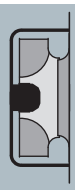
For detailed information see page 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
A	1	2290	70	0,62	69
A	2	2170	77	0,66	65
A	3	2200	82	0,70	60
A	4	2225	73	0,63	66
A	5	1640	27	0,28	61
A	6	1585	31	0,31	58
A	7	1590	31	0,32	53
A	8	1630	28	0,29	58
B	1	3030	151	1,25	78
B	2	2910	168	1,40	74
B	3	2900	170	1,45	68
B	4	2970	157	1,35	73
B	5	2550	91	0,83	74
B	6	2495	104	0,94	70
B	7	2490	105	0,93	65
B	8	2525	97	0,89	69

ebmpapst

– **Technical features** Ⓐ Ⓑ **:** • Speed adjustment input (230V) • Electronics / motor overtemperature protection • Motor current limitation • Locked rotor protection • Soft start
– **Technical features** Ⓒ Ⓓ **:** • Control input 0-10 VDC / PWM • Output 10 VDC max. 1,1 mA • Tach output • Electronics / motor overtemperature protection • Motor current limitation • Locked rotor protection • Soft start
– **EMC:** Interference emission acc. to EN 61000-6-3
Interference immunity acc. to EN 61000-6-2
Harmonics acc. to EN 61000-3-2/3
– **Leakage current:** < 3,5 mA acc. to EN 60950-1
– **Cable exit:** Variable
– **Protection class:** I
– **Product conforming to standard:** EN 60335-1
– **Approvals:** VDE, UL, CSA, CCC, GOST are applied for

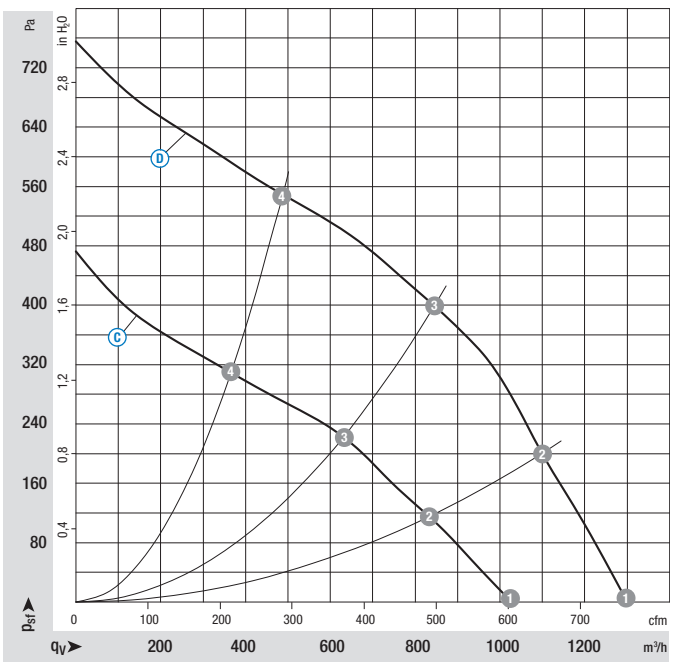
Mass of centrifugal fan



Mass of centrifugal module with support basket

Centrifugal fan	kg	Centrifugal module	kg
R3G 225-RD05 -01	1,40	**K3G 225-RD05 -01**	2,00
R3G 225-RE07 -01	1,60	**K3G 225-RE07 -01**	2,20
R3G 225-RD05 -03	1,40	**K3G 225-RD05 -03**	2,00
R3G 225-RE07 -03	1,60	**K3G 225-RE07 -03**	2,20

Curves (Speed-controlled)



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 measurment 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 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
Ⓒ	1	2290	70	0,62	69
Ⓒ	2	2170	77	0,66	65
Ⓒ	3	2200	82	0,70	60
Ⓒ	4	2225	73	0,63	66
Ⓓ	1	3030	151	1,25	78
Ⓓ	2	2910	168	1,40	74
Ⓓ	3	2900	170	1,45	68
Ⓓ	4	2970	157	1,35	73

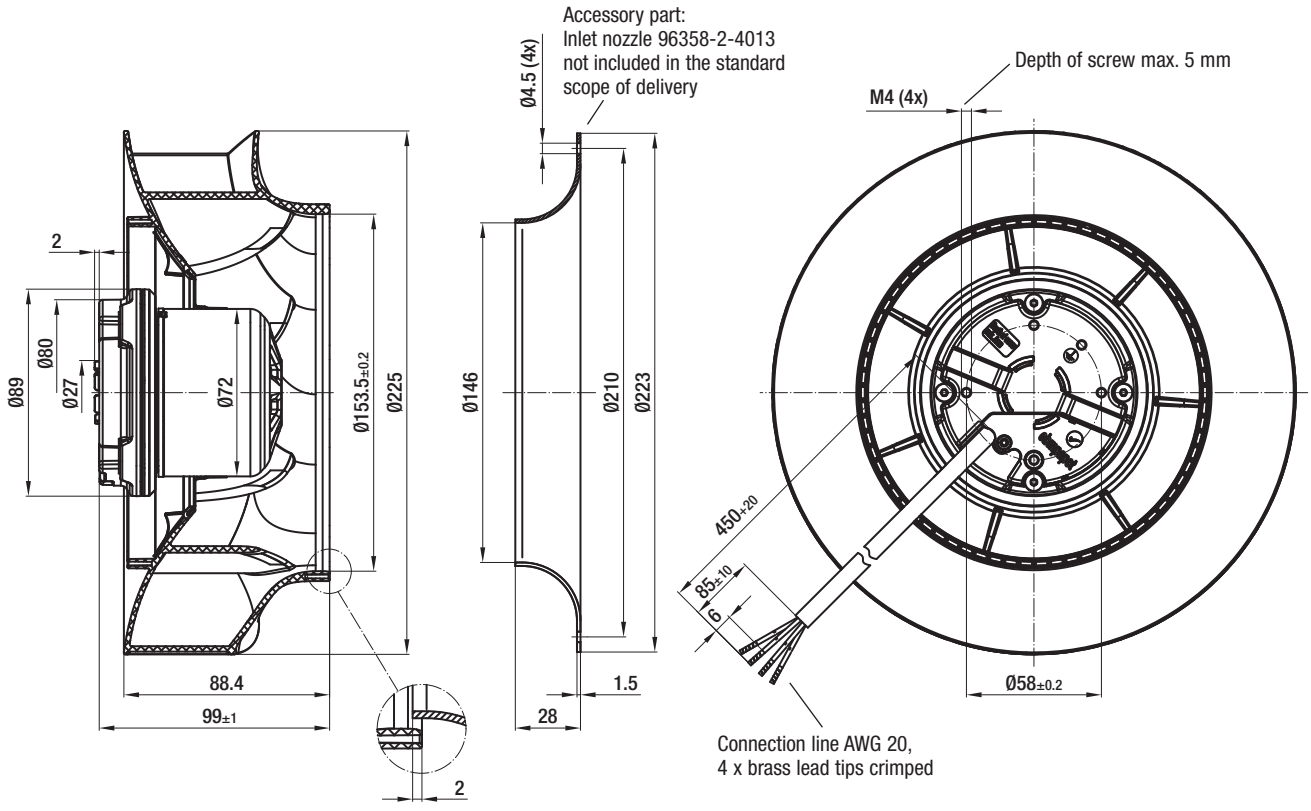
Drawings p. 26 ff.

Electr.connection p. 64/65

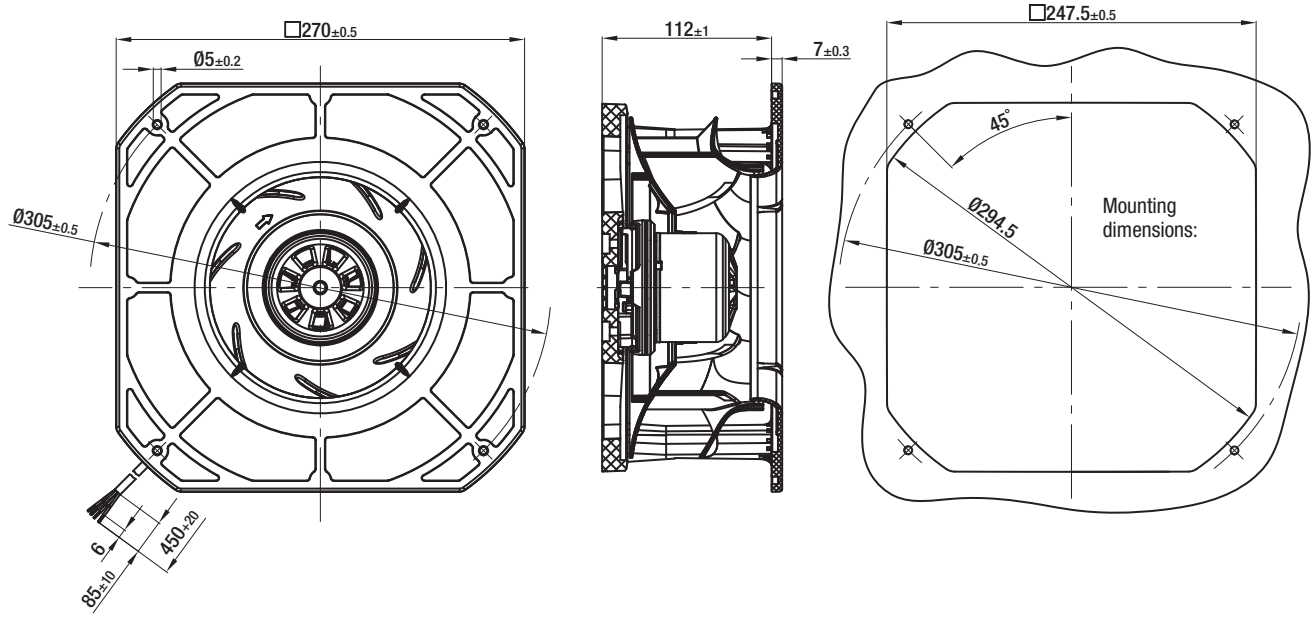
EC centrifugal fans RadiCal

backward curved, Ø 225, 2 Speed stages, 85 W

R3G 225-RD05-01



K3G 225-RD05-01



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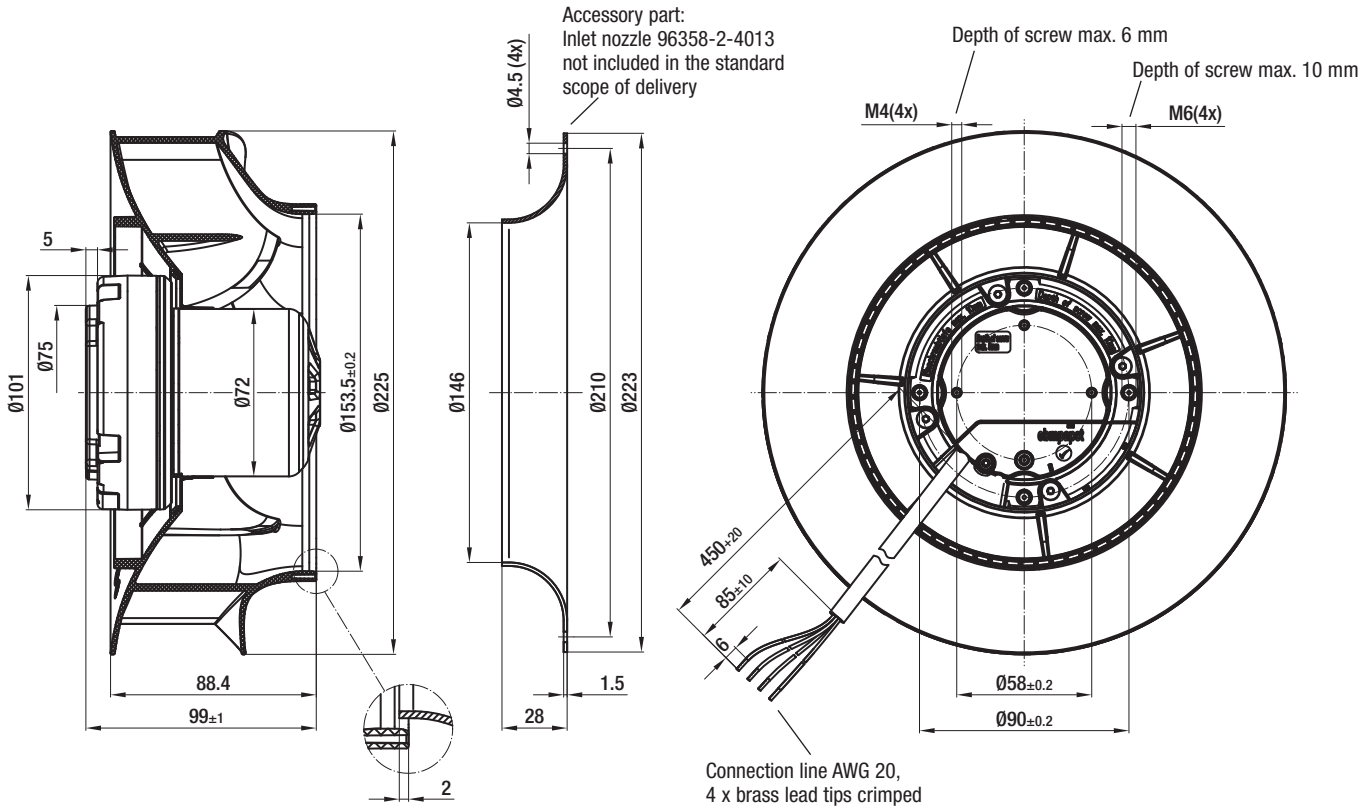
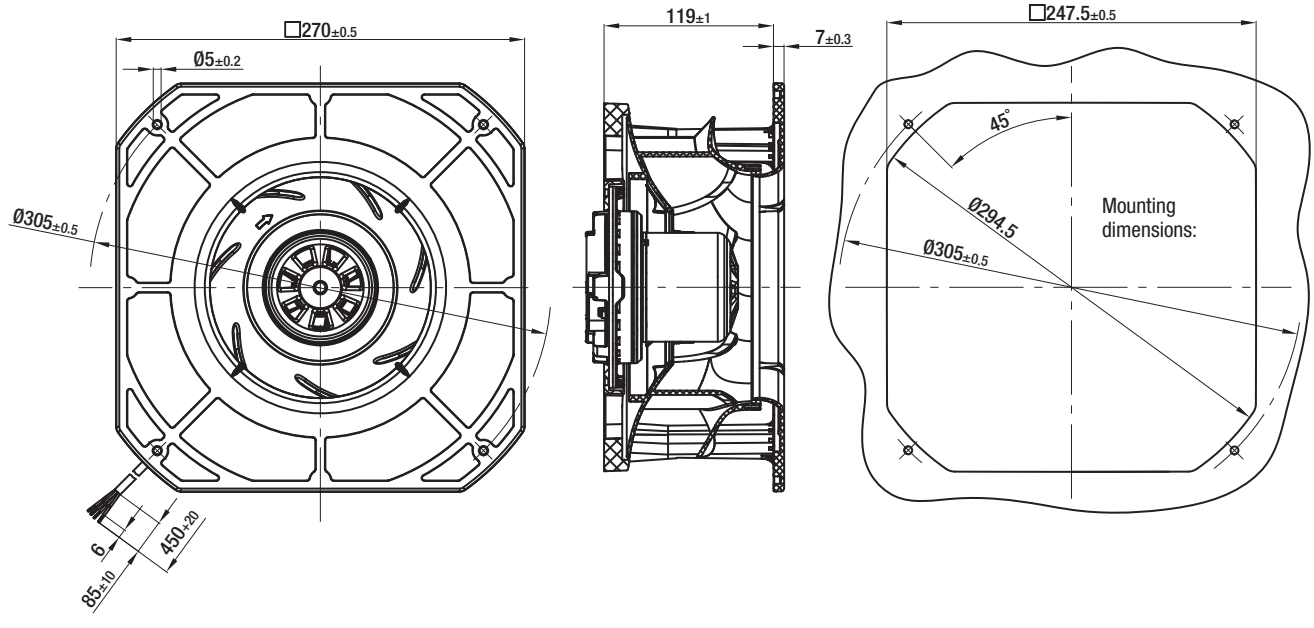
EC centrifugal fans RadiCal

backward curved, Ø 225, 2 Speed stages, 170 W

R3G 225-RE07-01



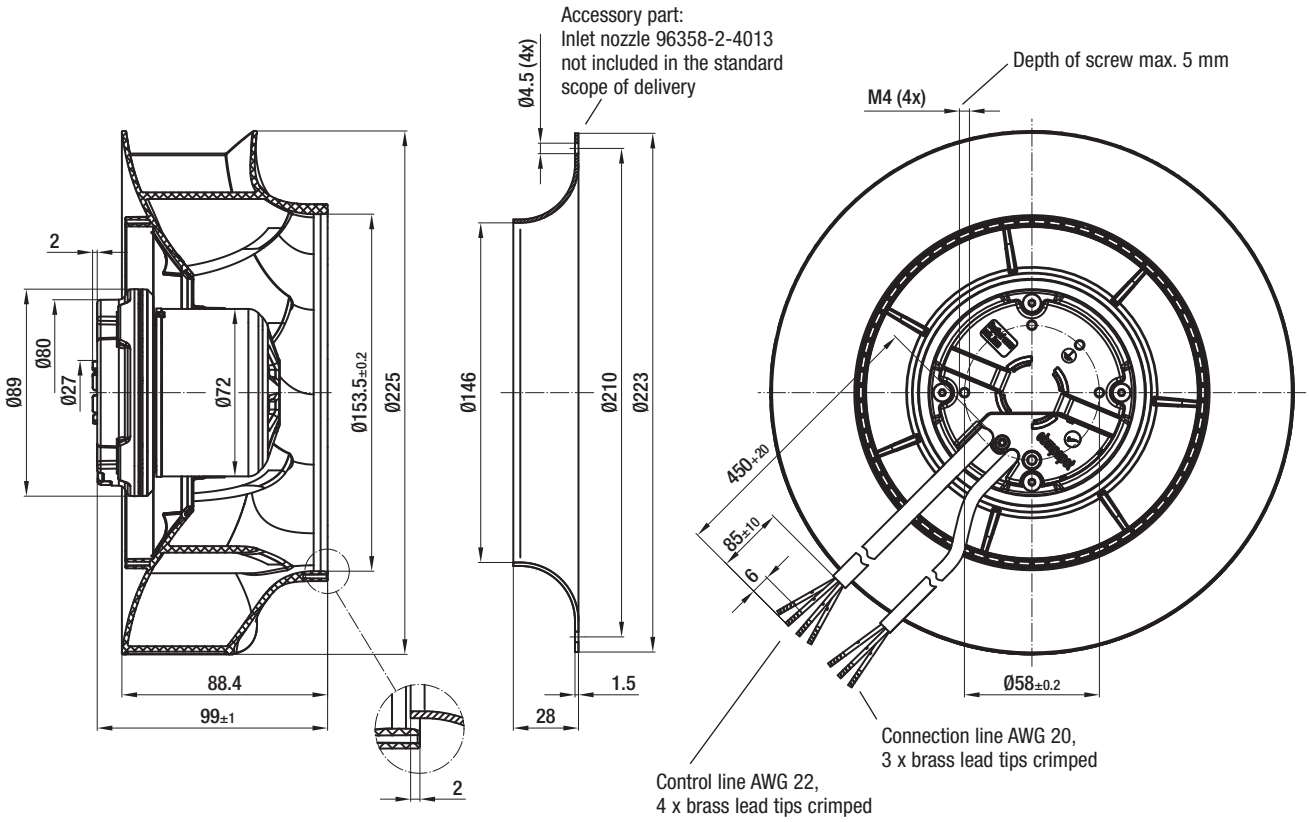
K3G 225-RE07-01



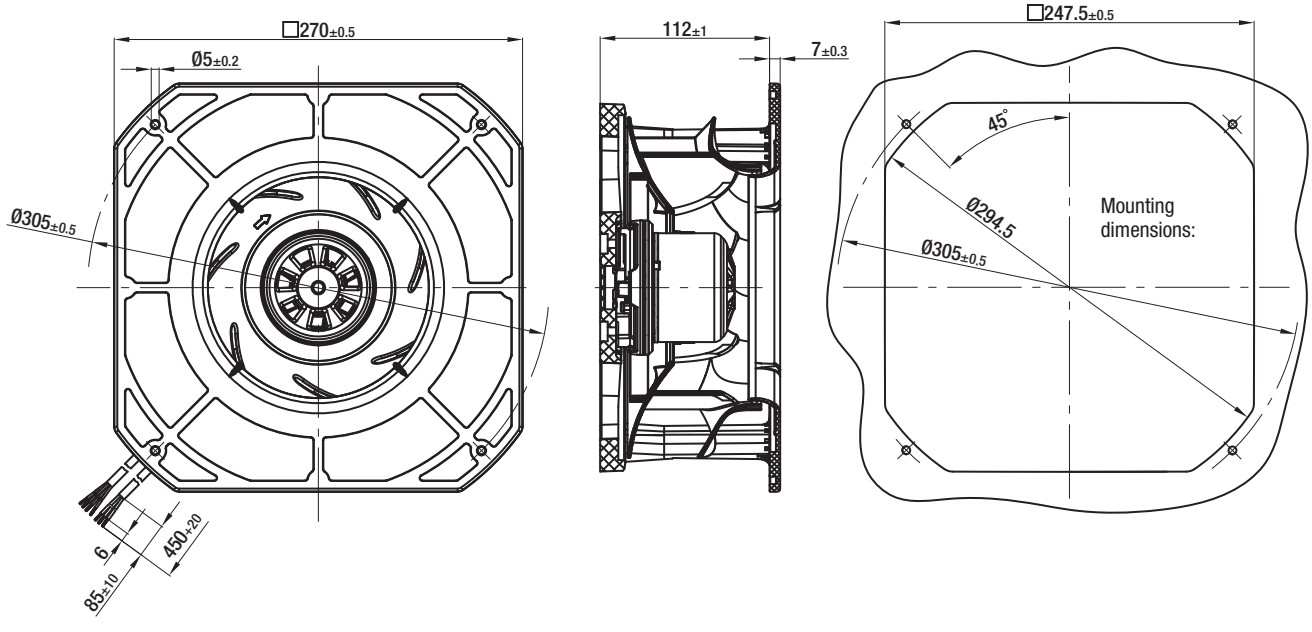
EC centrifugal fans RadiCal

backward curved, Ø 225, Speed-controlled, 85 W

R3G 225-RD05-03



K3G 225-RD05-03



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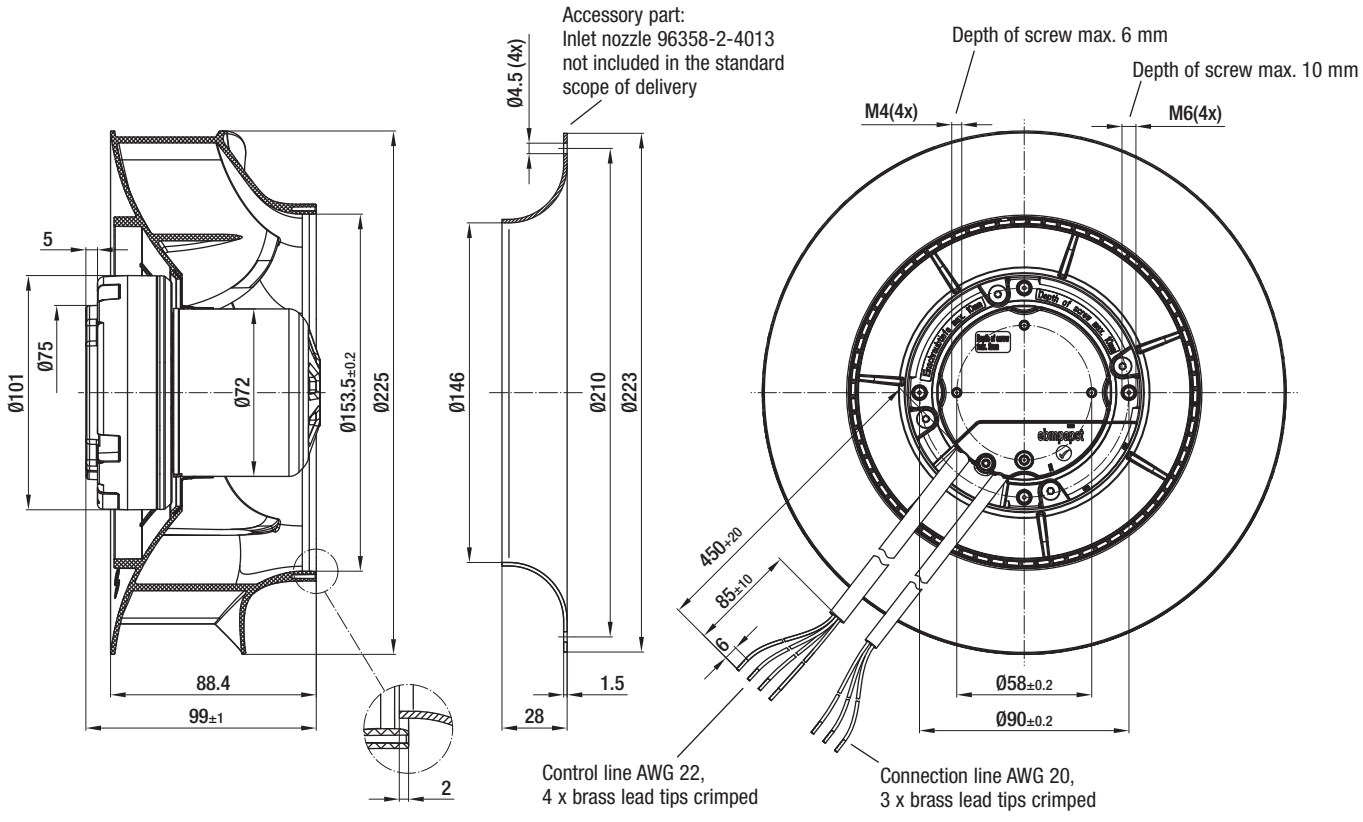
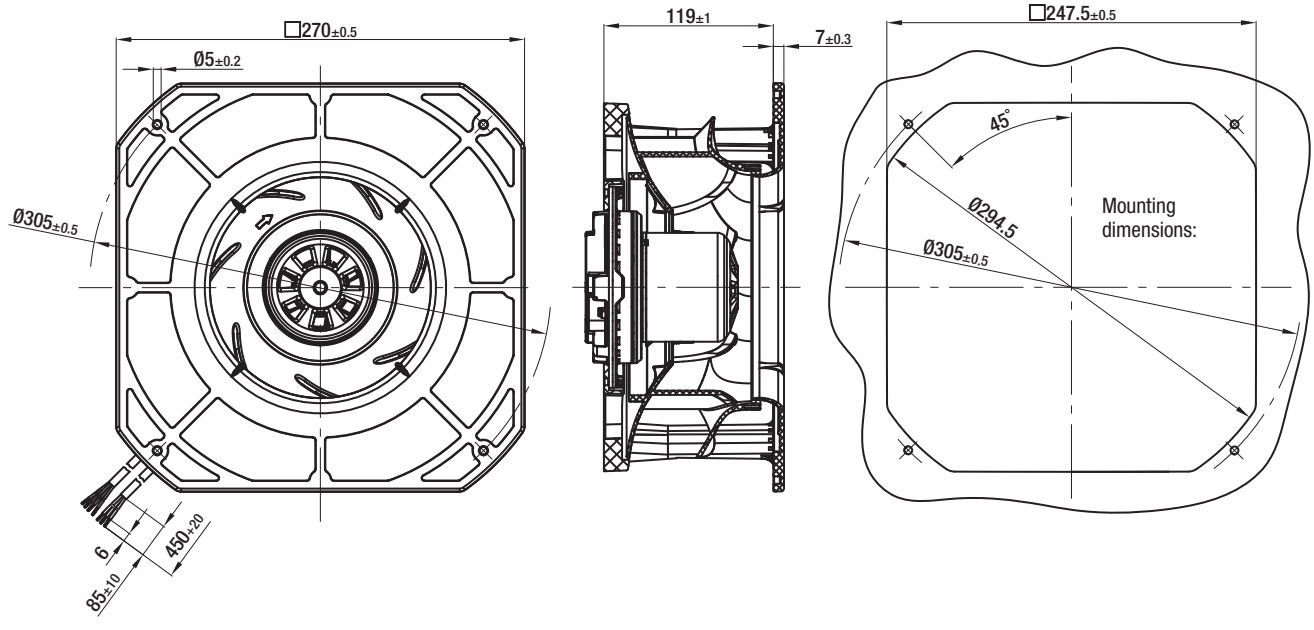
EC centrifugal fans RadiCal

backward curved, Ø 225, Speed-controlled, 170 W

R3G 225-RE07-03



K3G 225-RE07-03



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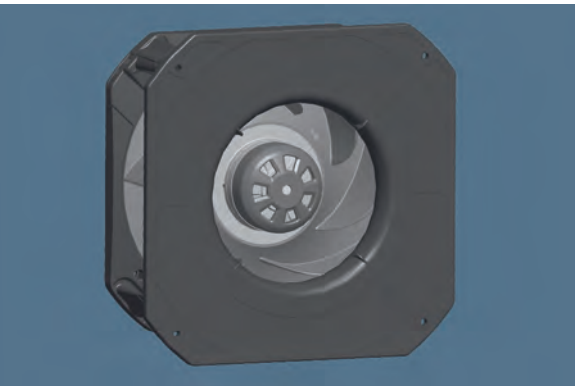
EC centrifugal fans RadiCal

backward curved, Ø 250



- **Material:** Housing: Plastic PA 6, fibreglass-reinforced
  Impeller: Plastic PA 6, fibreglass-reinforced
  Rotor: Thick layer passivated
  Electronics housing: Die-cast alumimium
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 54
- **Insulation class:** "B"
- **Mounting position:** Any
- **Condensate discharges:** None, open rotor
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

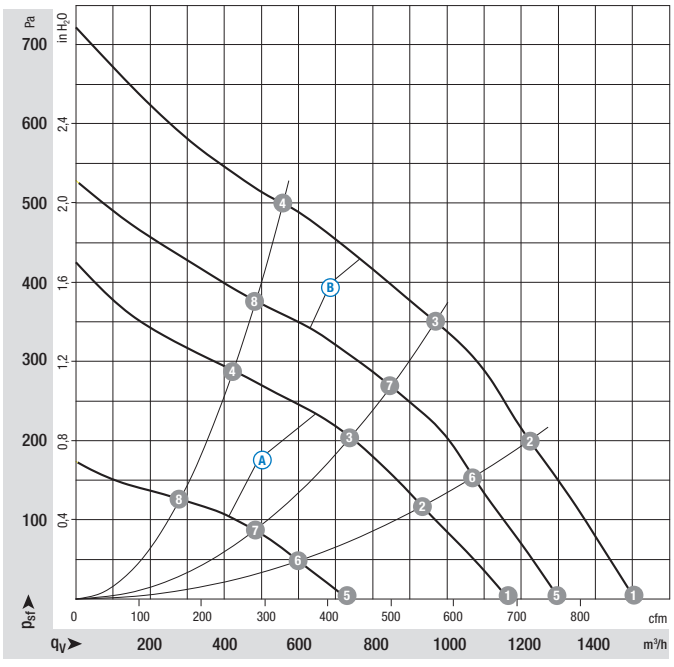
Nominal data

Type	Motor	Curve	Nominal voltage range	Frequency	Speed/rpm(1)	Max. input power(1)	Max. current draw(1)	Perm. amb. temp.	Electr. connection
			VAC	Hz	rpm	W	A	°C	p. 64/65
*3G 250	M3G 055-CF	A	1~ 200-240	50/60	1950	85	0,69	-25..+60	H3)
*3G 250	M3G 055-DF	B	1~ 200-240	50/60	2550	170	1,35	-25..+60	H3)
*3G 250	M3G 055-CF	C	1~ 200-240	50/60	1950	85	0,69	-25..+60	H4)
*3G 250	M3G 055-DF	D	1~ 200-240	50/60	2550	170	1,35	-25..+60	H4)

subject to alterations

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

Curves (2 Speed stages)



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 measurment 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!

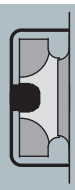
For detailed information see page 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
A	1	2050	70	0,60	69
A	2	1965	82	0,68	66
A	3	1950	85	0,69	61
A	4	1990	78	0,65	66
A	5	1325	22	0,23	60
A	6	1290	26	0,26	57
A	7	1290	26	0,28	53
A	8	1330	26	0,26	57
B	1	2680	146	1,17	76
B	2	2565	170	1,35	71
B	3	2550	170	1,35	67
B	4	2610	160	1,28	73
B	5	2330	96	0,80	72
B	6	2265	112	0,92	67
B	7	2250	116	0,96	64
B	8	2285	109	0,93	68

ebmpapst

– **Technical features** Ⓐ Ⓑ **:** • Speed adjustment input (230V) • Electronics / motor overtemperature protection • Motor current limitation • Locked rotor protection • Soft start
– **Technical features** Ⓒ Ⓓ **:** • Control input 0-10 VDC / PWM • Output 10 VDC max. 1,1 mA • Tach output • Electronics / motor overtemperature protection • Motor current limitation • Locked rotor protection • Soft start
– **EMC:** Interference emission acc. to EN 61000-6-3
Interference immunity acc. to EN 61000-6-2
Harmonics acc. to EN 61000-3-2/3
– **Leakage current:** < 3,5 mA acc. to EN 60950-1
– **Cable exit:** Variable
– **Protection class:** I
– **Product conforming to standard:** EN 60335-1
– **Approvals:** VDE, UL, CSA, CCC, GOST are applied for

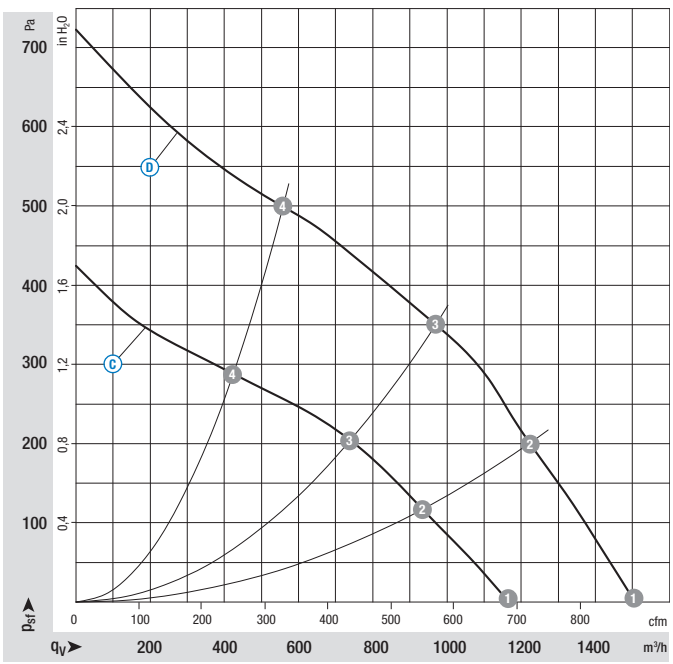
Mass of centrifugal fan



Mass of centrifugal module with support basket

Centrifugal fan	kg	Centrifugal module	kg
R3G 250-RD43 -01	1,50	**K3G 250-RD43 -01**	2,28
R3G 250-RE09 -05	1,91	**K3G 250-RE09 -05**	2,69
R3G 250-RD43 -03	1,50	**K3G 250-RD43 -03**	2,28
R3G 250-RE09 -07	1,91	**K3G 250-RE09 -07**	2,69

Curves (Speed-controlled)



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 measurment 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 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
Ⓒ	1	2050	70	0,60	69
Ⓒ	2	1965	82	0,68	66
Ⓒ	3	1950	85	0,69	61
Ⓒ	4	1990	78	0,65	66
Ⓓ	1	2680	146	1,17	76
Ⓓ	2	2565	170	1,35	71
Ⓓ	3	2550	170	1,35	67
Ⓓ	4	2610	160	1,28	73

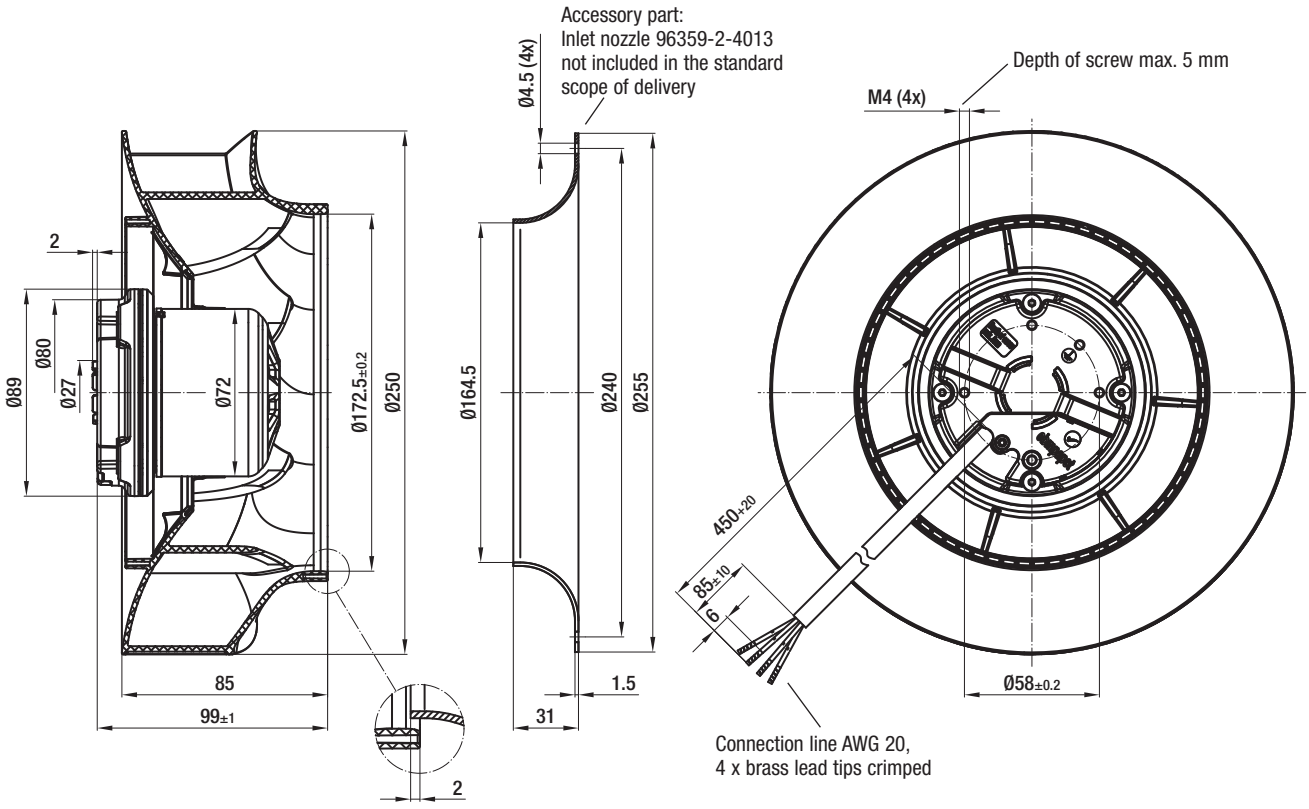
Drawings p. 32 ff.

Electr.connection p. 64/65

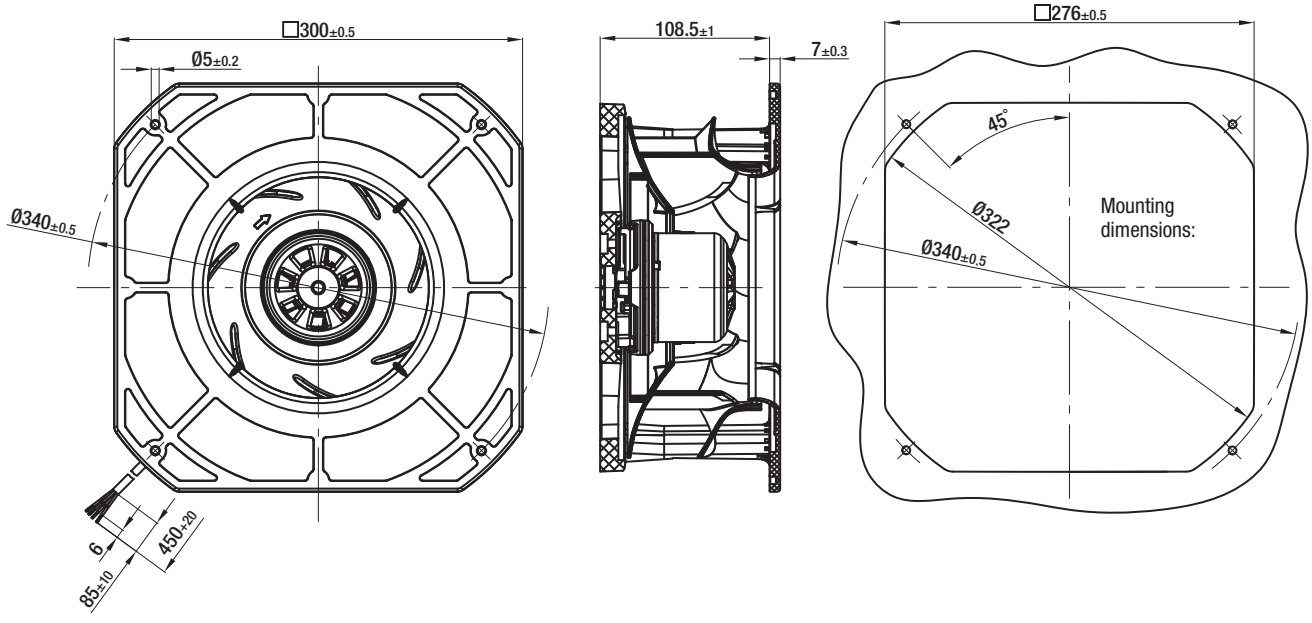
EC centrifugal fans RadiCal

backward curved, Ø 250, 2 Speed stages, 85 W

R3G 250-RD43-01



K3G 250-RD43-01

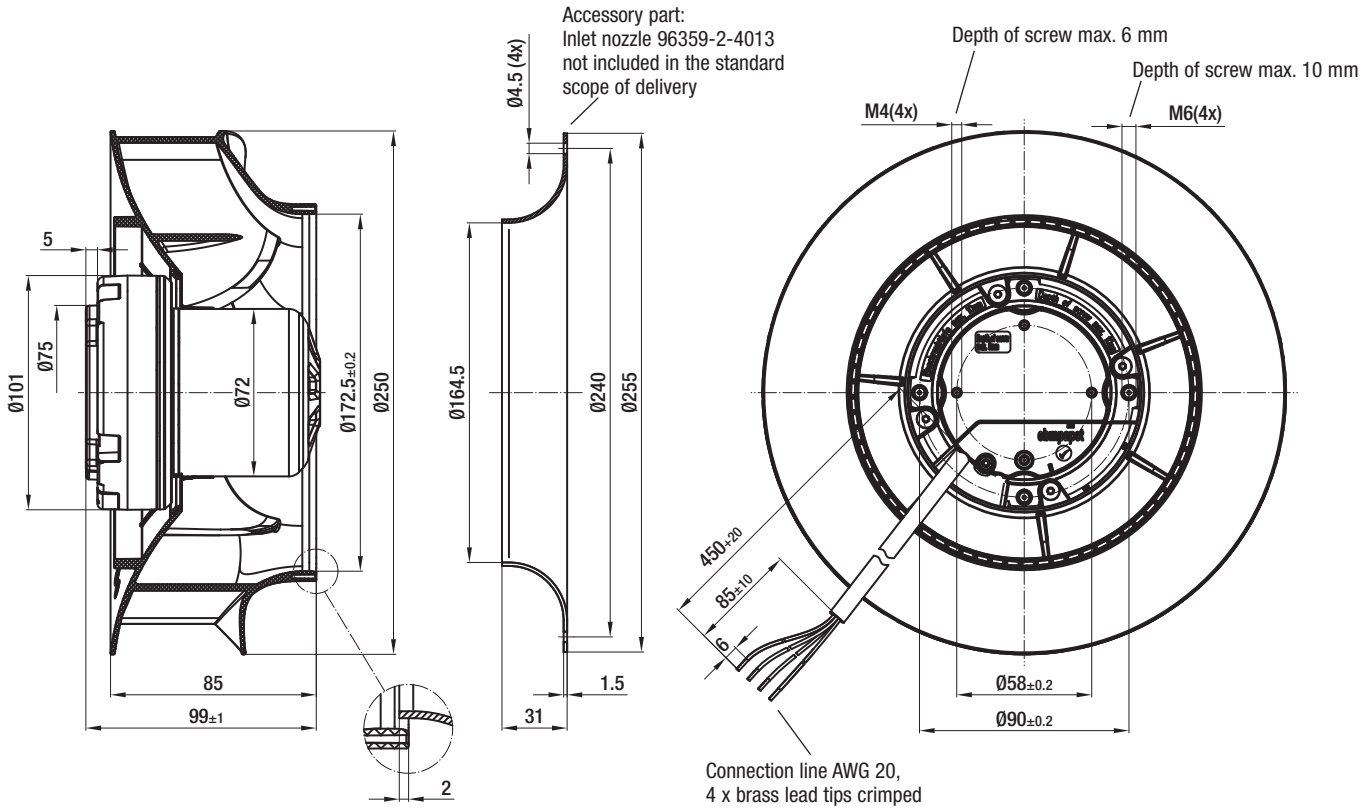


ebmpapst

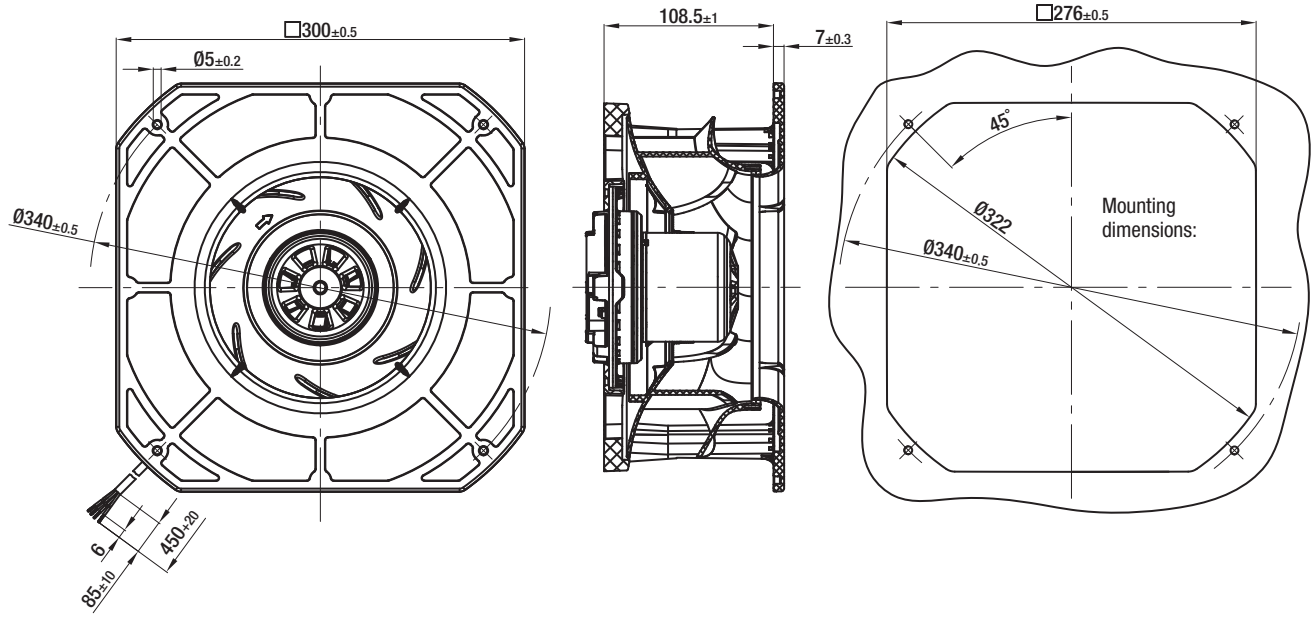
EC centrifugal fans RadiCal

backward curved, Ø 250, 2 Speed stages, 170 W

R3G 250-RE09-05



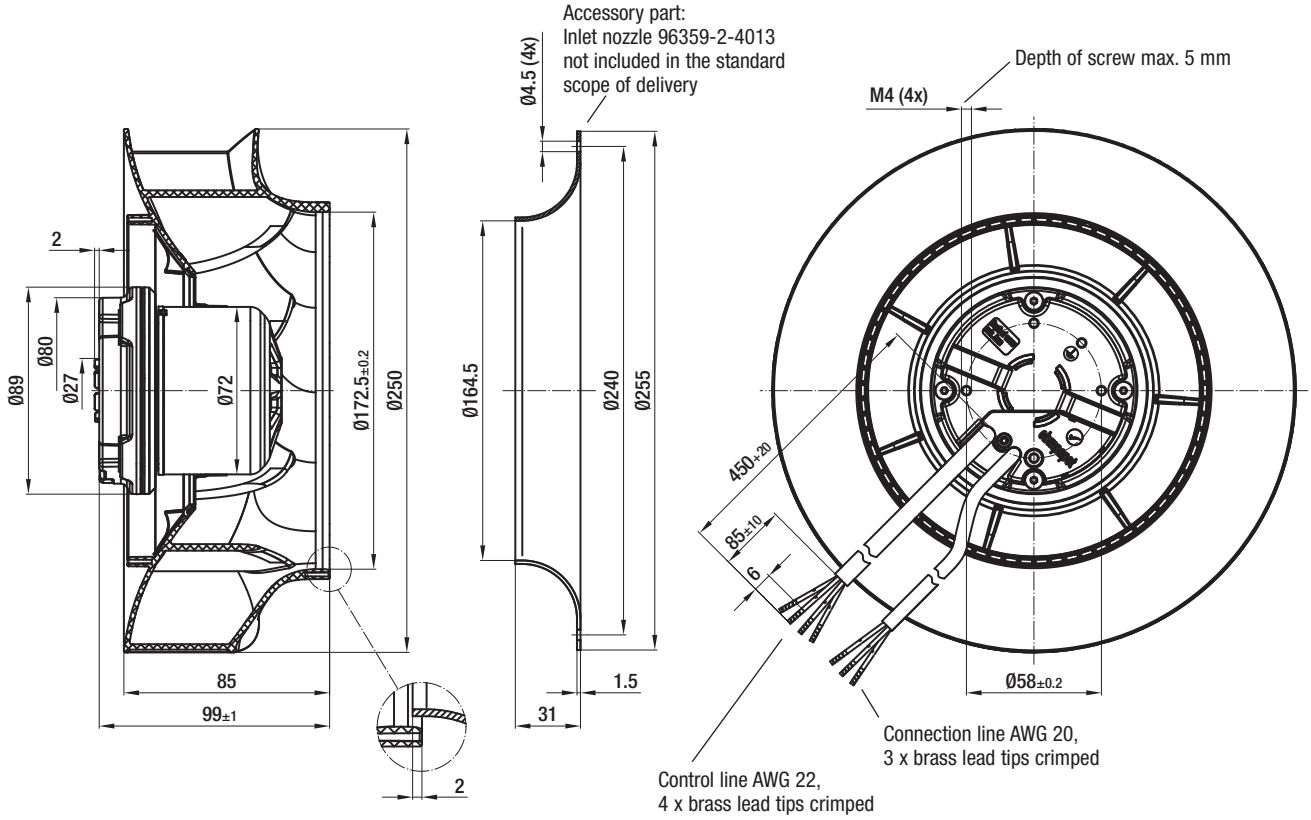
K3G 250-RE09-05



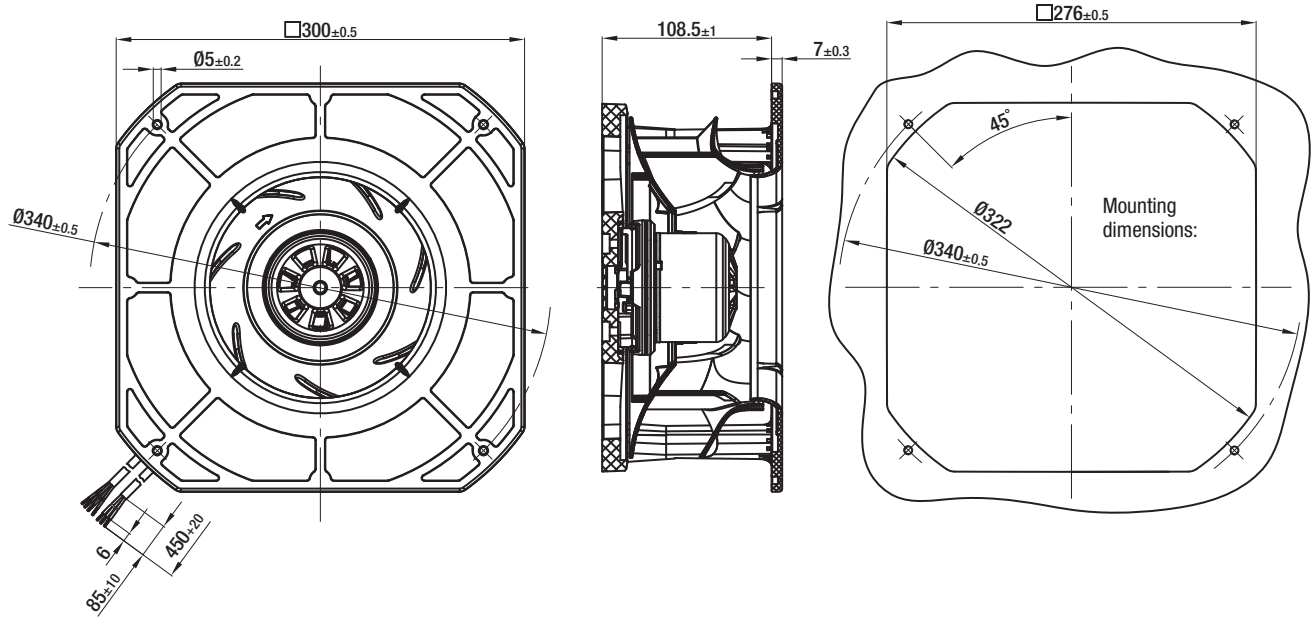
EC centrifugal fans RadiCal

backward curved, Ø 250, Speed-controlled, 85 W

R3G 250-RD43-03



K3G 250-RD43-03

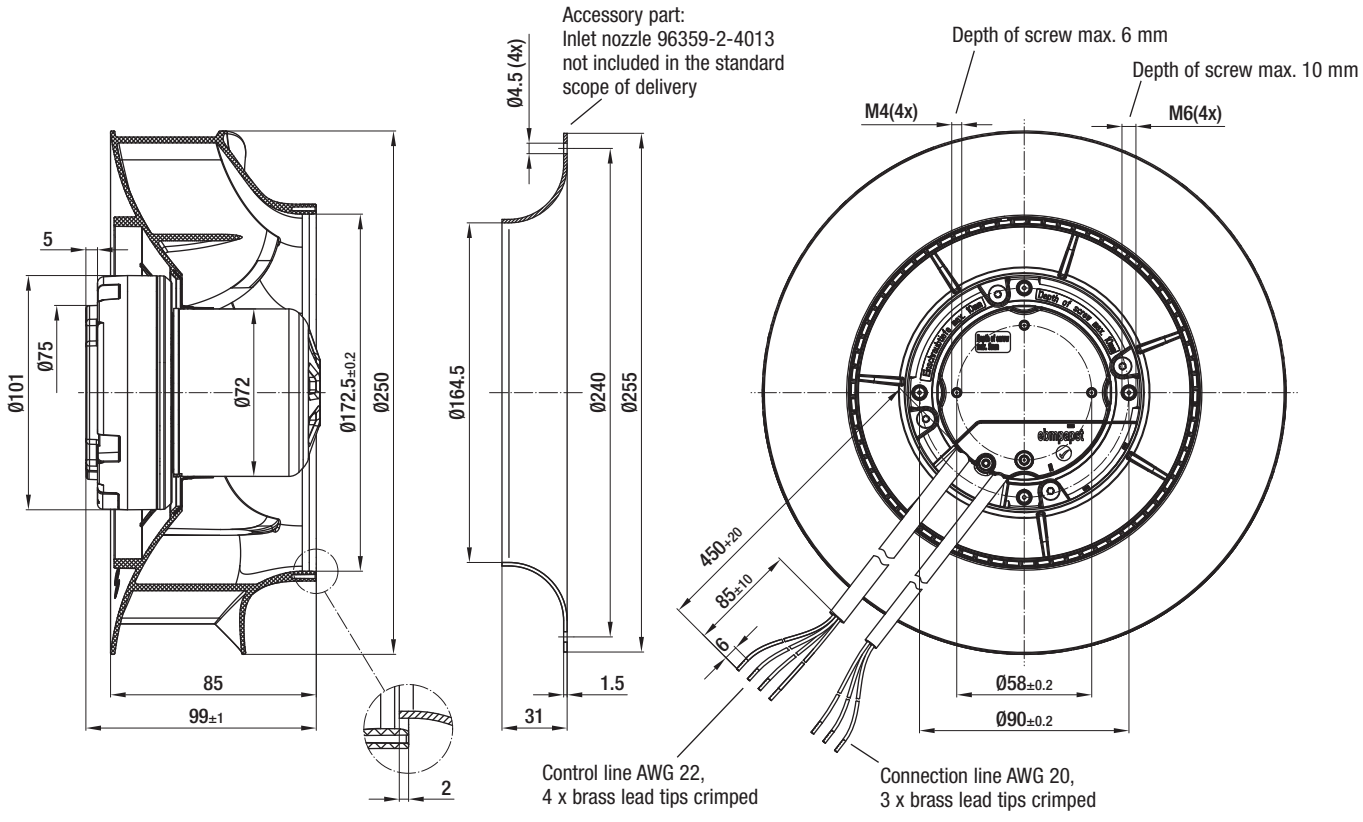


ebmpapst

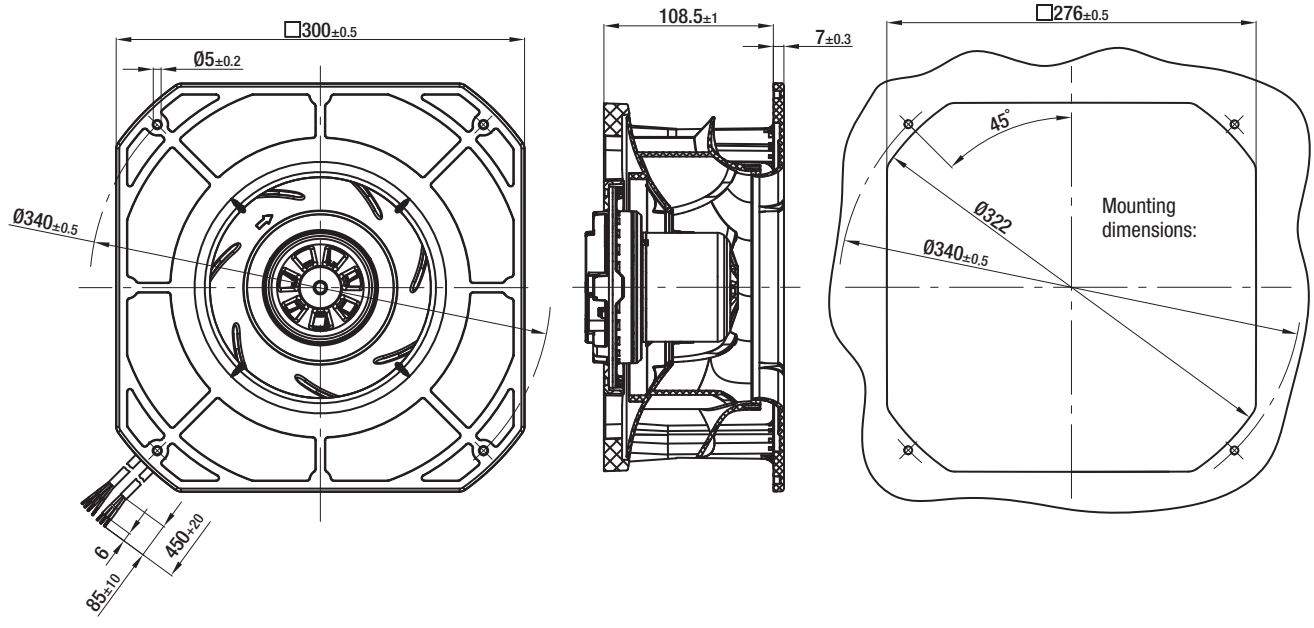
EC centrifugal fans RadiCal

backward curved, Ø 250, Speed-controlled, 170 W

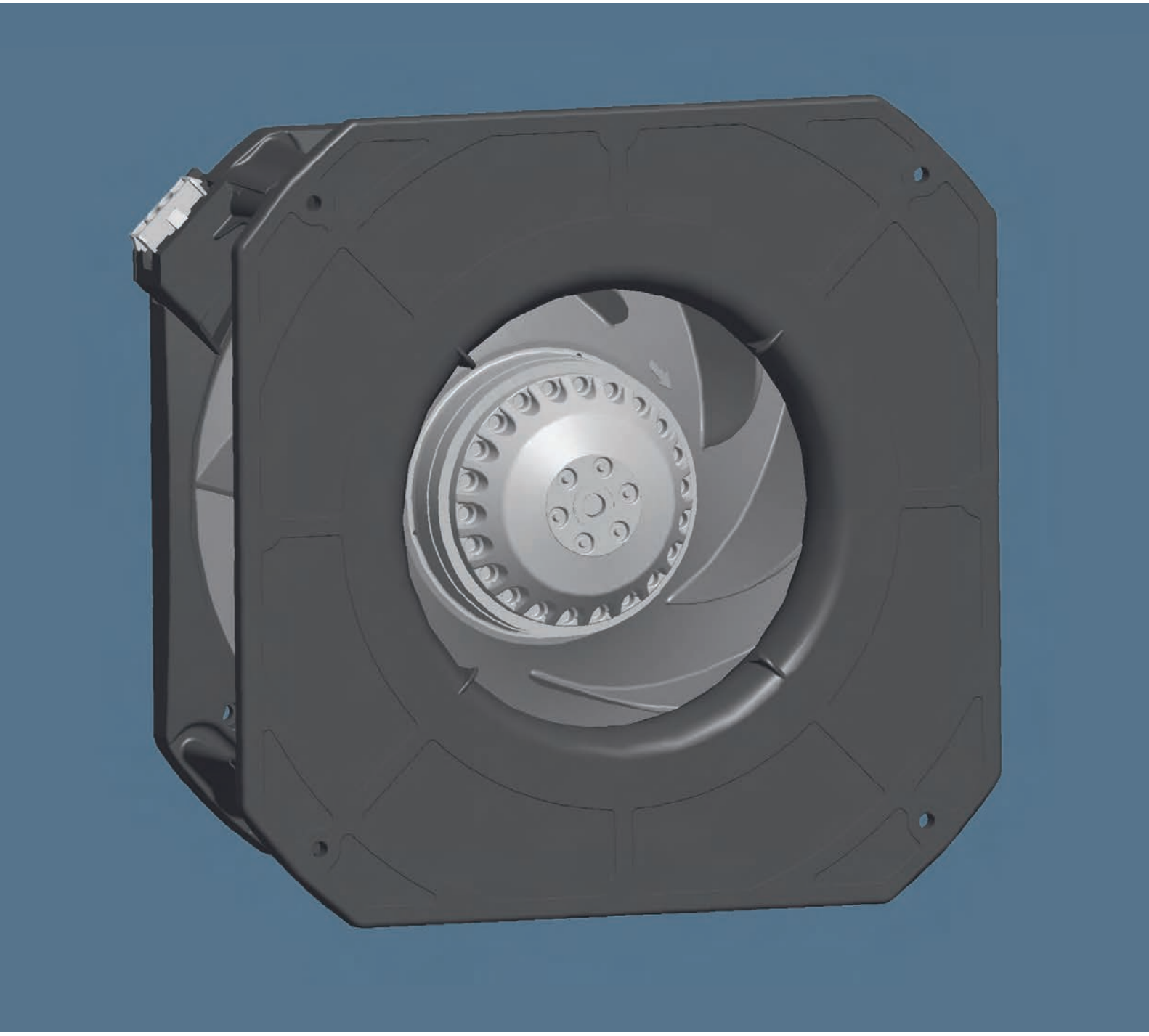
R3G 250-RE09-07



K3G 250-RE09-07



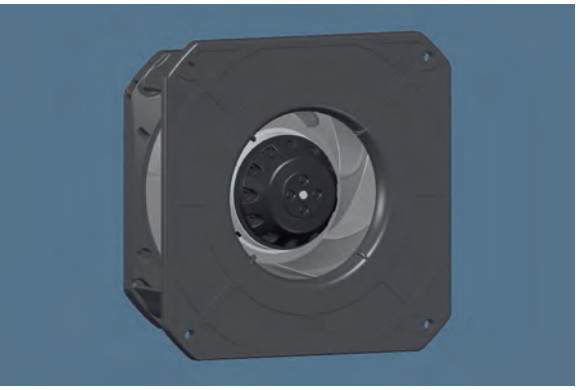
AC centrifugal fans RadiCal



ErP2015 EXCEEDS THE NORM

AC centrifugal fans RadiCal

backward curved, Ø 133



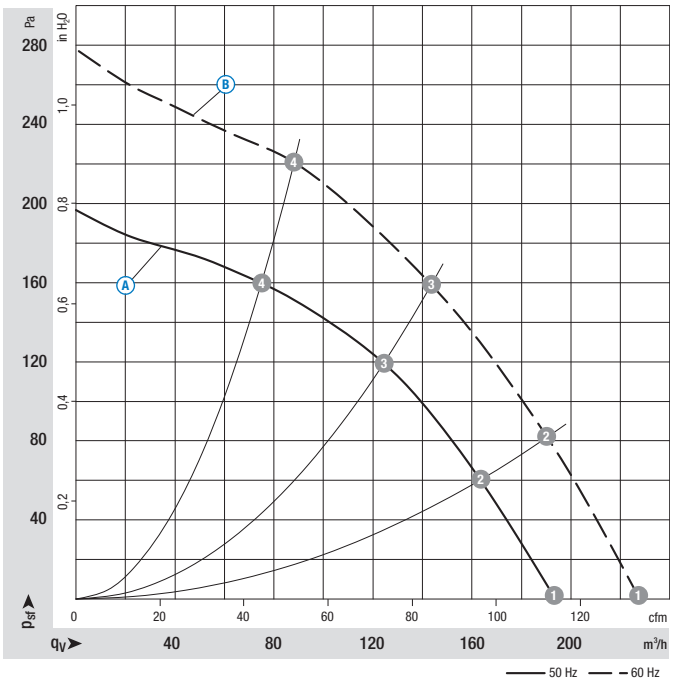
- **Material:** Housing: Plastic PA 6, fibreglass-reinforced
  Impeller: Plastic PA 6, fibreglass-reinforced
  Rotor: Coated in black
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 42, depending on installation and position in acc. to EN 60034-5
- **Insulation class:** "B"
- **Mounting position:** Any
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data

Type	Motor	Curve	Nominal voltage	Frequency	Speed/rpm	Input power	Current draw	Capacitor	Perm. amb. temp.	Electr. connection
			VAC	Hz	rpm	W	A	µF/VDB	°C	p. 64
*2E 133	M2E 042-CA	Ⓐ	1~ 230	50	2750	25	0,11	1,5 / 400	-25..+45	A1)
		Ⓑ	1~ 230	60	3200	25	0,13	1,5 / 400	-25..+60	

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 measurment conditions listed and may vary depending on the installation situation.

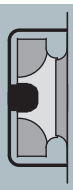
With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 66 ff.

		n rpm	P_e W	I A	L_{WA} dB(A)
Ⓐ	1	2750	25	0,11	58
Ⓐ	2	2730	25	0,11	56
Ⓐ	3	2710	25	0,11	53
Ⓐ	4	2730	24	0,11	57
Ⓑ	1	3200	25	0,13	62
Ⓑ	2	3170	26	0,13	59
Ⓑ	3	3125	26	0,14	57
Ⓑ	4	3185	25	0,13	60

ebmpapst

- **Motor protection:** TOP wired internally
- **Leakage current:** < 0,75 mA
- **Cable exit:** Variable
- **Protection class:** I
- **Product conforming to standards:** EN 60335-1, CE

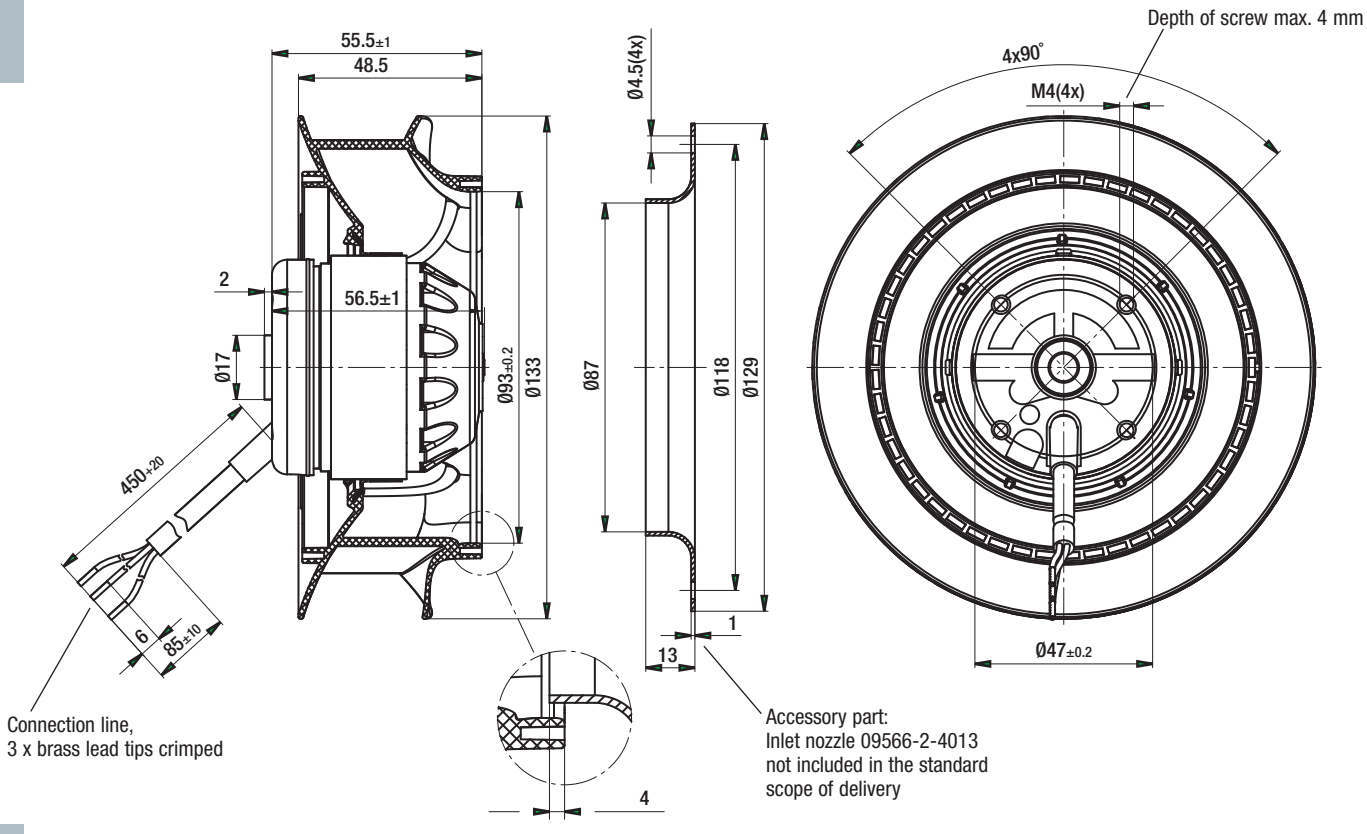


Centrifugal fan	Mass of centrifugal fan kg	Centrifugal module	Mass of centrifugal module with support basket kg
R2E 133-RA03 -01	0,6	**K2E 133-RA03 -01**	0,8

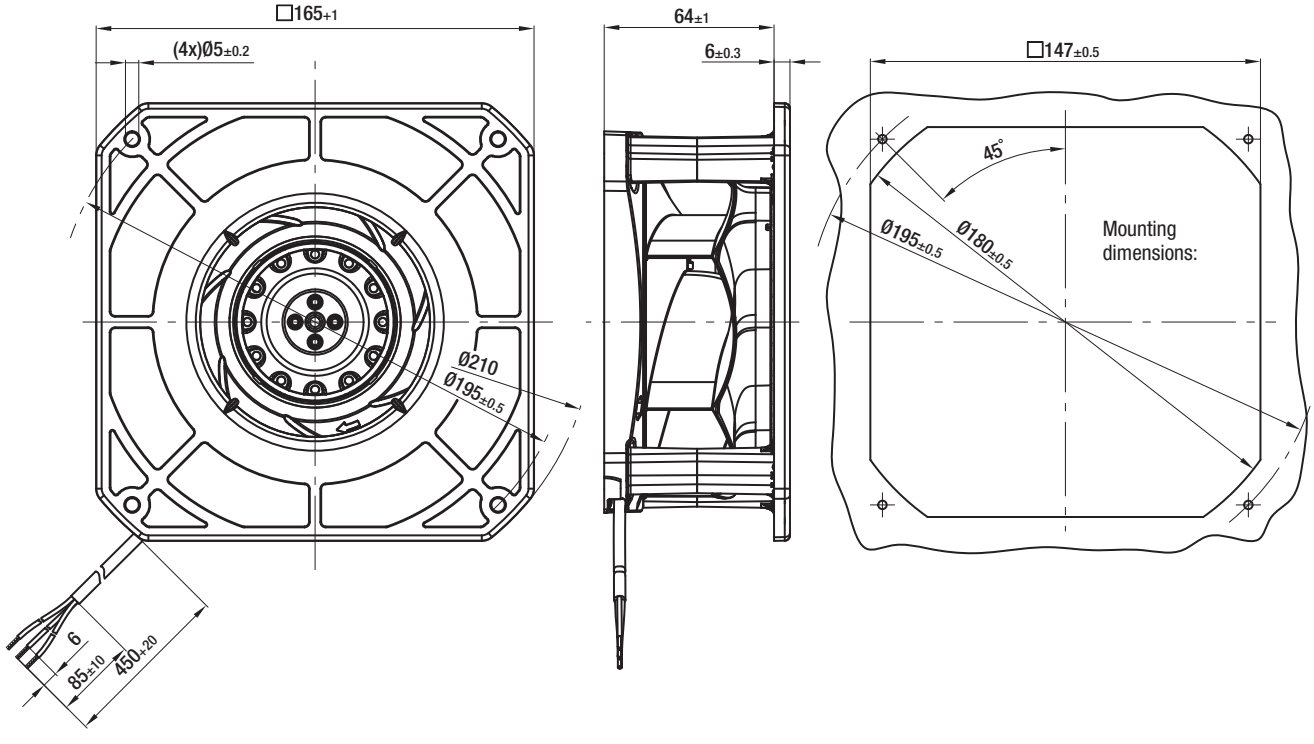
AC centrifugal fans RadiCal

backward curved, Ø 133

R2E 133-RA03-01



K2E 133-RA03-01

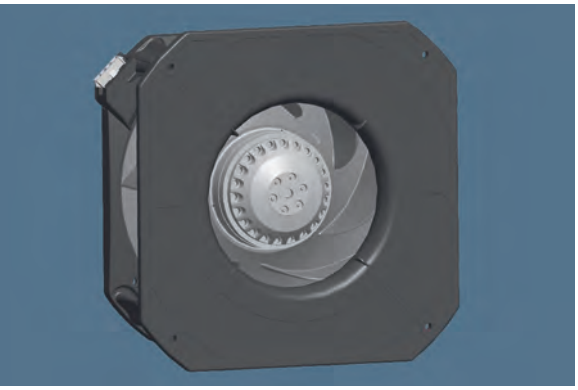


ebmpapst

ErP2015 EXCEEDS THE NORM

AC centrifugal fans RadiCal

backward curved, Ø 190



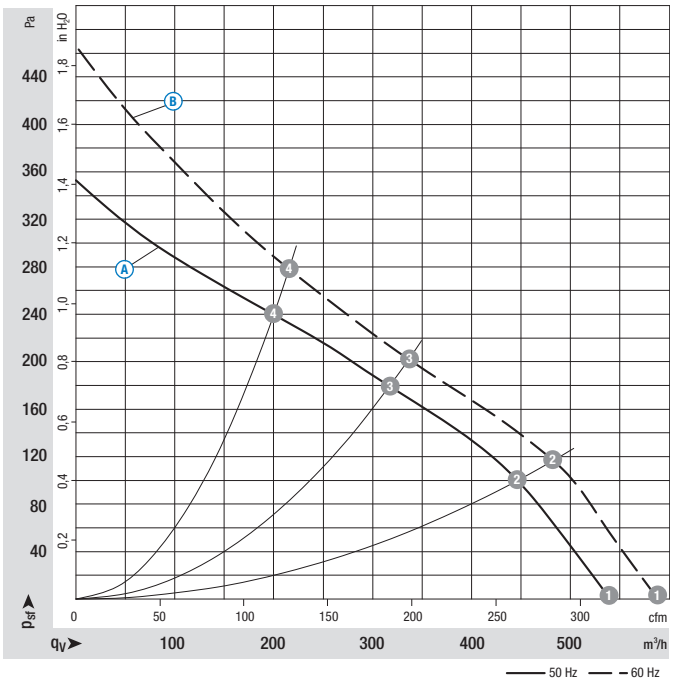
- **Material:** Housing: Plastic PA 6, fibreglass-reinforced
  Impeller: Plastic PA 6, fibreglass-reinforced
  Rotor: Coated in black
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 44, depending on installation and position in acc. to EN 60034-5
- **Insulation class:** "B"
- **Mounting position:** Any
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data

Type	Motor	Curve	Nominal voltage	Frequency	Speed/rpm	Input power	Current draw	Capacitor	Perm. amb. temp.	Electr. connection
			VAC	Hz	rpm	W	A	µF/VDB	°C	p. 64
*2E 190	M2E 068-BF	A	1~ 230	50	2480	48	0,22	1,5 / 400	-25..+65	A1)
		B	1~ 230	60	2720	60	0,27	1,5 / 400	-25..+75	

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 measurment conditions listed and may vary depending on the installation situation.

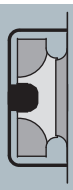
With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 66 ff.

		n rpm	P_e W	I A	L_{WA} dB(A)
A	1	2480	48	0,22	66
A	2	2440	49	0,22	63
A	3	2370	52	0,23	60
A	4	2435	50	0,22	62
B	1	2720	60	0,27	68
B	2	2645	62	0,27	66
B	3	2505	65	0,28	62
B	4	2615	62	0,27	65

ebmpapst

- **Motor protection:** TOP wired internally
- **Leakage current:** < 0,75 mA
- **Cable exit:** Variable (R2E...)
- **Connection leads:** Plug system (K2E...)
- **Protection class:** I
- **Product conforming to standard:** EN 60335-1, CE
- **Approvals:** VDE, CCC, GOST

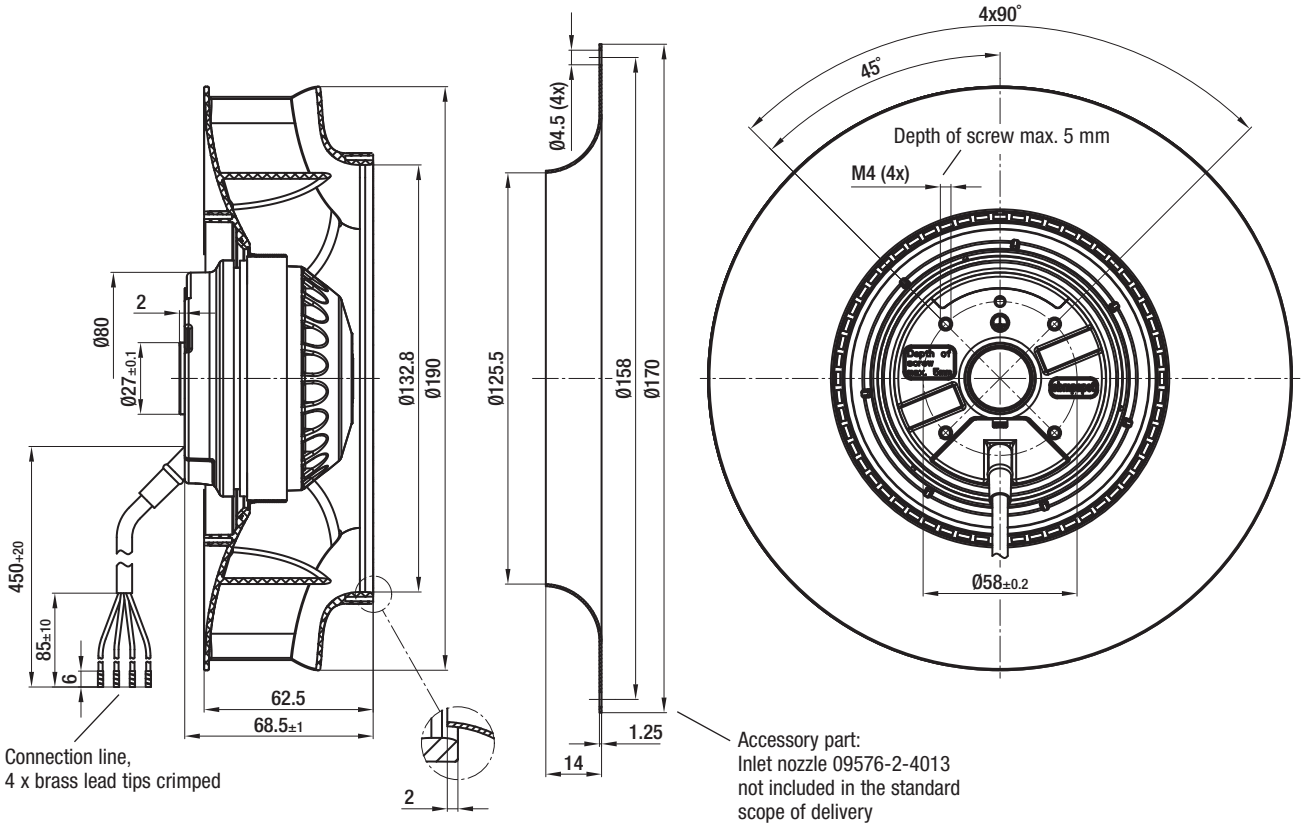


Centrifugal fan	Mass of centrifugal fan kg	Centrifugal module	Mass of centrifugal module with support basket kg
R2E 190-RA26 -05	1,3	**K2E 190-RA26 -01**	1,7

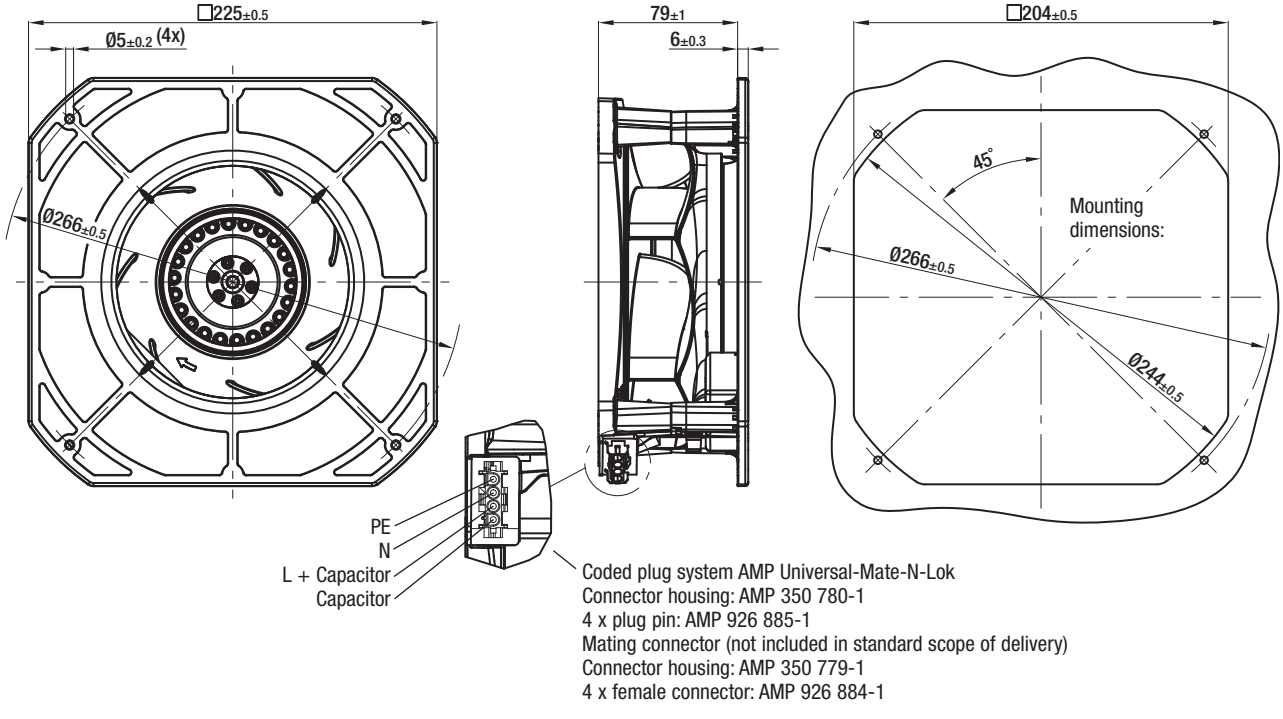
AC centrifugal fans RadiCal

backward curved, Ø 190

R2E 190-RA26-05



K2E 190-RA26-01

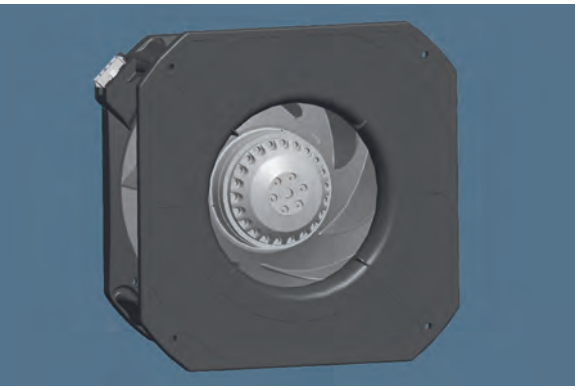


ebmpapst

ErP2015 EXCEEDS THE NORM

AC centrifugal fans RadiCal

backward curved, Ø 220



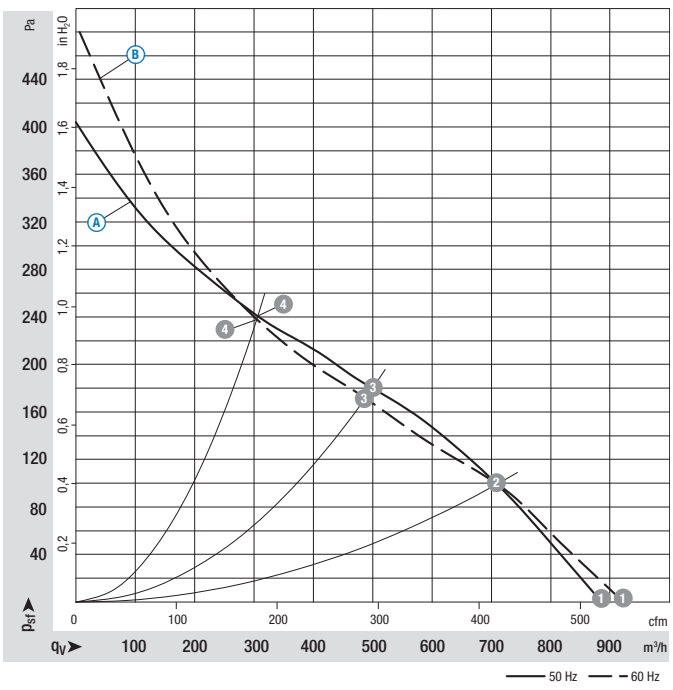
- **Material:** Housing: Plastic PA 6, fibreglass-reinforced
  Impeller: Plastic PA 6, fibreglass-reinforced
  Rotor: Coated in black
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 44, depending on installation and position in acc. to EN 60034-5
- **Insulation class:** "F"
- **Mounting position:** Any
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data

Type	Motor	Curve	Nominal voltage	Frequency	Speed/rpm	Input power	Current draw	Capacitor	Perm. amb. temp.	Electr. connection
			VAC	Hz	rpm	W	A	µF/VDB	°C	p. 64
*2E 220	M2E 068-BF	Ⓐ	1~ 230	50	2350	80	0,36	2,0 / 450	-25..+50	A1)
		Ⓑ	1~ 230	60	2450	102	0,46	2,0 / 450	-25..+60	
*2E 220	M2E 068-CF	Ⓒ	1~ 230	50	2600	90	0,40	2,5 / 400	-25..+60	A1)
		Ⓓ	1~ 230	60	2900	120	0,53	2,5 / 400	-25..+70	

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 measurment 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!

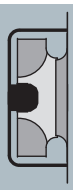
For detailed information see page 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
Ⓐ	1	2350	80	0,36	68
Ⓐ	2	2240	86	0,38	62
Ⓐ	3	2130	88	0,39	60
Ⓐ	4	2185	86	0,38	63
Ⓑ	1	2450	102	0,46	69
Ⓑ	2	2220	106	0,46	62
Ⓑ	3	2075	107	0,47	60
Ⓑ	4	2165	106	0,46	63

ebmpapst

- **Motor protection:** TOP wired internally
- **Leakage current:** < 0,75 mA
- **Cable exit:** Variable (R2E...)
- **Connection leads:** Plug system (K2E...)
- **Protection class:** I
- **Product conforming to standard:** EN 60335-1, CE
- **Approvals:** VDE, CCC, GOST

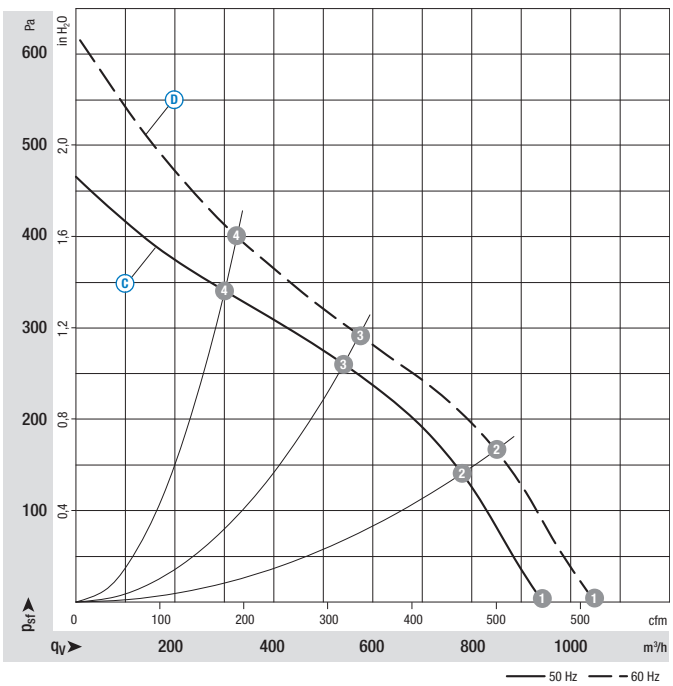
Mass of centrifugal fan



Mass of centrifugal module with support basket

Centrifugal fan	kg	Centrifugal module	kg
R2E 220-RA38 -01	1,30	**K2E 220-RA38 -01**	2,10
R2E 220-RB06 -01	1,80	**K2E 220-RB06 -01**	2,60

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 measurment 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!

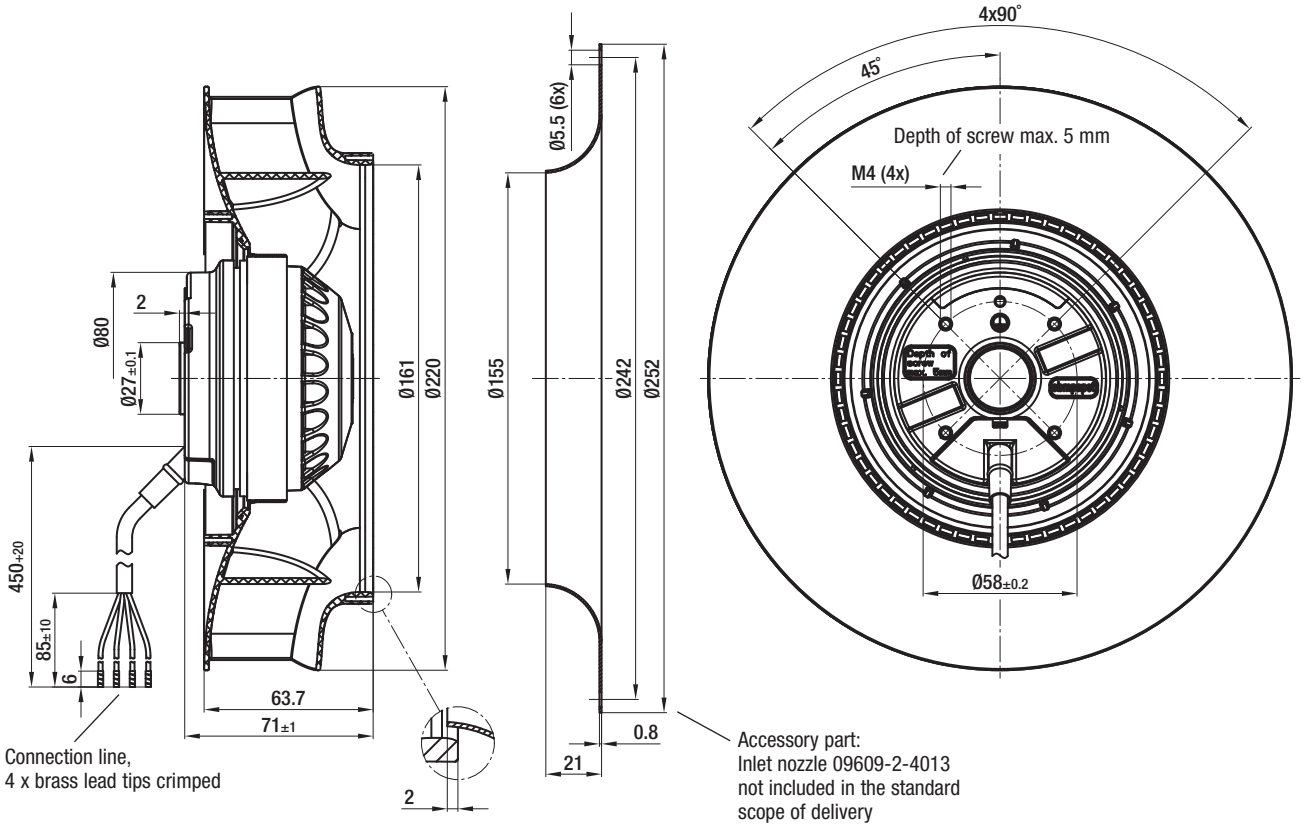
For detailed information see page 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
C	1	2600	90	0,40	70
C	2	2575	95	0,43	66
C	3	2520	102	0,45	64
C	4	2580	95	0,42	67
D	1	2900	120	0,53	73
D	2	2790	128	0,56	68
D	3	2665	135	0,59	66
D	4	2795	126	0,55	69

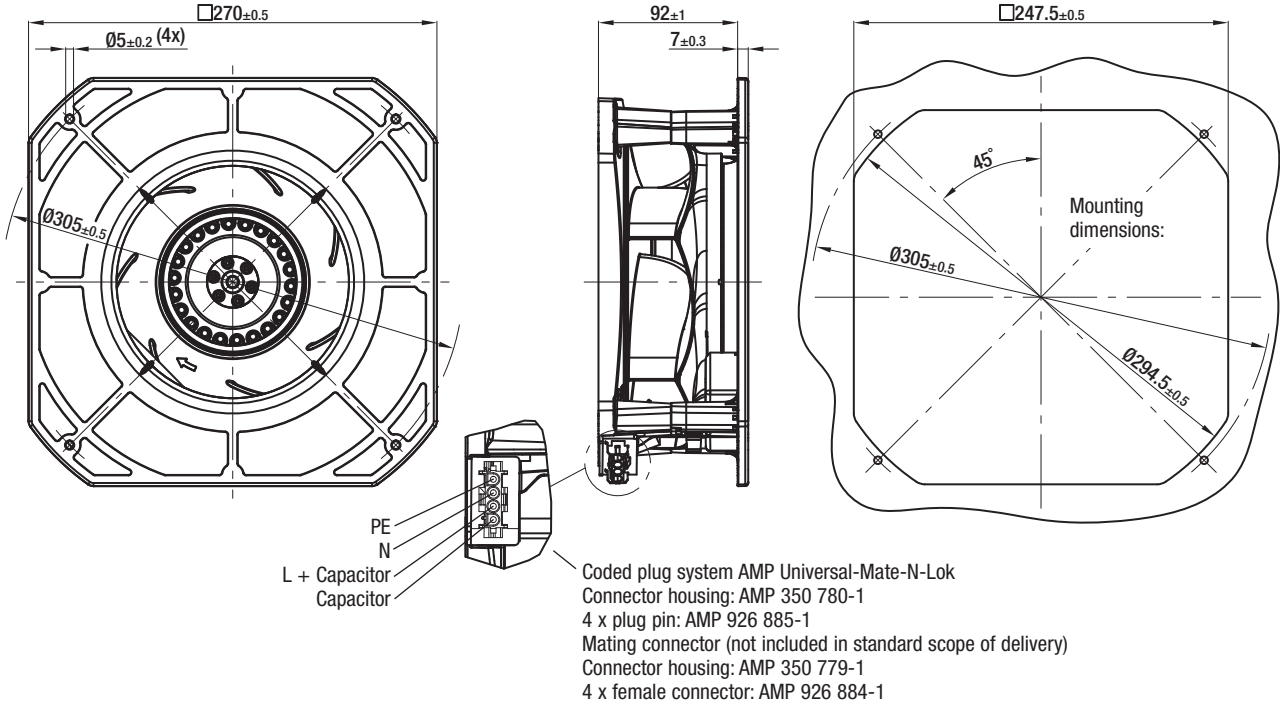
AC centrifugal fans RadiCal

backward curved, Ø 220

R2E 220-RA38-01 / R2E 220-RB06-01



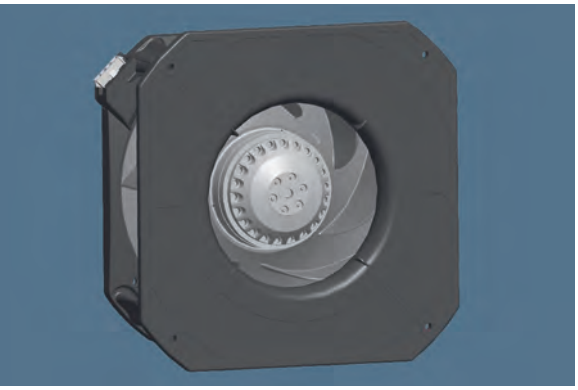
K2E 220-RA38-01 / K2E 220-RB06-01



ErP2015 EXCEEDS THE NORM

AC centrifugal fans RadiCal

backward curved, Ø 225



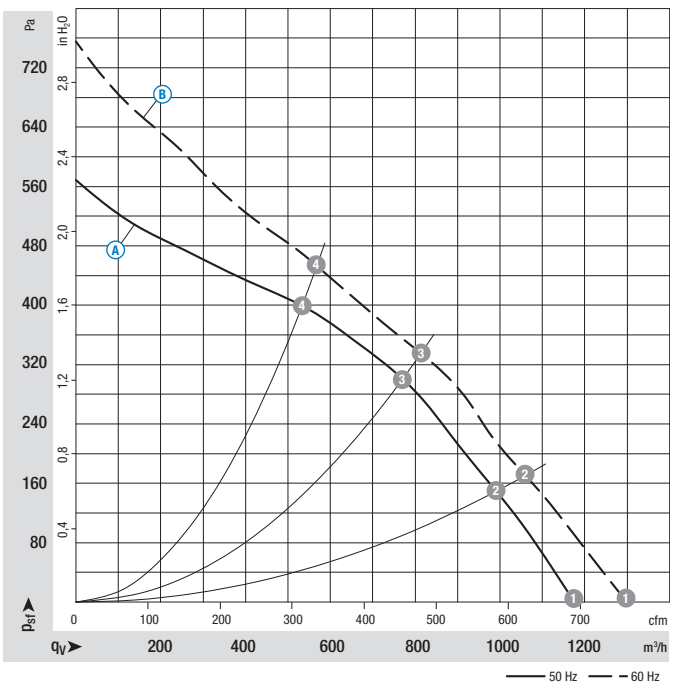
- **Material:** Housing: Plastic PA 6, fibreglass-reinforced
  Impeller: Plastic PA 6, fibreglass-reinforced
  Rotor: Coated in black
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 44, depending on installation and position in acc. to EN 60034-5
- **Insulation class:** "F"
- **Mounting position:** Any
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data

Type	Motor	Curve	Nominal voltage	Frequency	Speed/rpm	Input power	Current draw	Capacitor	Perm. amb. temp.	Electr. connection
			VAC	Hz	rpm	W	A	µF/VDB	°C	p. 64
*2E 225	M2E 068-DF	A	1~ 230	50	2660	130	0,57	3,5 / 450	-25..+60	A1)
		B	1~ 230	60	2900	190	0,83	3,5 / 450	-25..+60	

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 measurment 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!

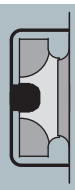
For detailed information see page 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
A	1	2660	130	0,57	73
A	2	2575	147	0,64	72
A	3	2560	149	0,65	66
A	4	2590	144	0,63	69
B	1	2900	190	0,83	76
B	2	2735	205	0,89	73
B	3	2700	207	0,90	68
B	4	2750	202	0,88	71

ebmpapst

- **Motor protection:** TOP wired internally
- **Leakage current:** < 0,75 mA
- **Cable exit:** Variable (R2E...)
- **Connection leads:** Plug system (K2E...)
- **Protection class:** I
- **Product conforming to standard:** EN 60335-1, CE
- **Approvals:** VDE, CCC, GOST

Mass of centrifugal fan



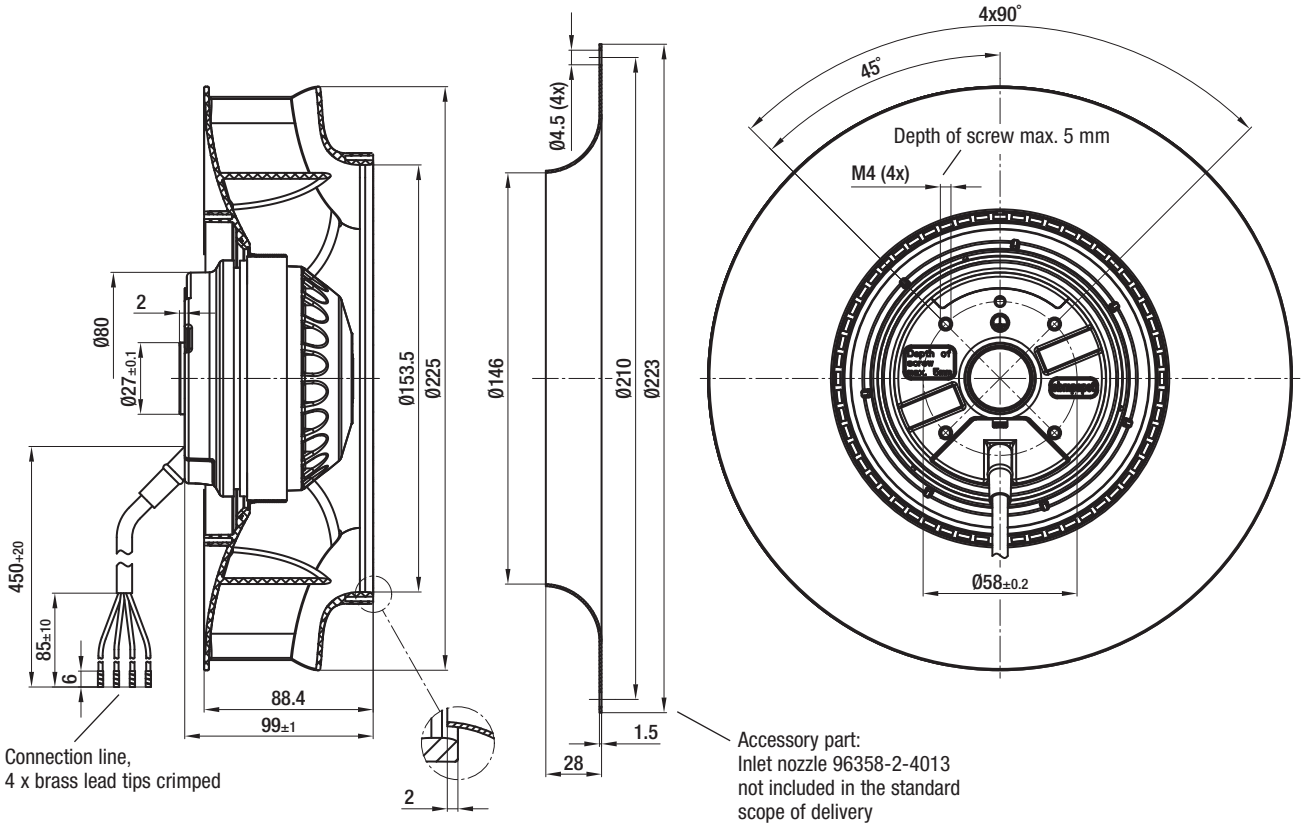
Mass of centrifugal module with support basket

Centrifugal fan	kg	Centrifugal module	kg
R2E 225-RA92 -09	2,30	**K2E 225-RA92 -01**	3,50

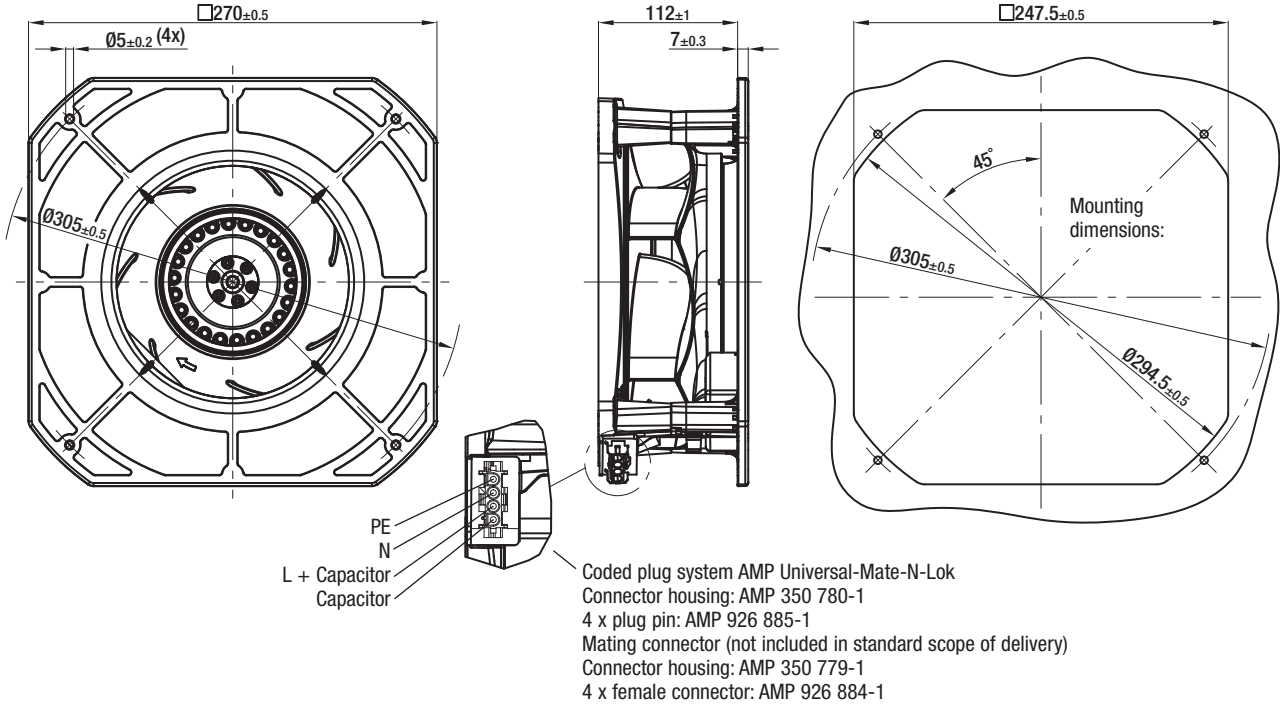
AC centrifugal fans RadiCal

backward curved, Ø 225

R2E 225-RA92-09



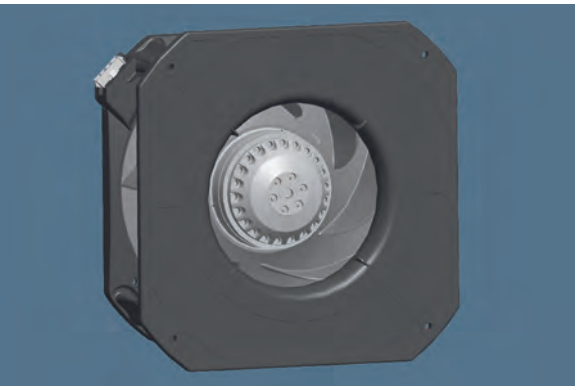
K2E 225-RA92-01



ErP2013 EXCEEDS THE NORM

AC centrifugal fans RadiCal

backward curved, Ø 250



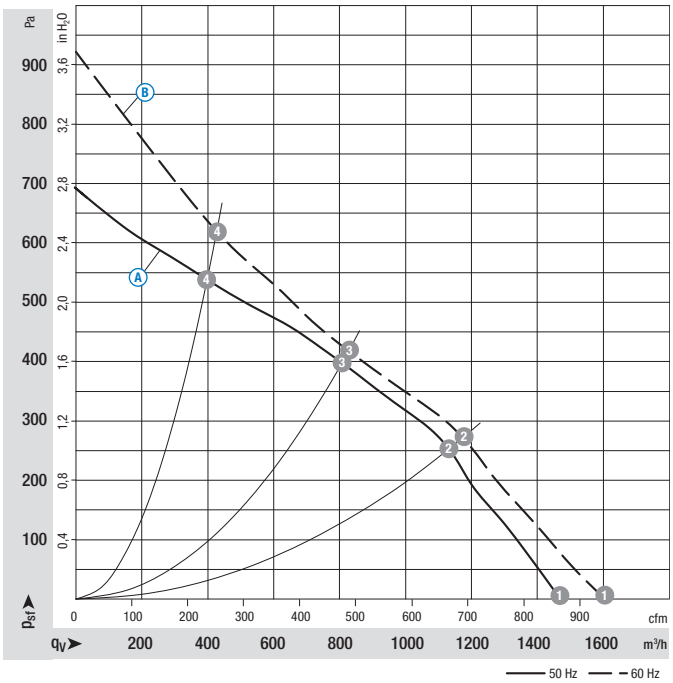
- **Material:** Housing: Plastic PA 6, fibreglass-reinforced
  Impeller: Plastic PA 6, fibreglass-reinforced
  Rotor: Coated in black
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 44, depending on installation and position in acc. to EN 60034-5
- **Insulation class:** "F"
- **Mounting position:** Any
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data

Type	Motor	Curve	Nominal voltage	Frequency	Speed/rpm	Input power	Current draw	Capacitor	Perm. amb. temp.	Electr. connection
			VAC	Hz	rpm	W	A	µF/VDB	°C	p. 64
*2E 250	M2E 068-EC	A	1~ 230	50	2650	185	0,82	6,0 / 400	-25..+50	A1)
		B	1~ 230	60	2850	260	1,15	6,0 / 400	-25..+35	

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 measurment conditions listed and may vary depending on the installation situation.

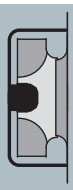
With any deviation to the standard setup, the specific values have to be checked and reviewed once installed or fitted!

For detailed information see page 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
A	1	2650	185	0,82	75
A	2	2555	208	0,90	69
A	3	2530	212	0,92	67
A	4	2645	182	0,79	75
B	1	2850	260	1,15	78
B	2	2645	284	1,23	70
B	3	2590	288	1,25	69
B	4	2820	263	1,15	77

ebmpapst

- **Motor protection:** TOP wired internally
- **Leakage current:** < 0,75 mA
- **Cable exit:** Variable (R2E...)
- **Connection leads:** Plug system (K2E...)
- **Protection class:** I
- **Product conforming to standard:** EN 60335-1, CE
- **Approvals:** CCC, GOST

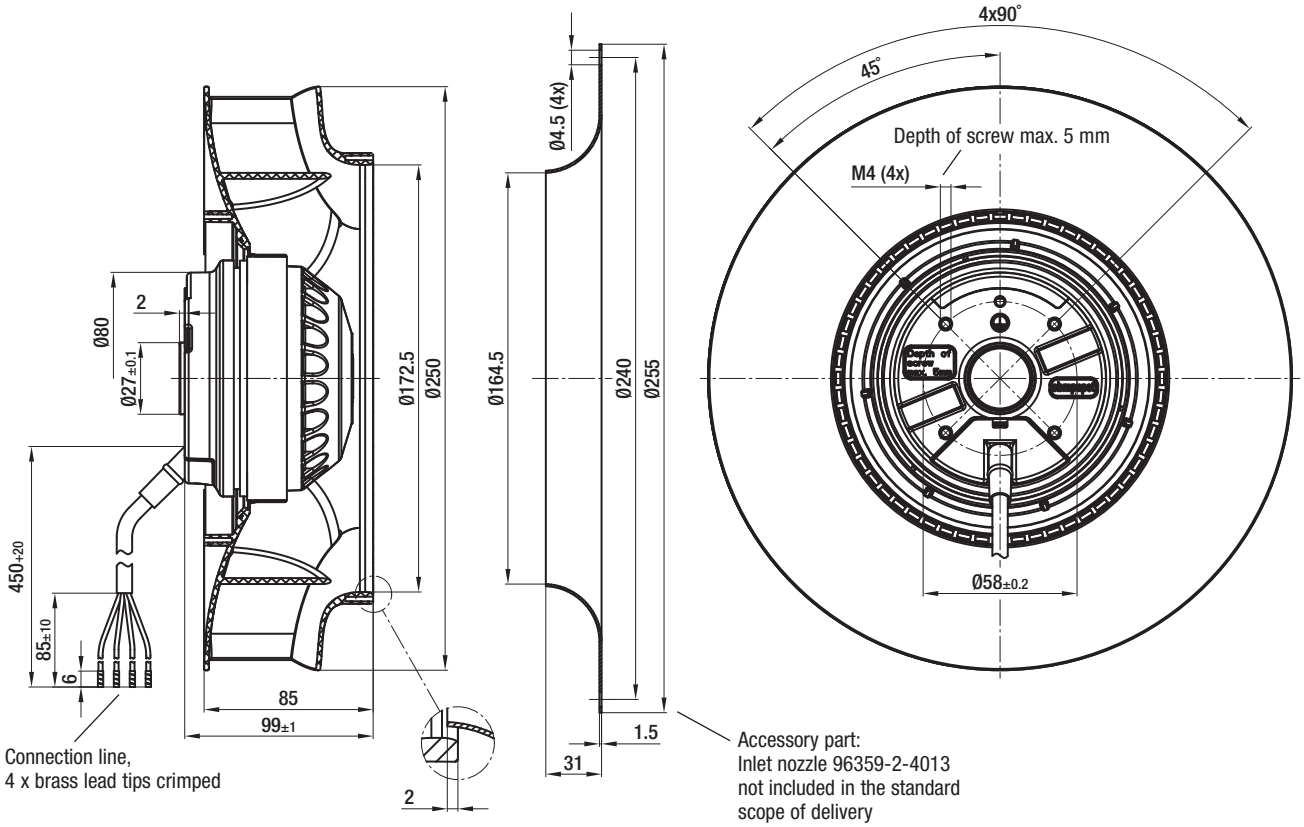


Centrifugal fan	Mass of centrifugal fan kg	Centrifugal module	Mass of centrifugal module with support basket kg
R2E 250-RA50 -01	2,90	**K2E 250-RA50 -01**	3,70

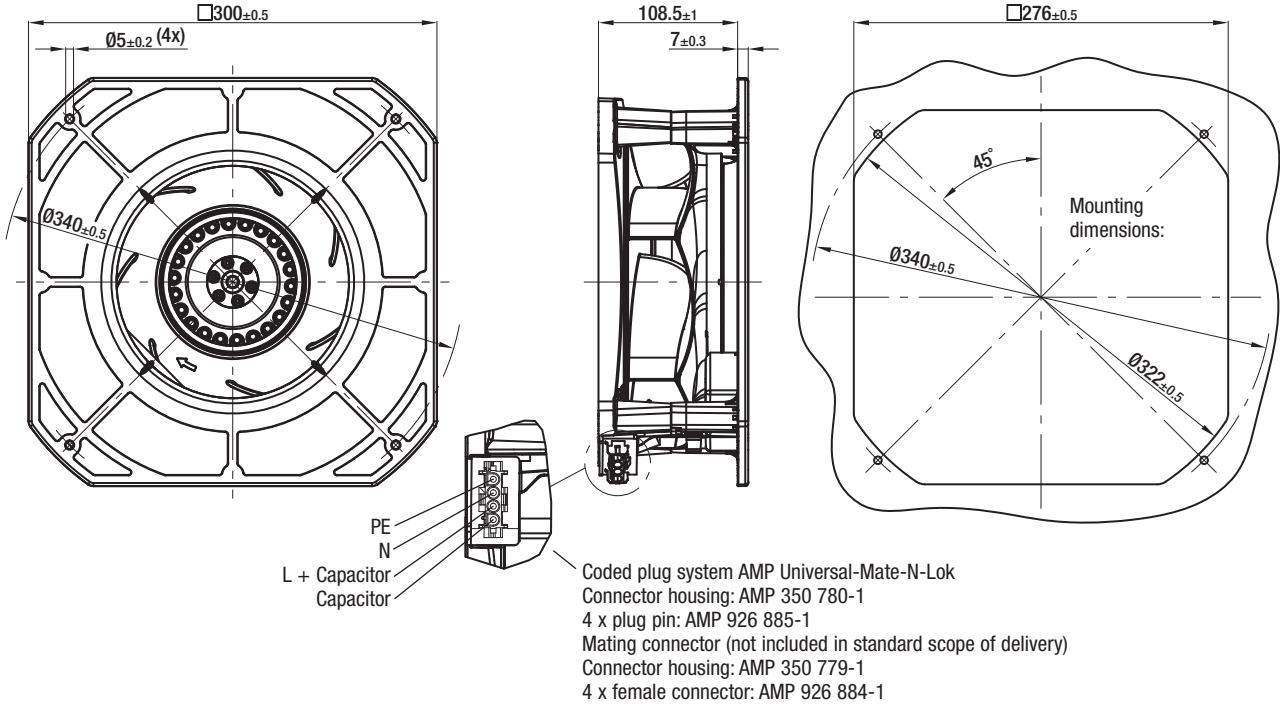
AC centrifugal fans RadiCal

backward curved, Ø 250

R2E 250-RA50-01



K2E 250-RA50-01



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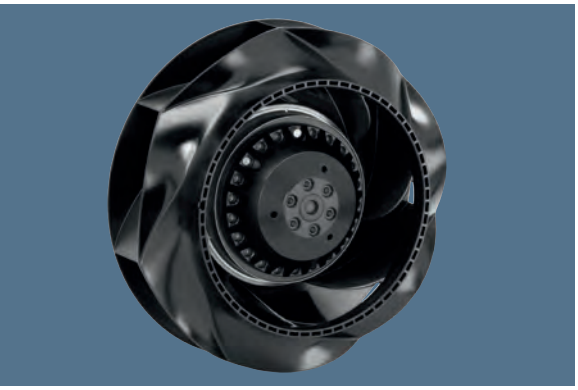
ErP2015 EXCEEDS THE NORM

AC centrifugal fans RadiCal

backward curved, Ø 250



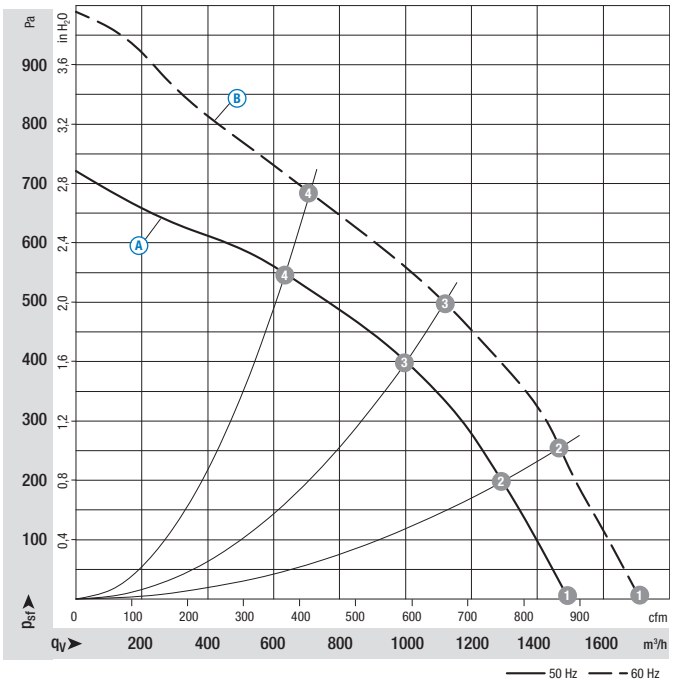
- **Material:** Impeller: Plastic PA 6, fibreglass-reinforced
  Rotor: Coated in black
- **Number of blades:** 7
- **Direction of rotation:** Clockwise, seen on rotor
- **Type of protection:** IP 44, depending on installation and position in acc. to EN 60034-5
- **Insulation class:** "F"
- **Mounting position:** Any
- **Condensate discharges:** Rotor-side
- **Mode of operation:** Continuous operation (S1)
- **Bearings:** Maintenance-free ball bearings

Nominal data

Type	Motor	Curve	Nominal voltage	Frequency	Speed/rpm	Input power	Current draw	Capacitor	Perm. amb. temp.	Electr. connection
			VAC	Hz	rpm	W	A	µF/VDB	°C	p. 64
*2E 250	M2E 074-EI	Ⓐ	1~ 230	50	2800	215	0,95	5,0 / 450	-25..+70	A1)
		Ⓑ	1~ 230	60	3200	345	1,51	5,0 / 450	-25..+55	

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 measurment 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 66 ff.

		n rpm	P_e W	I A	L_WA dB(A)
Ⓐ	1	2800	215	0,95	78
Ⓐ	2	2790	236	1,03	74
Ⓐ	3	2775	246	1,07	71
Ⓐ	4	2800	228	0,99	74
Ⓑ	1	3200	345	1,51	81
Ⓑ	2	3150	368	1,61	77
Ⓑ	3	3090	386	1,68	73
Ⓑ	4	3140	369	1,61	79

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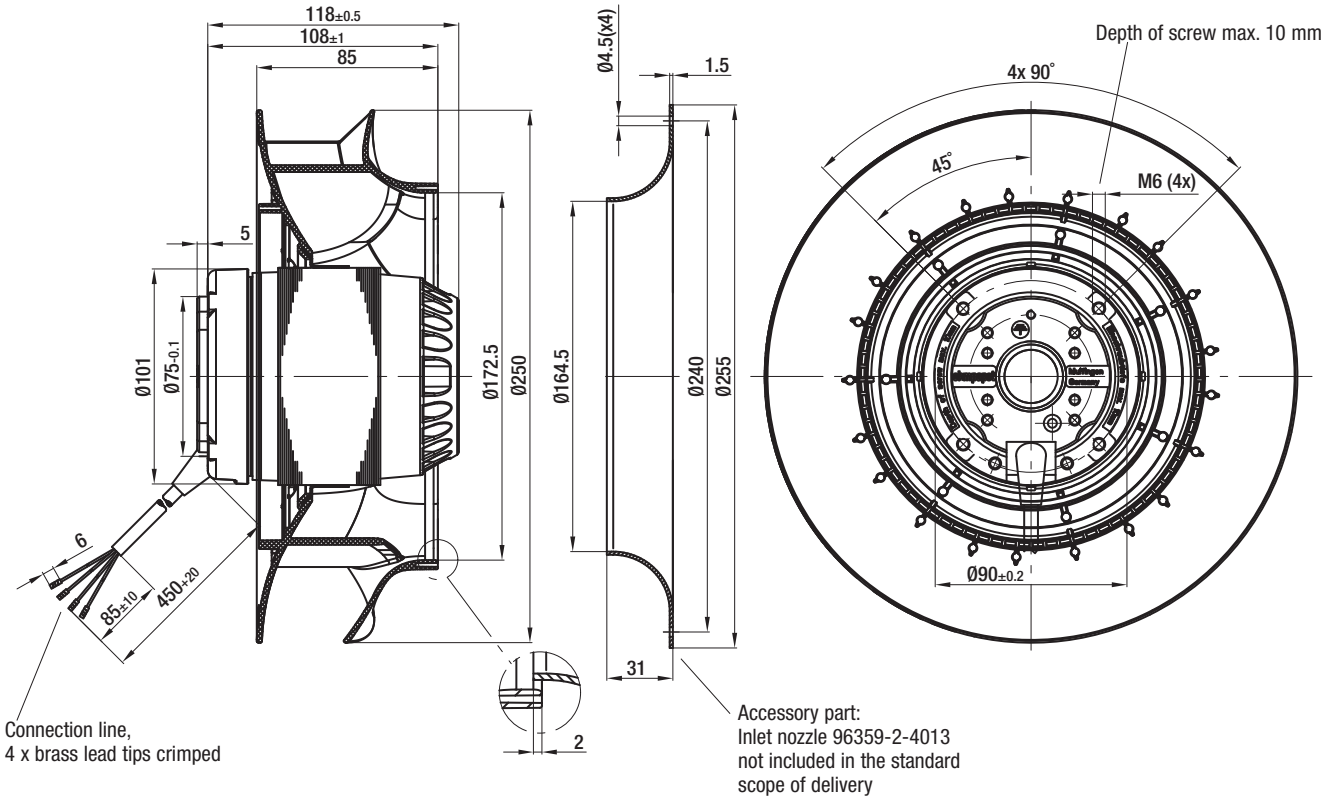
- **Motor protection:** TOP wired internally
- **Leakage current:** < 0,75 mA
- **Cable exit:** Variable
- **Protection class:** I
- **Product conforming to standard:** EN 60335-1, CE

Centrifugal fan	Mass of centrifugal fan kg
R2E 250-RB06 -01	4,10

AC centrifugal fans RadiCal

backward curved, Ø 250

R2E 250-RB06-01



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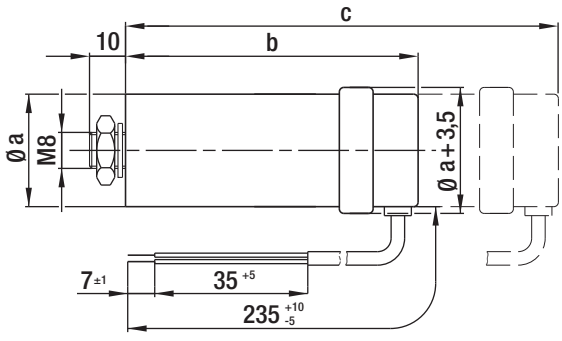
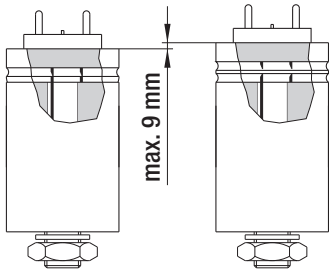


- **Material:** Plastic cap, aluminium cup
- **Designation:** FPU or P2 according to IEC 252 (non-flammable, non-explosive, circuit-breaking)
- **Approval:** VDE according to DIN EN 60252 (VDE 0560/8)
- **Calculated life time:**
  420 V; -25 to +85°C; 30,000 hrs; class A
  470 V; -25 to +85°C; 10,000 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.)
02155-4-7320	1,5 µF	25,0	77,0	92,0
02156-4-7320	2,0 µF	25,0	77,0	92,0
02159-4-7320	2,5 µF	30,0	71,0	92,0
02179-4-7320	3,5 µF	30,0	75,0	82,0
02162-4-7320	5,0 µF	25-30	104,0	113,0
02163-4-7320	6,0 µF	30,0	101,0	110,0

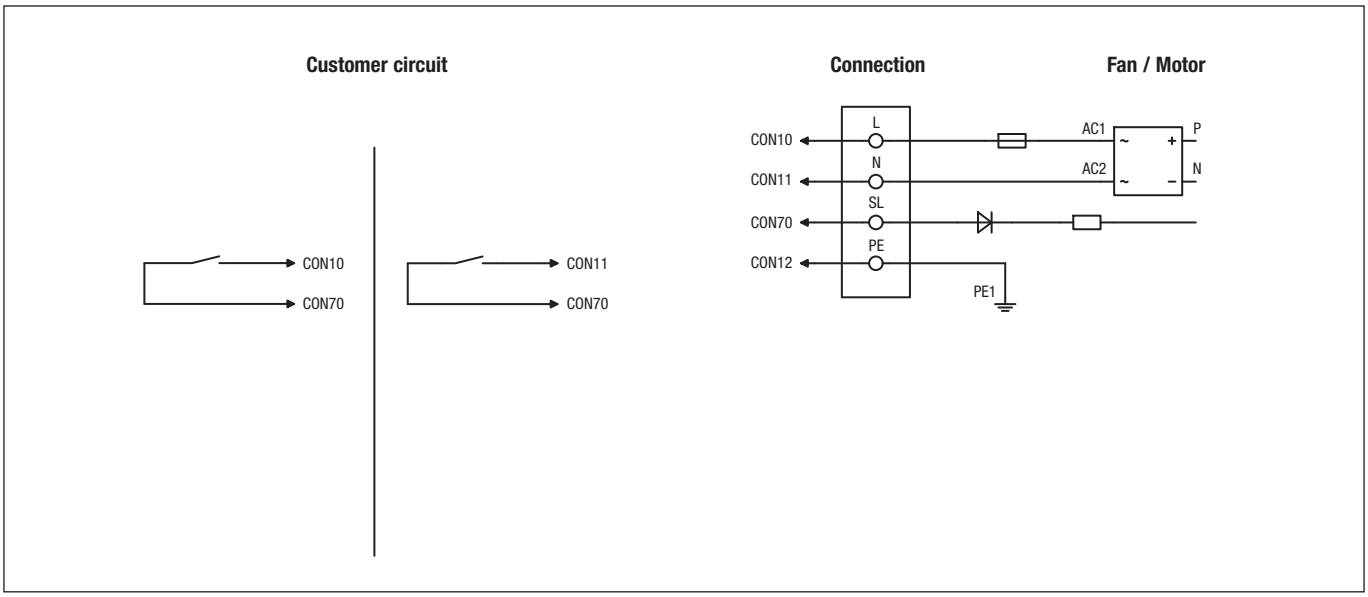
subject to alterations



- **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.

Electrical connections EC/AC

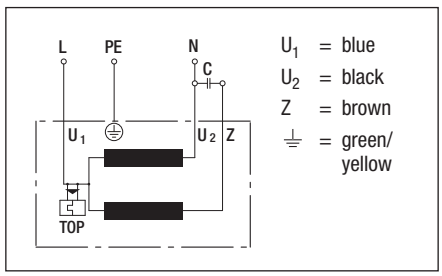
H3) EC motors M3G 045 / M3G 055 (2 Speed stages)



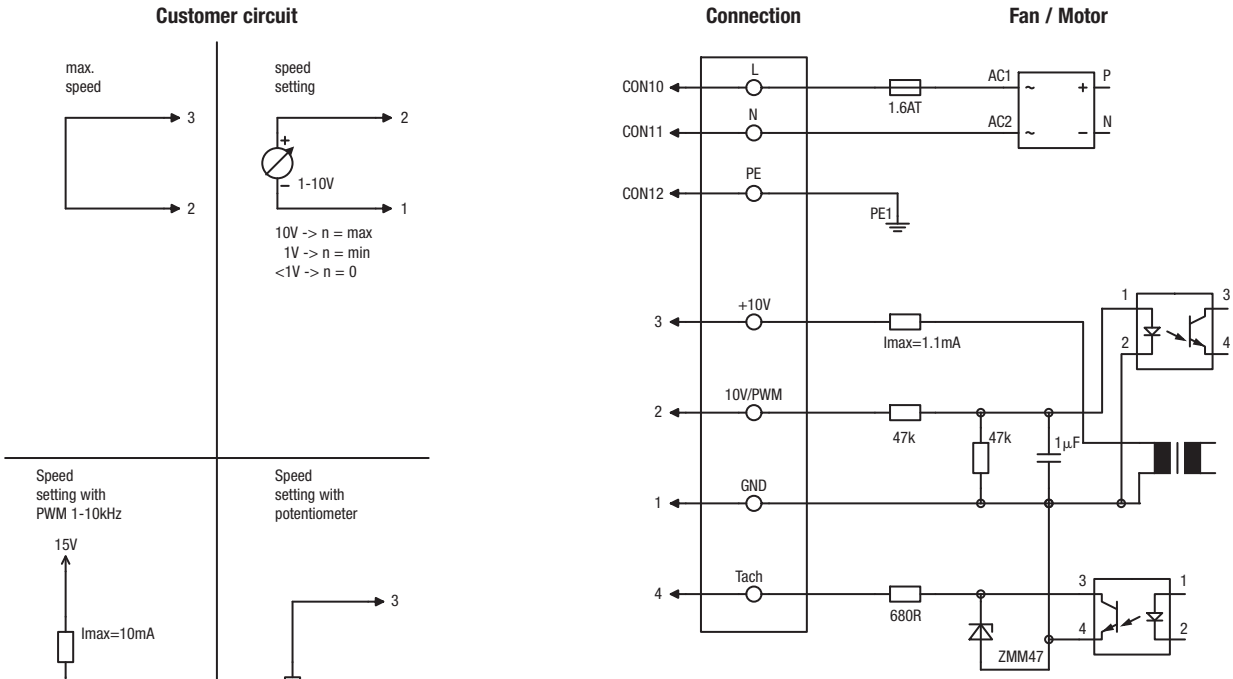
Line	Connection	Colour	Assignment / function
CON10	L	black	Power supply 230 VAC, 50 - 60 Hz
CON11	N	blue	Neutral conductor
CON12	PE	green/yellow	Protective earth
CON70	SL	brown	Speed selection: switch open = speed 1; switch closed = speed 2

A1) Single-phase capacitor motor

with TOP wired internally



H4) EC motors M3G 045 / M3G 055 (Speed-controlled)



Line	Connection	Colour	Assignment / function
CON10	L	black	Power supply 230 VAC, 50 - 60 Hz, see type plate for voltage range
CON11	N	blue	Neutral conductor
CON12	PE	green/yellow	Protective earth
1	GND	blue	GND - Connection for control interface
2	0-10V PWM	yellow	Control input 0 - 10 V or PWM, electrically isolated
3	10V/max.1.1mA	red	Voltage output 10V / 1.1mA, electrically isolated, not short-circuit-proof
4	Tach	white	Tach output: Open Collector, 1 pulse per revolution, electrically isolated

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.

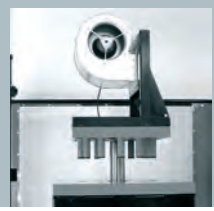
Motor protection / thermal protection

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.

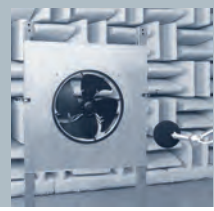
Approvals

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/m^3.

Room for precision noise measuring



Measurement conditions for air and noise measurement

ebm-papst products are measured under the following conditions:

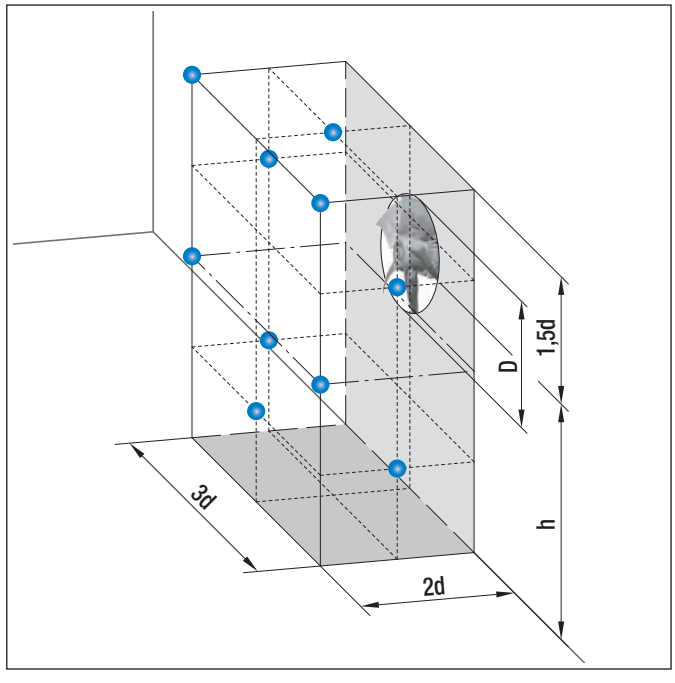
- Axial and diagonal fans in direction of rotation “V” in full nozzle and without guard grille
- Backward curved centrifugal fans, free-running and with inlet nozzle
- Forward curved single and dual inlet centrifugal fans with housing

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

$d \geq D$

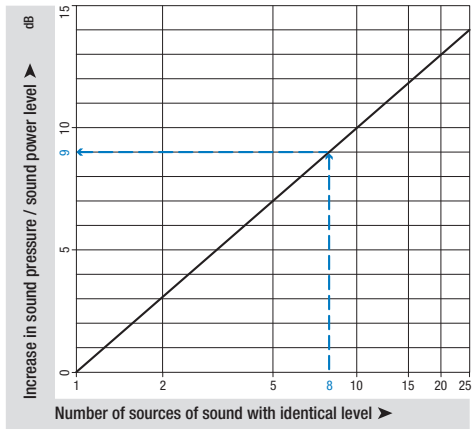
$h = 1{,}5d \ldots 4{,}5d$

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.

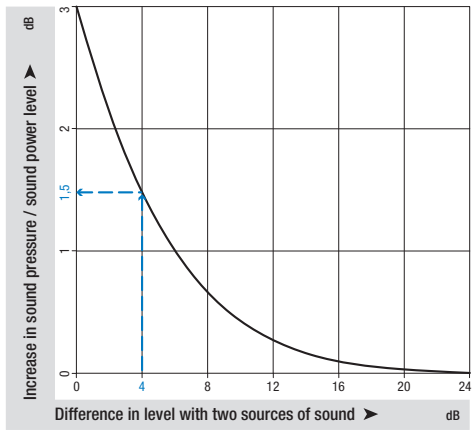
Example: 8 A3G800 axial fans are on a condenser. According to the data sheet, the sound pressure level of a fan is approximately 75 dB(A). The level increase measured from the diagram is 9 dB. Thus the overall sound level of the installation can be expected to be 84 dB(A).



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.

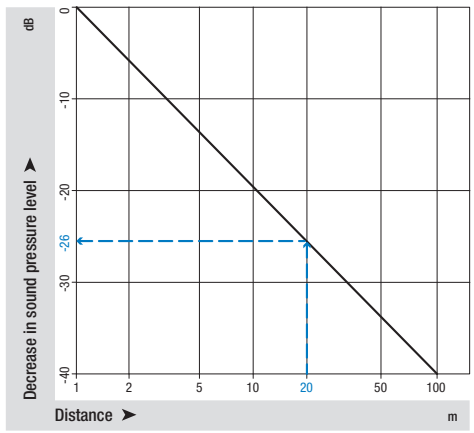
Example: There is an axial fan A3G800 with a sound pressure level of 75 dB(A) at the operating point and an axial fan A3G710 with 71 dB(A) in a ventilation unit. The level difference is 4 dB. The level increase can now be read in the diagram as approx. 1.5 dB. This means that the overall sound level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



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