

# EC centrifugal module - RadiPac

backward-curved, single-intake

with support bracket

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## Nominal data

Type	K3G500-PW09-01	
Motor	M3G112-IA	
Phase		3~
Nominal voltage	VAC	400
Nominal voltage range	VAC	380 .. 480
Frequency	Hz	50/60
Method of obtaining data		ml
Speed (rpm)	min <sup>-1</sup>	1670
Power consumption	W	2350
Current draw	A	3.6
Min. ambient temperature	°C	-40
Max. ambient temperature	°C	40

ml = Max. load · me = Max. efficiency · fa = Free air · cs = Customer specification · ce = Customer equipment  
Subject to change

## Data according to Commission Regulation (EU) 327/2011 (prEN 17166)

		Actual	Req. 2015			
01 Overall efficiency $\eta_{es}$	%	66.5	55.4	09 Power consumption $P_{ed}$	kW	2.34
02 Measurement category		A		09 Air flow $q_v$	m <sup>3</sup> /h	7525
03 Efficiency category		Static		09 Pressure increase $p_{fs}$	Pa	704
04 Efficiency grade N		73.1	62	10 Speed (rpm) $n$	min <sup>-1</sup>	1675
05 Variable speed drive		Yes		11 Specific ratio*		1.01

Data obtained at optimum efficiency level.

\* Specific ratio =  $1 + p_{fs} / 100\,000\text{ Pa}$ 

LU-194543

The efficiency values displayed for achieving conformity with the Ecodesign Regulation EU 327/2011 has been reached with defined air duct components (e.g. inlet rings). The dimensions must be requested from ebmpapst. If other air conduction geometries are used on the installation side, the ebm-papst evaluation loses its validity/the conformity must be confirmed again. The product does not fall within the scope of Regulation (EU) 2019/1781 due to the exception specified in Article 2 (2a) (motors completely integrated into a product).



## Technical description

<b>Weight</b>	32.6 kg
<b>Size</b>	500 mm
<b>Motor size</b>	112
<b>Rotor surface</b>	Painted black
<b>Electronics housing material</b>	Die-cast aluminum
<b>Impeller material</b>	Sheet aluminum
<b>Support plate material</b>	Sheet steel, galvanized
<b>Support bracket material</b>	Steel, painted black
<b>Inlet nozzle material</b>	Sheet steel, galvanized
<b>Number of blades</b>	5
<b>Direction of rotation</b>	Clockwise, viewed toward rotor
<b>Degree of protection</b>	IP55
<b>Insulation class</b>	"F"
<b>Moisture (F) / Environmental (H) protection class</b>	H1
<b>Ambient temperature note</b>	Occasional start-up at temperatures between -40°C and -25°C is permitted. For continuous operation at ambient temperatures below -25°C (such as refrigeration applications), use must be made of a fan design with special low-temperature bearings.
<b>Max. permitted ambient temp. for motor (transport/storage)</b>	+80 °C
<b>Min. permitted ambient temp. for motor (transport/storage)</b>	-40 °C
<b>Installation position</b>	See legend on product drawing
<b>Condensation drainage holes</b>	On rotor side
<b>Mode</b>	S1
<b>Motor bearing</b>	Ball bearing
<b>Technical features</b>	<ul style="list-style-type: none"> <li>- Operation and alarm display with LED</li> <li>- External 15-50 VDC input (parameterization)</li> <li>- Alarm relay</li> <li>- Integrated PI controller</li> <li>- Configurable inputs/outputs (I/O)</li> <li>- MODBUS V6.3</li> <li>- Motor current limitation</li> <li>- RS-485 MODBUS-RTU</li> <li>- Soft start</li> <li>- Voltage output 3.3-24 VDC, Pmax = 800 mW</li> <li>- Control interface with SELV potential safely disconnected from the mains</li> <li>- Thermal overload protection for electronics/motor</li> <li>- Line undervoltage / phase failure detection</li> </ul>
<b>EMC immunity to interference</b>	According to EN 61000-6-2 (industrial environment)
<b>EMC interference emission</b>	According to EN 61000-6-3 (household environment), except EN 61000-3-2 for professionally used equipment with a total rated power greater than 1 kW
<b>Touch current according to IEC 60990 (measuring circuit Fig. 4, TN system)</b>	<= 3.5 mA
<b>Electrical hookup</b>	Terminal box
<b>Motor protection</b>	Electronic motor protection

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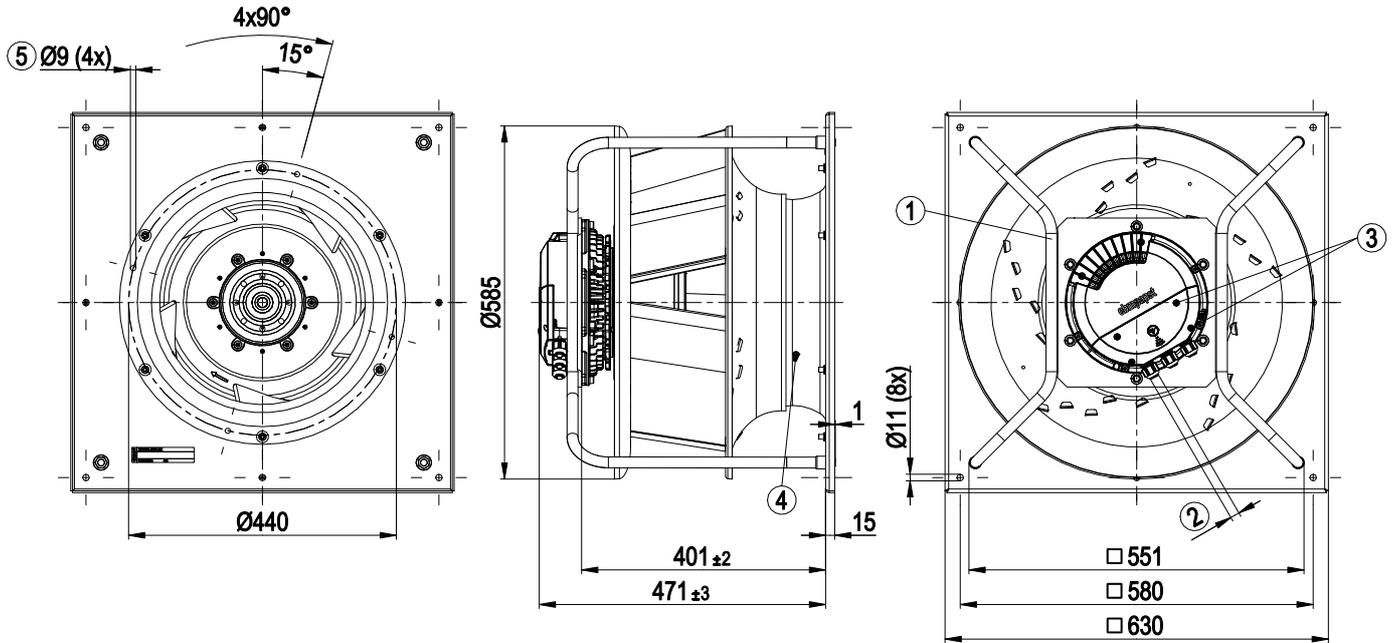
<b>Protection class assignment</b>	I; If a protective earth is connected by the customer This component for installation may have several local protection classes. This information relates to this component's basic design. The final protection class is based on the component's intended installation and connection.
<b>Conformity with standards</b>	EN 61800-5-1; CE
<b>Approval</b>	CSA C22.2 No. 77 + CAN/CSA-E60730-1; EAC; UL 1004-7 + 60730-1



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## Product drawing



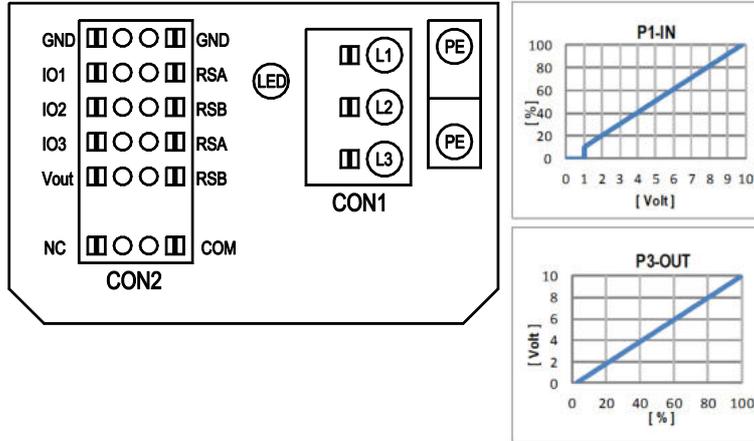
1	Installed position: shaft horizontal (install support struts only vertically as illustrated) or rotor on bottom; rotor on top on request
2	Cable diameter min. 4 mm, max. 10 mm, tightening torque $4 \pm 0.6$ Nm (The tightening torque is designed for PVC cables. If the cable materials are different, the tightening torque may have to be adjusted)
3	Tightening torque $1.5 \pm 0.2$ Nm
4	Inlet ring with pressure tap (k-factor: 281)
5	Attachment holes for FlowGrid 35505-2-2957 (not included in scope of delivery)



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## Connection diagram



No.	Conn.	Designation	Function/assignment
	CON1	L1, L2, L3	Power supply, phase, see nameplate for voltage range
	PE	PE	Protective earth
	CON2	RSA	RS485 interface for MODBUS, RSA; SELV
	CON2	RSB	RS485 interface for MODBUS, RSB; SELV
	CON2	GND	Reference ground for control interface, SELV
	CON2	IO1	Function parameterizable (see "Optional interface functions" table) Factory setting: Digital input - high active, function: Disable input, SELV - inactive: Pin open or applied voltage < 1.5 VDC - active: applied voltage 3.5-50 VDC Reset function: Triggering of error reset on change of state from "enabled" to "disabled"
	CON2	IO2	Function parameterizable (see "Optional interface functions" table) Factory setting: Analog input 0-10 V / PWM, Ri=100 kΩ, function: Set value Characteristic curve parameterizable (see input characteristic curve P1-IN), SELV
	CON2	IO3	Function parameterizable (see "Optional interface functions" table) Factory setting: Analog output 0-10 V, max. 5 mA, function: Fan modulation level Characteristic curve parameterizable (see output characteristic curve P3-OUT), SELV
	CON2	Vout	Voltage output 3.3-24 VDC ±5%, Pmax=800 mW, voltage parameterizable Factory setting: 10 VDC short-circuit-proof, supply for external devices, SELV alternatively: 15-50 VDC input for parameterization via MODBUS without line voltage
	CON2	COM	Status relay, floating status contact, common connection, contact rating 250 VAC / 2 A (AC1) / min. 10 mA, reinforced insulation on supply side and on control interface side
	CON2	NC	Status relay, floating status contact, break for failure
		LED	green: status = good, ready for operation orange: status = warning red: status = failure
		P1-IN	Input characteristic curve
		P3-OUT	Output characteristic curve



## Terminal/plug assignment

CON2	configurable IO mode	electrical specification	configurable IO functions: normal / inverse	MODBUS Register for IO mode configuration	
				D158 [0]	D158 [1]
IO1	○ Din1 (active high), digital input	active: applied voltage 3.5-50VDC, SELV not active: pin open or applied voltage < 1.5VDC		○	
	○ Ain1 0-10V/PWM: analog input	RI = 100k, characteristic curve parameterizable, $f_{PWM} = 1k..10kHz$ , SELV			
	○ Tach out (open collector output)	Umax = 50VDC, Imax = 20mA, SELV			
	○ Diagnostics out (open collector output)	Umax = 50VDC, Imax = 20mA, SELV			
IO2	○ Din2 (active high), digital input	active: applied voltage 3.5-50VDC, SELV not active: pin open or applied voltage < 1.5VDC		○	
	○ Ain2 0-10V/PWM: analog input	RI = 100k, characteristic curve parameterizable, $f_{PWM} = 1k..10kHz$ , SELV			
	○ Ain2 4-20mA: analog input	RI = 125R, characteristic curve parameterizable, SELV			
	○ Din3 (active high), digital input	active: applied voltage 3.5-50VDC, SELV not active: pin open or applied voltage < 1.5VDC			
IO3	○ Din3 (active low), digital input	active: applied voltage < 1.5VDC, SELV not active: pin open or applied voltage < 1.5VDC		○	
	○ PWMIn3: digital input, idle level high	PWM = 40Hz - 10kHz, characteristics parameterizable			
	○ PWMIn3: digital input, idle level low	active: pin open or applied voltage 3.5-50VDC not active: applied voltage < 1.5VDC, SELV			
	○ Aout3 0-10V: analog output	function parameterizable, max. 5mA max output frequency 300Hz, SELV			
RSA	○ Tacho out (pulses), analog output	0-10V/max. 5mA max output frequency 300Hz, SELV			
	○ Diagnostics out (pulses)	0-10V/max. 5mA max output frequency 300Hz, SELV			
	○ Diagnostics out (pulses)	MODBUS RTU, specification V6.3, SELV			
RSB	RS485 bus connection,				
Vout	voltage output	voltage parameterizable 3.3..24VDC +/- 5%, Pmax=600mW, short-circuit-proof, supply for external devices, SELV			
	alternatively: Input auxiliary power supply for parameterization via RS485/MODBUS RTU without line voltage	15..50VDC			

terminal	signal	direction	switch	source
D101 [..]	source: set value			○
D147 [..]	source: sensor value			○
D104 [..]	switch: parameter set: #1 / #2		○	○
D12E [..]	switch: control function: heating (pos.) cooling (neg.)		○	○
D148 [..]	switch: direction of rotation: cw / ccw		○	○
D16C [..]	switch: set value source		○	○
D16A [..]	switch: fan enable / disable		○	○
(selected directly via IO mode)	signal: tach out		○	
(selected directly via IO mode)	signal: diagnostics out			○
D130 [0]	signal: fan modulation level %			○
D130 [1]	signal: actual speed			○
D130 [2]	signal: system modulation level %			○
D130 [5]	signal: remote control output 0-10V			○
D00C [1]	pulse input for auto-addressing		○	
D130 [4]	pulse output for auto-addressing			

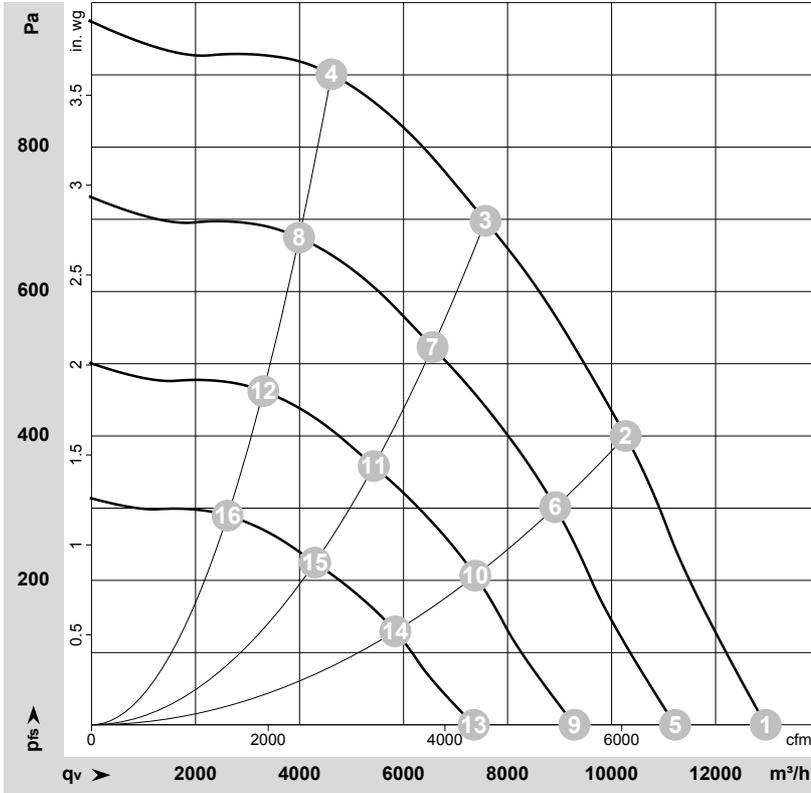
○ configurable option  
For further information and additional functions see EC Control Software, Fan-Set-App, or MODBUS Parameter Specification V6.3



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## Curves: Air performance 50 Hz



$\rho = 1.15 \text{ kg/m}^3 \pm 2 \%$

Measurement: LU-194543-1

Air performance measured according to ISO 5801 installation category A. For detailed information on the measurement setup, contact ebmpapst. Intake sound level: Sound power level according to ISO 13347 / sound pressure level measured at 1 m distance from fan axis. The values given are valid under the specified measuring conditions and may vary due to conditions of installation. For deviations from the standard configuration, the parameters have to be checked on the installed unit.

## Measured values

	Wired	U	f	n	P <sub>ed</sub>	I	LpA <sub>in</sub>	LwA <sub>in</sub>	LwA <sub>out</sub>	q <sub>v</sub>	p <sub>fs</sub>	q <sub>v</sub>	p <sub>fs</sub>
		V	Hz	min <sup>-1</sup>	W	A	dB(A)	dB(A)	dB(A)	m <sup>3</sup> /h	Pa	cfm	in. wg
1	3~	400	50	1670	1338	2.17	94	100	100	12960	0	7630	0.00
2	3~	400	50	1670	2019	3.16	84	89	90	10270	400	6045	1.61
3	3~	400	50	1670	2350	3.60	72	80	84	7575	700	4460	2.81
4	3~	400	50	1670	2177	3.39	76	83	89	4615	900	2715	3.61
5	3~	400	50	1450	868	1.41	91	97	96	11220	0	6605	0.00
6	3~	400	50	1450	1321	2.06	80	86	87	8915	302	5250	1.21
7	3~	400	50	1450	1518	2.35	69	76	80	6560	524	3860	2.10
8	3~	400	50	1450	1411	2.19	72	80	85	3995	678	2350	2.72
9	3~	400	50	1200	492	0.80	86	92	92	9285	0	5465	0.00
10	3~	400	50	1200	749	1.17	76	81	82	7380	206	4345	0.83
11	3~	400	50	1200	861	1.33	64	71	75	5430	359	3195	1.44
12	3~	400	50	1200	800	1.24	67	75	80	3305	464	1945	1.86
13	3~	400	50	950	244	0.40	80	86	86	7350	0	4325	0.00
14	3~	400	50	950	372	0.58	70	75	76	5840	129	3440	0.52
15	3~	400	50	950	427	0.66	58	65	69	4295	225	2530	0.90
16	3~	400	50	950	397	0.62	61	69	74	2615	291	1540	1.17

Wired = Wiring · U = Voltage · f = Frequency · n = Speed (rpm) · P<sub>ed</sub> = Power consumption · I = Current draw · LpA<sub>in</sub> = Sound pressure level intake side · LwA<sub>in</sub> = Sound power level intake side  
LwA<sub>out</sub> = Sound power level outlet side · q<sub>v</sub> = Air flow · p<sub>fs</sub> = Pressure increase

