

EC centrifugal module - RadiPac

backward-curved, single-intake
with support bracket

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Amtsgericht (court of registration) Stuttgart · HRB 590142

Nominal data

Type	K3G450-PB29-L1	
Motor	M3G150-IF	
Phase		3~
Nominal voltage	VAC	400
Nominal voltage range	VAC	380 .. 480
Frequency	Hz	50/60
Method of obtaining data		ml
Speed (rpm)	min ⁻¹	2800
Power consumption	W	6800
Current draw	A	10.3
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 η_{es}	%	68.8	60.1	09 Power consumption P_{ed}	kW	6.57
02 Measurement category		A		09 Air flow q_v	m ³ /h	9035
03 Efficiency category		Static		09 Pressure increase p_{fs}	Pa	1749
04 Efficiency grade N		70.7	62	10 Speed (rpm) n	min ⁻¹	2795
05 Variable speed drive		Yes		11 Specific ratio*		1.02

Data obtained at optimum efficiency level.

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

LU-210501

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 ebm-papst. 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

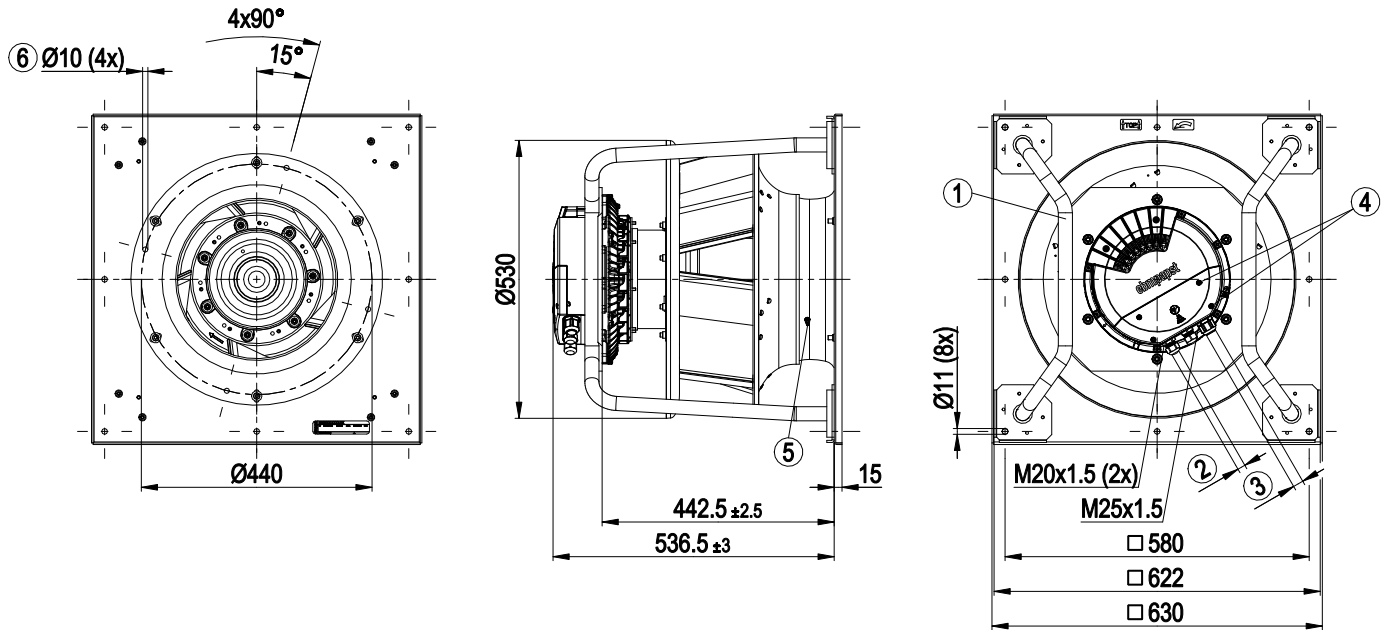
Weight	45.1 kg
Size	450 mm
Motor size	150
Rotor surface	Painted black
Electronics housing material	Die-cast aluminum
Impeller material	Sheet aluminum
Support plate material	Sheet steel, galvanized
Support bracket material	Steel, painted black
Inlet nozzle material	Sheet steel, galvanized
Number of blades	5
Direction of rotation	Clockwise, viewed toward rotor
Degree of protection	IP55
Insulation class	"F"
Moisture (F) / Environmental (H) protection class	H1
Ambient temperature note	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.
Max. permitted ambient temp. for motor (transport/storage)	+80 °C
Min. permitted ambient temp. for motor (transport/storage)	-40 °C
Installation position	See legend on product drawing
Condensation drainage holes	On rotor side
Mode	S1
Motor bearing	Ball bearing
Technical features	- Operation and alarm display with LED - External 15-50 VDC input (parameterization) - Alarm relay - Integrated PI controller - Configurable inputs/outputs (I/O) - MODBUS V6.4 - Motor current limitation - RS-485 MODBUS-RTU - Soft start - Voltage output 3.3-24 VDC, Pmax = 800 mW - Control interface with SELV potential safely disconnected from the mains - Thermal overload protection for electronics/motor - Line undervoltage / phase failure detection - Vibration sensor
Power Factor Correction (PFC)	Passive (through low-capacitance DC link)
EMC immunity to interference	According to EN 61000-6-2 (industrial environment)
EMC interference emission	According to EN 61000-6-4 (industrial environment)
Touch current according to IEC 60990 (measuring circuit Fig. 4, TN system)	<= 3.5 mA
Electrical hookup	Terminal box
Motor protection	Electronic motor protection

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Protection class assignment	I; If a protective earth is connected. The built-in component has several local protection class assignments. The final protection class is determined by the intended installation.
Conformity with standards	EN 61800-5-1; CE
Approval	CSA C22.2 No. 77 + CAN/CSA-E60730-1; EAC; UL 1004-7 + 60730-1

Product drawing



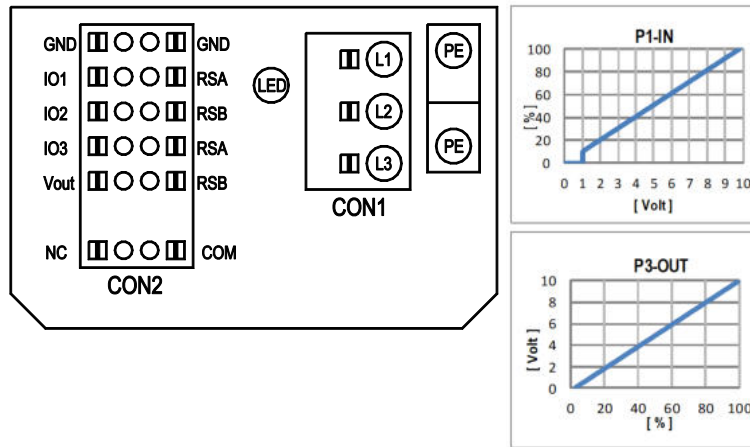
1	Installed position: shaft horizontal (install support struts only vertically as illustrated) or rotor on bottom; rotor on top on request
2	Cable diameter min. 4 mm, max. 10 mm, tightening torque 4 ± 0.6 Nm
3	Cable diameter min. 5 mm, max. 14 mm, tightening torque 6 ± 0.9 Nm
	(The tightening torque is designed for PVC cables. If the cable materials are different, the tightening torque may have to be adjusted)
4	Tightening torque 3 ± 0.3 Nm
5	Inlet ring with pressure tap (k-factor: 240)
6	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

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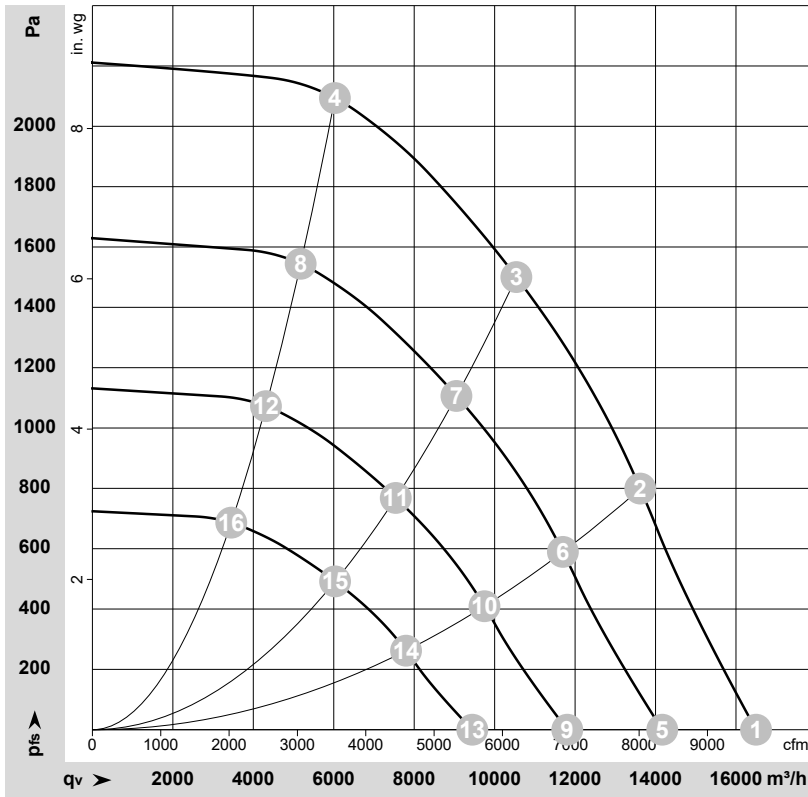
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Terminal/plug assignment

○ configurable option		configurable IO functions: normal / inverse	MODBUS Register for IO mode configuration	electrical specification	CON2	configurable IO mode	OUTPUT																																
○ Din1 (active high): digital input							D158 [0]	○	switch: fan enable / disable	D16A [...]	(selected directly via IO mode)	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																
○ Ain1 0-10V/PWM: analog input		D158 [2]	RI = 100K, characteristic curve parameterizable, $f_{PWM} = 1k..10kHz$, SELV	○	IO1	○	switch: control function: heating (pos.) / cooling (neg.)	○	switch: direction of rotation: cw / ccw	D148 [...]	switch: set value source	D16C [...]	(selected directly via IO mode)	D130 [10]	signal: fan modulation level %	D130 [11]	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																
○ Tach out (open collector output)																								D158 [5]	○	switch: tach out	(selected directly via IO mode)	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
○ Diagnostics out (open collector output)																								D158 [6]	○	switch: tach out	(selected directly via IO mode)	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
○ Din2 (active high): digital input																								D159 [0]	○	switch: tach out	(selected directly via IO mode)	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
○ Ain2 0-10V/PWM: analog input		D159 [2]	RI = 100K, characteristic curve parameterizable, $f_{PWM} = 1k..10kHz$, SELV	○	IO2	○	switch: control function: heating (pos.) / cooling (neg.)	○	switch: direction of rotation: cw / ccw	D148 [...]	switch: set value source	D16C [...]	(selected directly via IO mode)	D130 [10]	signal: fan modulation level %	D130 [11]	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																
○ Ain2 4-20mA: analog input																								D159 [3]	○	switch: tach out	(selected directly via IO mode)	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
○ Din3 (active high): digital input		D15A [0]	active: applied voltage 3.5-50VDC, SELV not active: pin open or applied voltage < 1.5VDC	○	IO3	○	switch: control function: heating (pos.) / cooling (neg.)	○	switch: direction of rotation: cw / ccw	D148 [...]	switch: set value source	D16C [...]	(selected directly via IO mode)	D130 [10]	signal: fan modulation level %	D130 [11]	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																
○ Din3 (active low): digital input		D15A [1]	active: applied voltage < 1.5VDC, SELV not active: pin open or applied voltage 3.5-50VDC	○		○	switch: tach out	(selected directly via IO mode)	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																			
○ PWMIn3: digital input idle level high		D15A [7]	PWM = 40Hz - 10kHz, characteristics parameterizable active: pin open or applied voltage 3.5-50VDC not active: applied voltage < 1.5VDC, SELV	○		○	switch: tach out	(selected directly via IO mode)	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																			
○ PWMIn3: digital input idle level low		D15A [8]	40Hz - 10kHz, characteristics parameterizable active: applied voltage 3.5-50VDC not active: pin open or applied voltage < 1.5VDC, SELV	○		○	switch: tach out	(selected directly via IO mode)	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																			
○ Aout3 0-10V: analog output		D15A [4]	function parameterizable, max. 5mA max output frequency 300Hz, SELV	○	RSA RSB	○	switch: control function: heating (pos.) / cooling (neg.)	○	switch: direction of rotation: cw / ccw	D148 [...]	switch: set value source	D16C [...]	(selected directly via IO mode)	D130 [10]	signal: fan modulation level %	D130 [11]	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																
○ Tacho out (pulses), analog output		D15A [5]	0-10V max. 5mA max output frequency 300Hz, SELV	○		○	switch: tach out	(selected directly via IO mode)	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																			
○ Diagnostics out (pulses)		D15A [6]	0-10V max. 5mA max output frequency 300Hz, SELV	○		○	switch: tach out	(selected directly via IO mode)	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																			
RSA RSB			MODBUS RTU, specification V6.4, SELV	○		○	switch: control function: heating (pos.) / cooling (neg.)	○	switch: direction of rotation: cw / ccw	D148 [...]	switch: set value source	D16C [...]	(selected directly via IO mode)	D130 [10]	signal: fan modulation level %	D130 [11]	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																
Vout			voltage output	D16E [...]																																			
			alternatively: input auxiliary power supply for parameterization via RS485/MODBUS RTU without line voltage																																				

For further information and additional functions see EC Control Software, Fan-Set-App,
or MODBUS Parameter Specification V6.4

Curves: Air performance 50 Hz



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

Measurement: LU-210501-1

Date: 2020-12-14

Nozzle: 45070-2-4013

Air performance measured according to ISO 5801 installation category A. For detailed information on the measurement setup, contact ebm-papst. 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 _{ed}	I	LpA _{in}	LwA _{in}	LwA _{out}	q _V	p _{fs}	q _V	p _{fs}
		V	Hz	min ⁻¹	W	A	dB(A)	dB(A)	dB(A)	m³/h	Pa	cfm	in. wg
1	3~	400	50	2800	3947	6.06	96	102	103	16500	0	9710	0.00
2	3~	400	50	2800	5683	8.65	88	95	97	13620	800	8015	3.21
3	3~	400	50	2800	6800	10.30	82	88	93	10540	1500	6205	6.02
4	3~	400	50	2800	6129	9.32	87	93	98	6030	2100	3550	8.43
5	3~	400	50	2400	2499	3.83	92	99	99	14165	0	8340	0.00
6	3~	400	50	2400	3599	5.48	84	91	93	11695	594	6885	2.38
7	3~	400	50	2400	4296	6.53	78	84	89	9050	1109	5325	4.45
8	3~	400	50	2400	3884	5.91	83	89	94	5180	1550	3050	6.22
9	3~	400	50	2000	1446	2.22	88	94	95	11805	0	6950	0.00
10	3~	400	50	2000	2083	3.17	79	86	89	9745	412	5735	1.65
11	3~	400	50	2000	2486	3.78	73	80	85	7540	770	4440	3.09
12	3~	400	50	2000	2247	3.42	78	85	89	4315	1077	2540	4.32
13	3~	400	50	1600	740	1.14	82	88	89	9445	0	5560	0.00
14	3~	400	50	1600	1066	1.62	74	81	83	7800	264	4590	1.06
15	3~	400	50	1600	1273	1.93	68	74	79	6035	493	3550	1.98
16	3~	400	50	1600	1151	1.75	73	79	84	3450	689	2030	2.77

Wired = Wiring · U = Voltage · f = Frequency · n = Speed (rpm) · P_{ed} = Power consumption · I = Current draw · LpA_{in} = Sound pressure level intake side · LwA_{in} = Sound power level intake side
 LwA_{out} = Sound power level outlet side · q_V = Air flow · p_{fs} = Pressure increase