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**Nominal data**

<b>Type</b>	<b>R3G450-PA31-03</b>	
<b>Motor</b>	<b>M3G150-FF</b>	
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>	2480
Power consumption	W	4450
Current draw	A	6.8
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

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), a fan design with special low-temperature bearings must be used.

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

		Actual	Req. 2015			
01 Overall efficiency $\eta_{es}$	%	69.3	58.3	09 Power consumption $P_{ed}$	kW	4.46
02 Measurement category		A		09 Air flow $q_v$	m <sup>3</sup> /h	8430
03 Efficiency category		Static		09 Pressure increase $p_{fs}$	Pa	1275
04 Efficiency grade N		73	62	10 Speed (rpm) n	min <sup>-1</sup>	2465
05 Variable speed drive		Yes		11 Specific ratio*		1.01

Data obtained at optimum efficiency level.

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

LU-205097

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

<b>Weight</b>	20.48 kg
<b>Size</b>	450 mm
<b>Motor size</b>	150
<b>Rotor surface</b>	Painted black
<b>Electronics housing material</b>	Die-cast aluminum
<b>Impeller material</b>	Sheet aluminum
<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>	Shaft horizontal or rotor on bottom; rotor on top on request
<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>Power Factor Correction (PFC)</b>	Passive (through low-capacitance DC link)
<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>	Reverse polarity and locked-rotor protection
<b>Protection class assignment</b>	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.
<b>Conformity with standards</b>	EN 61800-5-1; CE; UKCA

R3G450-PA31-03

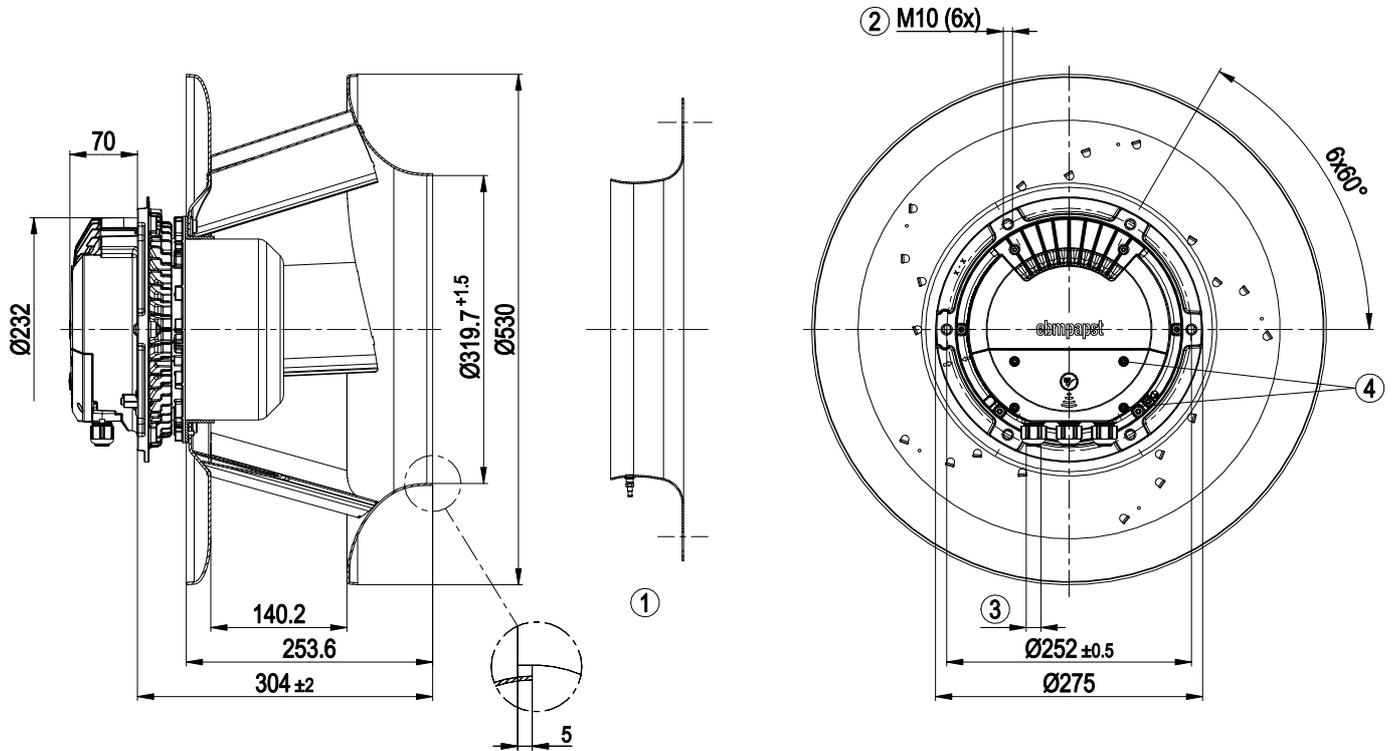
# EC centrifugal fan - RadiPac

backward-curved, single-intake

Approval

UL 1004-7 + 60730-1; EAC; CSA C22.2 No. 77 + CAN/CSA-E60730-1

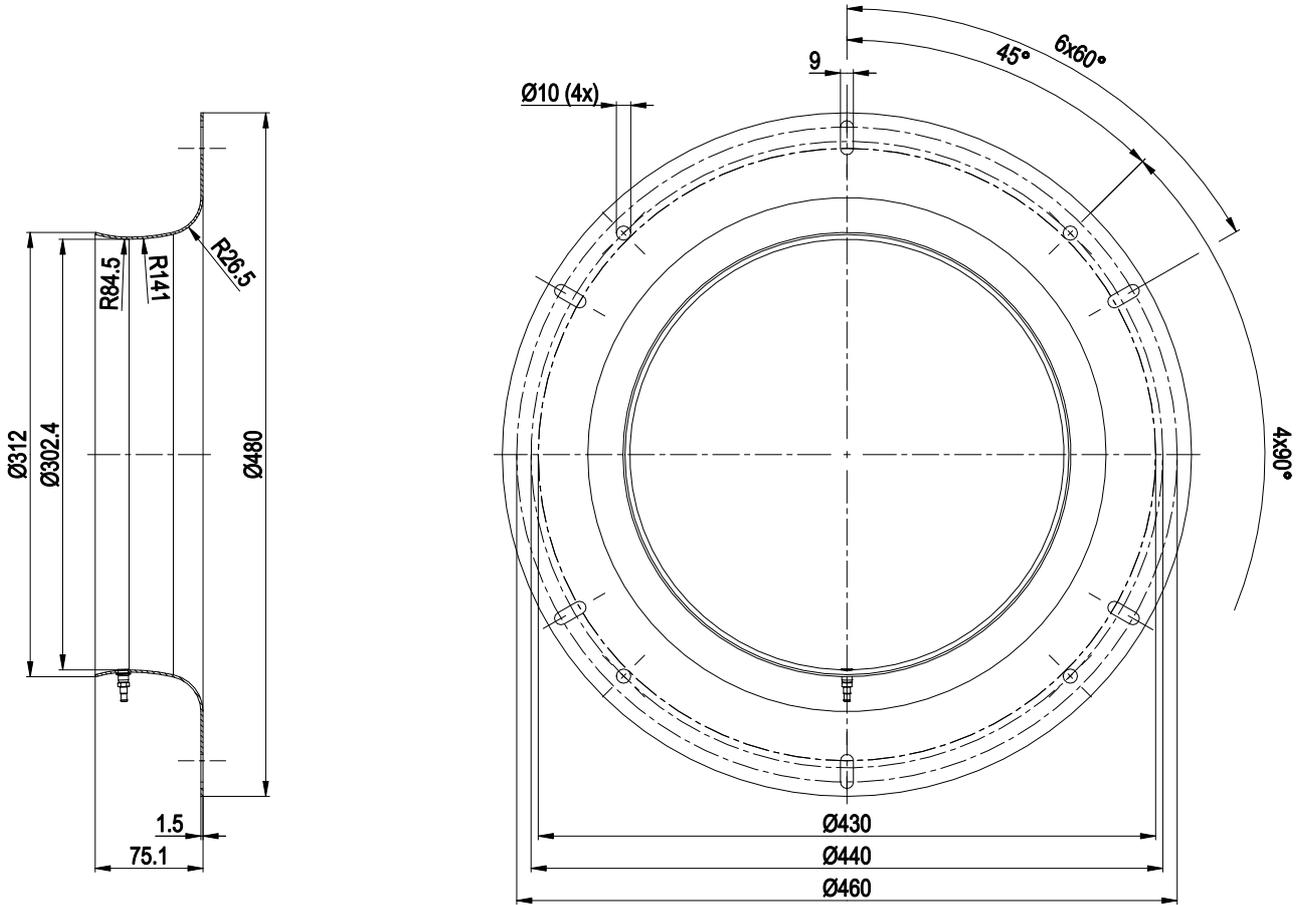
## Product drawing



(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 $1.5 \pm 0.2$ Nm
1	Accessory part: Inlet ring 45075-2-4013 with pressure tap (k-factor: 240) not included in scope of delivery
2	Max. clearance for screw 20 mm
3	Cable diameter min. 4 mm, max. 10 mm, tightening torque $4 \pm 0.6$ Nm

## Accessory part

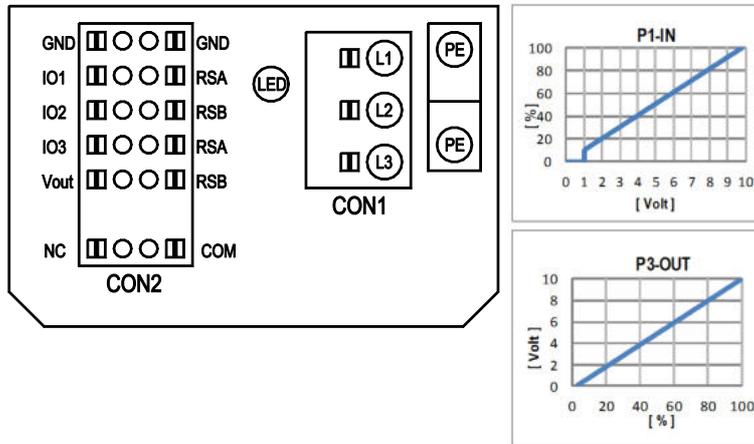


Inlet ring 45075-2-4013 with pressure tap (k-factor: 240)

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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

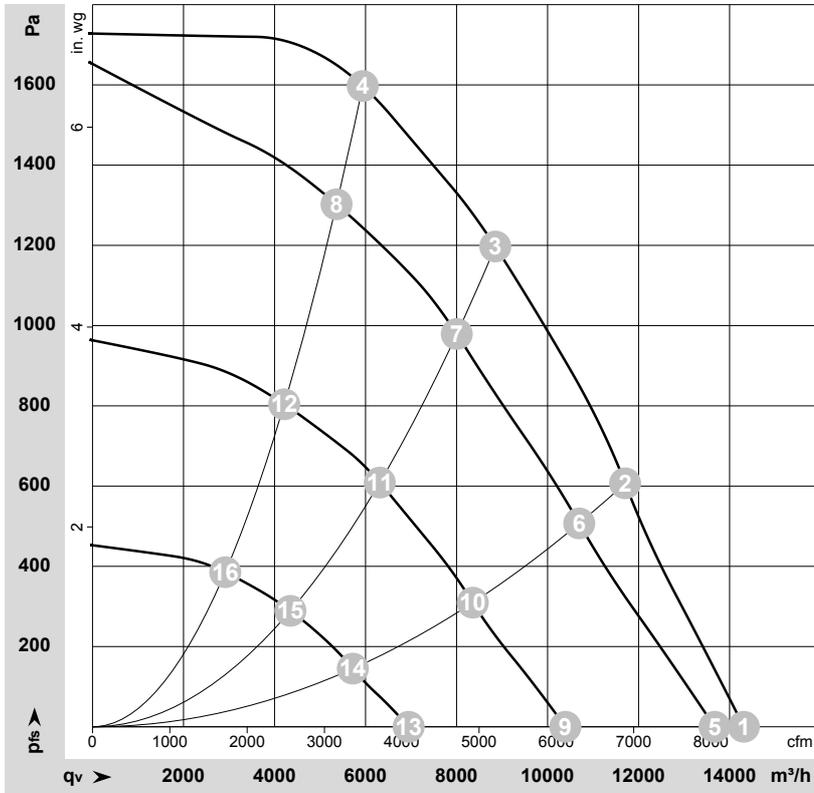
## Terminal/plug assignment

CON2	configurable IO mode	electrical specification	configurable IO functions: normal / inverse	MODBUS Register for IO mode configuration	
				source: set value	switch: fan enable / disable
IO1	○ Din1 (active high), digital input	active: applied voltage 3.5-50VDC, SELV not active: pin open or applied voltage < 1.5VDC		○	D158 [0]
	○ Ain1 0-10V/PWM: analog input	RI = 100k, characteristic curve parameterizable, $f_{PWM} = 1k..10kHz$ , SELV		○	D158 [2]
	○ Tach out (open collector output)	Umax = 50VDC, I <sub>max</sub> = 20mA, SELV		○	D158 [5]
	○ Diagnostics out (open collector output)	Umax = 50VDC, I <sub>max</sub> = 20mA, SELV		○	D158 [6]
IO2	○ Din2 (active high), digital input	active: applied voltage 3.5-50VDC, SELV not active: pin open or applied voltage < 1.5VDC		○	D159 [0]
	○ Ain2 0-10V/PWM: analog input	RI = 100k, characteristic curve parameterizable, $f_{PWM} = 1k..10kHz$ , SELV		○	D159 [2]
	○ Ain2 4-20mA: analog input	RI = 125R, characteristic curve parameterizable, SELV		○	D159 [3]
	○ Din3 (active high), digital input	active: applied voltage 3.5-50VDC, SELV not active: pin open or applied voltage < 1.5VDC		○	D15A [0]
IO3	○ Din3 (active low), digital input	active: applied voltage < 1.5VDC, SELV not active: pin open or applied voltage 3.5-50VDC		○	D15A [1]
	○ PWMIn3: digital input, idle level high	PWM = 40Hz - 10kHz, characteristics parameterizable		○	D15A [7]
	○ PWMIn3: digital input, idle level low	active: pin open or applied voltage 3.5-50VDC not active: applied voltage < 1.5VDC, SELV		○	D15A [8]
	○ Aout3 0-10V: analog output	function parameterizable, max. 5mA max output frequency 300Hz SELV		○	D15A [4]
RSA	○ Tacho out (pulses), analog output	0-10V/max. 5mA max output frequency 300Hz SELV		○	D15A [5]
	○ Diagnostics out (pulses)	0-10V/max. 5mA max output frequency 300Hz, SELV		○	D15A [6]
	○ RS485 bus connection,	MODBUS RTU, specification V6.3, SELV		○	
RSB	voltage output	voltage parameterizable 3.3..24VDC +/- 5%, P <sub>max</sub> =800mW, short-circuit-proof, supply for external devices, SELV		○	D16E [..]
Vout	alternatively: Input auxiliary power supply for parameterization via RS485/MODBUS RTU without line voltage	15..50VDC		○	

○ configurable option

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

## Curves: Air performance 50 Hz



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

Measurement: LU-205097-1  
Date: 2020-02-20  
Nozzle: 45070-2-4013

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	2480	2775	4.26	91	99	99	14310	0	8425	0.00
2	3~	400	50	2480	3925	5.98	85	92	95	11705	600	6890	2.41
3	3~	400	50	2480	4450	6.80	78	85	91	8850	1200	5210	4.82
4	3~	400	50	2480	4413	6.71	82	89	94	5940	1600	3495	6.42
5	3~	400	50	2365	2421	3.74	90	97	98	13670	0	8045	0.00
6	3~	400	50	2260	2968	4.56	82	89	93	10695	507	6295	2.04
7	3~	400	50	2225	3286	5.03	75	83	89	8005	980	4710	3.93
8	3~	400	50	2230	3210	4.91	80	86	91	5365	1305	3155	5.24
9	3~	400	50	1815	1132	1.87	84	91	92	10390	0	6115	0.00
10	3~	400	50	1775	1451	2.33	76	83	87	8355	309	4920	1.24
11	3~	400	50	1755	1624	2.58	69	77	82	6310	609	3715	2.44
12	3~	400	50	1755	1574	2.50	72	80	85	4215	806	2480	3.24
13	3~	400	50	1240	422	0.92	73	81	84	6950	0	4090	0.00
14	3~	400	50	1220	518	1.05	66	73	77	5720	145	3365	0.58
15	3~	400	50	1215	578	1.14	60	68	73	4350	289	2560	1.16
16	3~	400	50	1215	567	1.12	62	70	75	2915	386	1715	1.55

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