R3G500-RA28-03

EC centrifugal fan - RadiCal

backward-curved, single-intake

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Nominal data

Type	**R3G500-RA28-03**
Motor	**M3G150-FF**

Phase		3~
Nominal voltage	VAC	400
Nominal voltage range	VAC	380 .. 480
Frequency	Hz	50/60
Method of obtaining data		ml
Status		prelim.
Speed (rpm)	min^{-1}	1900
Power consumption	W	3650
Current draw	A	5.6
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

		Actual	Req. 2015
01 Overall efficiency η_{es}	%	63.1	57.4
02 Measurement category		A	
03 Efficiency category		Static	
04 Efficiency grade N		67.7	62
05 Variable speed drive		Yes	

09 Power consumption P_{ed}	kW	3.65
09 Air flow q_v	m^3/h	8095
09 Pressure increase p_{fs}	Pa	983
10 Speed (rpm) n	min^{-1}	1905
11 Specific ratio*		1.01

Data obtained at optimum efficiency level.
The ErP data is determined using a motor-impeller combination in a standardized measurement setup.

* Specific ratio = 1 + p_{fs} / 100 000 Pa

LU-182081

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Technical description

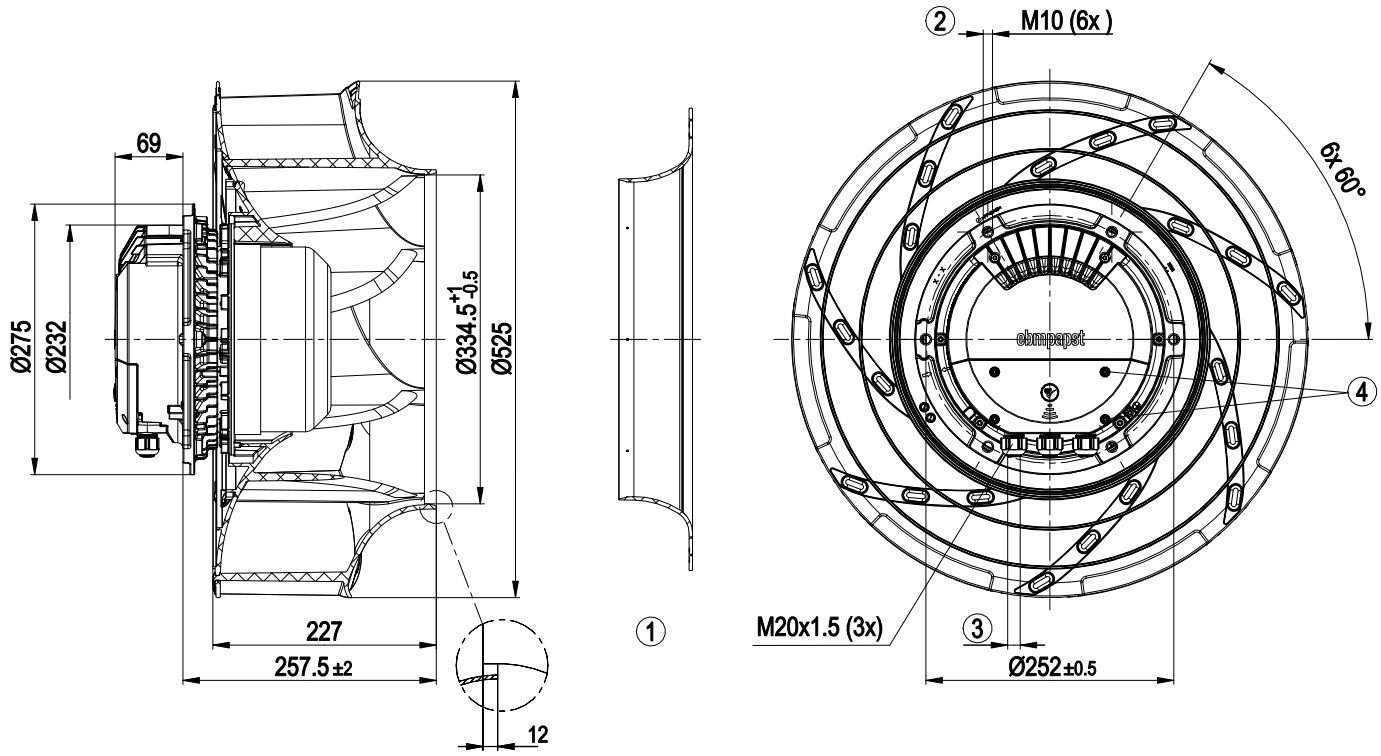
Weight	21.9 kg
Size	500 mm
Motor size	150
Rotor surface	Painted black
Electronics housing material	Die-cast aluminum
Impeller material	PP plastic
Number of blades	7
Direction of rotation	Clockwise, viewed toward rotor
Degree of protection	IP55
Insulation class	"F"
Moisture (F) / Environmental (H) protection 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	Shaft horizontal or rotor on bottom; rotor on top on request
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 - Motor current limitation - RFID - ISO 15693 compatible - RS-485 MODBUS-RTU - Soft start - EEPROM write cycles: 100,000 maximum - 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
Touch current according to IEC 60990 (measuring circuit Fig. 4, TN system)	<= 3.5 mA
Electrical hookup	Terminal box
Motor protection	Reverse polarity and locked-rotor protection
Protection class	I (with customer connection of protective earth)
Conformity with standards	EN 61800-5-1; CE
Approval	CSA C22.2 No. 77 + CAN/CSA-E60730-1; EAC; UL 1004-7 + 60730

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Product drawing



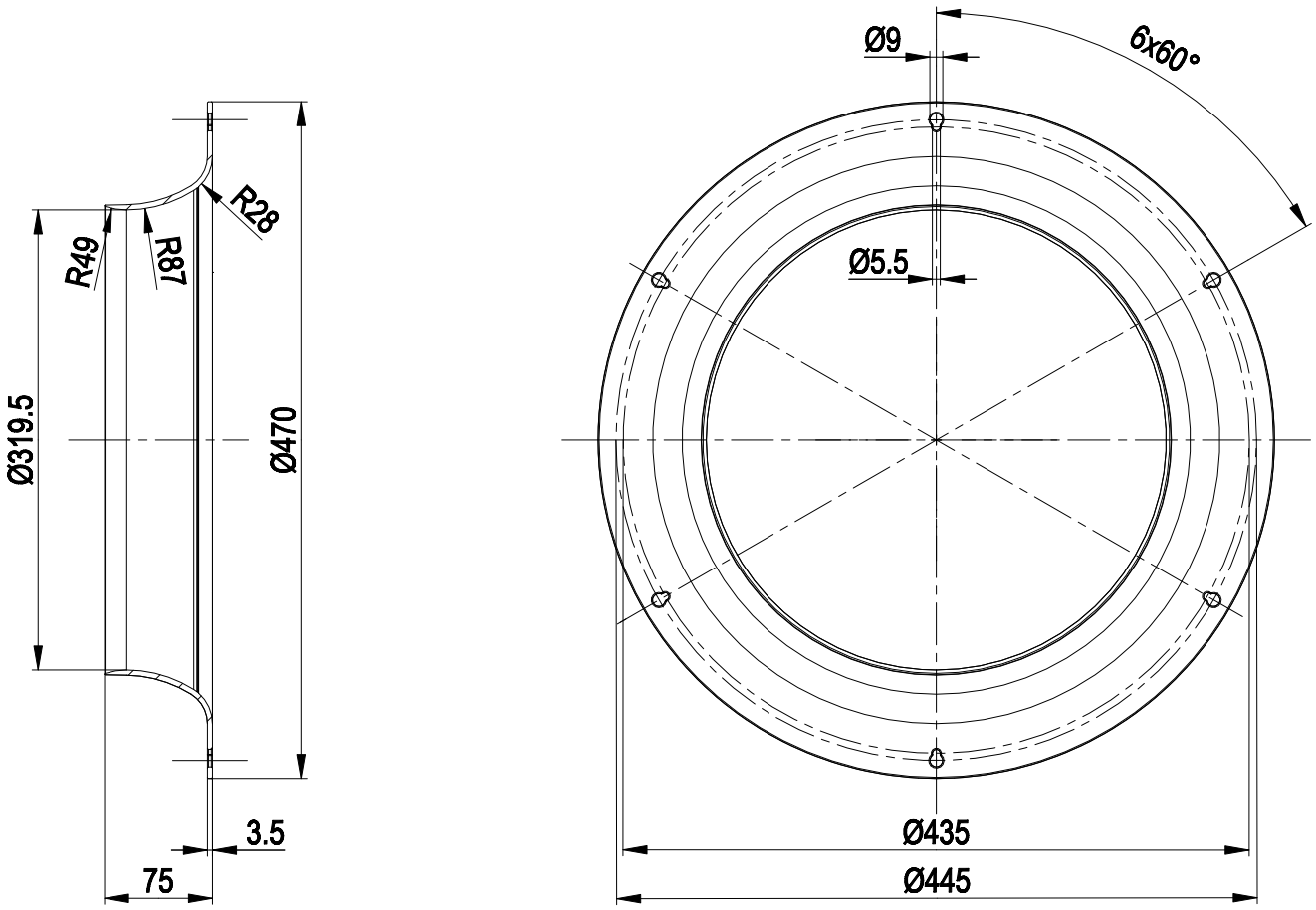
1	Accessory part: inlet ring 50901-2-2943 not included in scope of delivery
2	Max. clearance for screw 20 mm
3	Cable diameter min. 4 mm, max. 10 mm, tightening torque 2 ± 0.3 Nm
4	Tightening torque 1.5 ± 0.2 Nm

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Accessory part



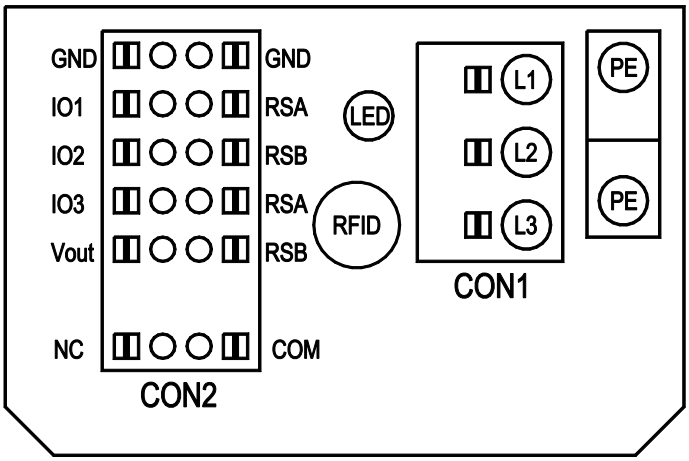
1	Accessory part: inlet ring 50901-2-2943

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Connection diagram



No.	Conn.	Designation	Function/assignment
CON1	-	L1, L2, L3	Supply connection, power supply, protection class 1
PE	-	PE	Ground connection, PE connection
CON2	-	RSA	Bus connection RS485, RSA, MODBUS-RTU; SELV
CON2	-	RSB	Bus connection RS485, RSB, MODBUS-RTU; SELV
CON2	-	GND	GND reference ground for control interface, SELV
CON2	-	IO1	IN2: Digital input - positive logic (factory setting: Enable) function parameterizable, SELV - normal: Pin open or applied voltage < 1.5 VDC - inverse: applied voltage 3.5-50 VDC
CON2	-	IO2	IN1: Analog input 0-10 V 0-10 V, Ri=100 K, parameterizable as set value or measured value (factory setting: set value) characteristic curve parameterizable, SELV
CON2	-	IO3	OUT1: Analog output 0-10 V 0-10 V, max 5 mA, function parameterizable (factory setting: modulation level) max output frequency 300 Hz, SELV
CON2	-	V out	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, nominal voltage 250 VAC; max 2 A (AC1): min 10 mA; Reinforced insulation in accordance with EN60335-1, EN61800-5-1, UL60730-1
CON2	-	NC	Status relay, floating status contact, break for failure

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Terminal/plug assignment

○ configurable option

For further information and additional functions see EC Control Software, Fan-Set-App, or MODBUS Parameter Specification V6.0

	Factory setting:	
IO1	Din1 (high aktiv)	switch: fan enable / disable
IO2	Ain2 0-10V/PWM	source: set value
IO3	Aout3 0-10V	signal: fan modulation level %
RSA RSB	RS485 Busschnittstelle	switch: parameter set: #1 / #2; switch: control function: heating (pos.) / cooling (neg.); switch: direction of rotation: cw / ccw; switch: set value source

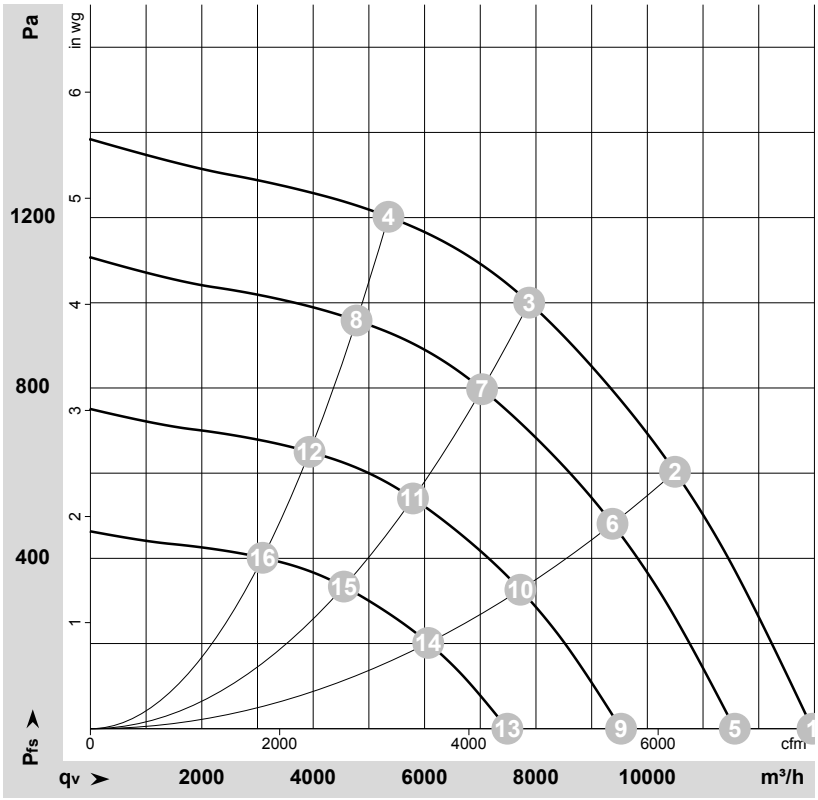
CON2	configurable IO mode	electrical specification	MODBUS Register for IO mode configuration	configurable IO functions: normal / inverse	INPUT: source: set value	INPUT: source: sensor value	INPUT: switch: parameter set: #1 / #2	INPUT: switch: control function: heating (pos.) / cooling (neg.)	INPUT: switch: direction of rotation: cw / ccw	INPUT: switch: set value source	INPUT: switch: fan enable / disable	OUTPUT: signal: tach out (selected directly via IO mode)	OUTPUT: signal: diagnostics out (selected directly via IO mode)	OUTPUT: signal: fan modulation level % D130 [0]	OUTPUT: signal: actual speed D130 [1]	OUTPUT: signal: system modulation level % D130 [2]	OUTPUT: signal: remote control output 0-10V D130 [5]	OUTPUT: pulse input for auto-adressing D00C [1]	OUTPUT: pulse output for auto-adressing D130 [4]
					D101 [...]	D147 [...]	D104 [...]	D12E [...]	D148 [...]	D16C [...]	D16A [...]									
IO1	● **Din1 (active high)**: digital input	not active: pin open or applied voltage < 1,5VDC active: applied voltage 3,5-50VDC, SELV	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, Imax=20mA SELV	D158 [5]									○								
	○ **Diagnostics out** (open collector output)	Umax=50VDC, Imax=20mA SELV	D158 [6]										○							
IO2	○ **Din2 (active high)**: digital input	not active: pin open or applied voltage < 1,5VDC active: applied voltage 3,5-50VDC, SELV	D159 [0]				○	○	○	○	○									
	● **Ain2 0-10V/PWM**: analog input	Ri=100K, characteristic curve parameterizable, fPWM=1k..10KHz, SELV	D159 [2]			○														
	○ **Ain2 4-20mA**: analog input	Ri=125R, characteristic curve parameterizable, SELV	D159 [3]			○														
IO3	○ **Din3 (active high)**: digital input	not active: pin open or applied voltage < 1,5VDC active: applied voltage 3,5-50VDC, SELV	D15A [0]				○	○	○	○	○									
	○ **Din3 (active low)**: digital input	active: pin open or applied voltage 3,5-50VDC not active: applied voltage < 1,5VDC, SELV	D15A [1]				○	○	○	○	○									
	○ **PWMin3**: digital input	40Hz - 10kHz, characteristics parameterizable not active: pin open or applied voltage 3,5-50VDC active: applied voltage < 1,5VDC, SELV	D15A [7]		○															
	● **Aout3 0-10V**: analog output	function parameterizable, max. 5mA, max output frequency 300Hz, SELV	D15A [4]											○		○	○			○
	○ **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]										○							
RSA RSB	RS485 bus connection,	MODBUS RTU, specification V6.0, SELV			○		○	○	○	○	○									
Vout	voltage output	voltage parameterizable 3,3...24VDC +/- 5,5%, Pmax=800mW, short-circuit-proof, supply for external devices, SELV	D16E [...]																	
	alternatively: Input auxiliary power supply for parameterization via RS485/MODBUS RTU without line	15...50VDC																		

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Curves: Air performance 50 Hz



ρ = 1.15 kg/m³ ± 2 %

Measurement: LU-182081-1

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

	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)	m^3/h	Pa	cfm	in. wg
1	400	50	1900	2554	3.95	82	89	96	12965	0	7630	0.00
2	400	50	1900	3485	5.34	77	85	91	10495	600	6180	2.41
3	400	50	1900	3650	5.60	73	80	87	7880	1000	4635	4.01
4	400	50	1900	3248	4.98	77	84	89	5350	1200	3150	4.82
5	400	50	1700	1815	2.80	79	86	93	11570	0	6810	0.00
6	400	50	1700	2482	3.80	74	82	88	9375	481	5515	1.93
7	400	50	1700	2584	3.96	70	77	84	7035	800	4140	3.21
8	400	50	1700	2313	3.55	74	82	86	4780	960	2815	3.85
9	400	50	1400	1014	1.57	74	81	88	9530	0	5610	0.00
10	400	50	1400	1386	2.12	70	77	84	7720	326	4545	1.31
11	400	50	1400	1443	2.21	65	72	79	5790	543	3410	2.18
12	400	50	1400	1292	1.98	69	77	81	3935	651	2315	2.61
13	400	50	1100	492	0.76	68	75	82	7485	0	4405	0.00
14	400	50	1100	672	1.03	63	71	77	6065	202	3570	0.81
15	400	50	1100	700	1.07	59	66	73	4550	335	2680	1.34
16	400	50	1100	626	0.96	63	71	75	3090	402	1820	1.61

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

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