

EC centrifugal fan

backward-curved, single-intake

for rail applications

R3G400-BE08-N1 ebmpapst Datasheet

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Nominal data

Type	R3G400-BE08-N1	
Motor	M3G112-IA	
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	2400
Power consumption	W	2400
Current draw	A	3.7
Min. ambient temperature	°C	-40
Max. ambient temperature	°C	60

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



Technical description

Weight	15.24 kg
Size	400 mm
Motor size	112
Rotor surface	Painted black
Electronics housing material	Die-cast aluminum, painted gray
Impeller material	Sheet aluminum
Number of blades	7
Direction of rotation	Clockwise, viewed toward rotor
Degree of protection	IP55
Insulation class	"F"
Moisture (F) / Environmental (H) protection class	H3
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; (sealed)
Technical features	<ul style="list-style-type: none"> - Operation and alarm display with LED - External 15-50 VDC input (parameterization) - Alarm relay - Integrated PI controller - Configurable inputs/outputs (I/O) - Run monitoring - MODBUS V6.3 - 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
EMC regulations	According to EN 50121-3-2
Touch current according to IEC 60990 (measuring circuit Fig. 4, TN system)	<= 3.5 mA
Electrical hookup	Terminal box
Motor protection	Electronic motor protection
Protection class assignment	<p>I; If a protective earth is connected by the customer</p> <p>This component for installation may have several local protection classes. This information relates to this component's basic design.</p> <p>The final protection class is based on the component's intended installation and connection.</p>
Conformity with standards	EN 15085-1, CPC3; EN 45545-2, HL3; EN 50155; EN 61373, Cat. 1B
Approval	EAC

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Comment

A prerequisite for operation is a Class 1 vehicle electrical system architecture according to EN 50533; if supply potential (e.g. 230 VAC) is passed through the alarm relay, the SELV signal wires lose their property of reinforced insulation and they then have only basic insulation

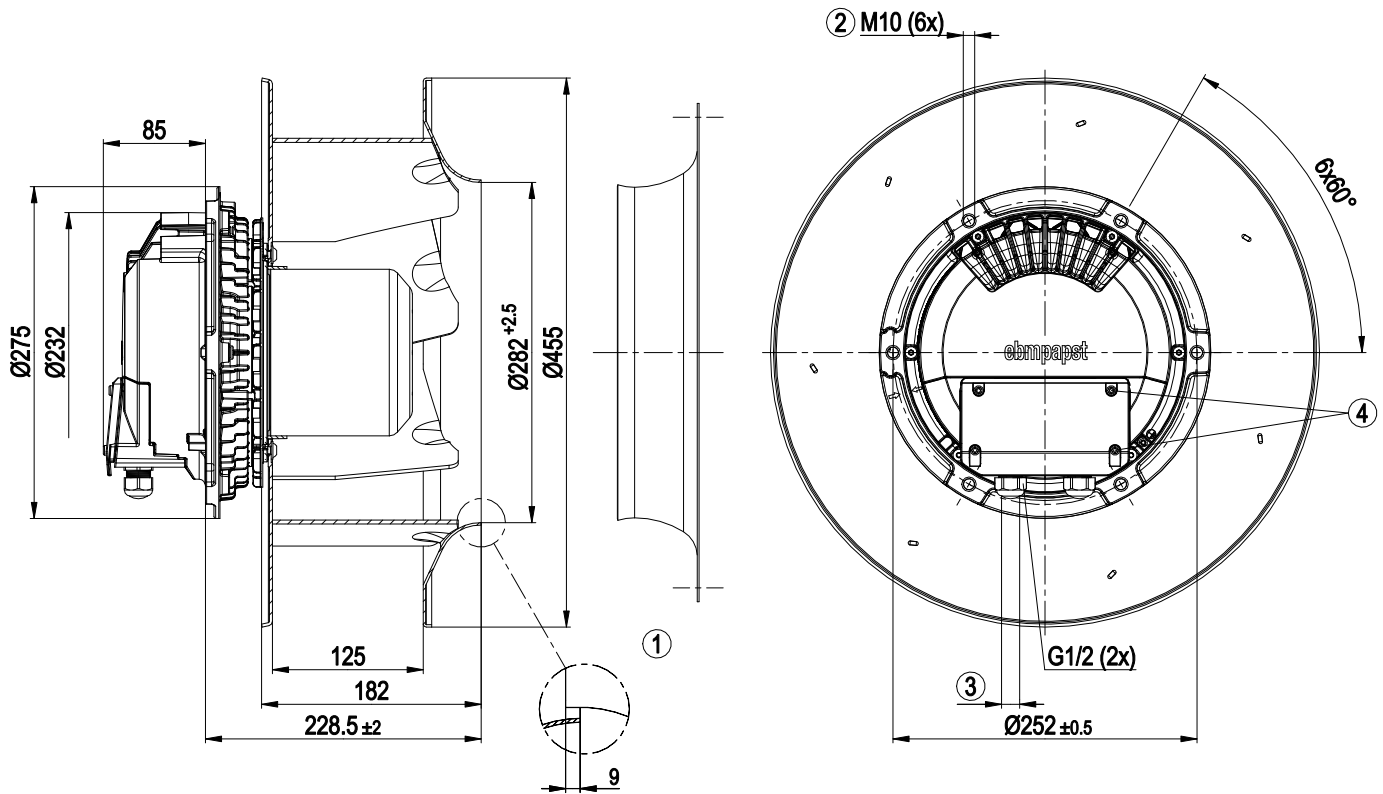
The SELV property (reinforced insulation) is not lost when voltages of up to 110 VDC are passed through the alarm relay. EMC regulation: EN 50121-3-2 in preparation



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Product drawing



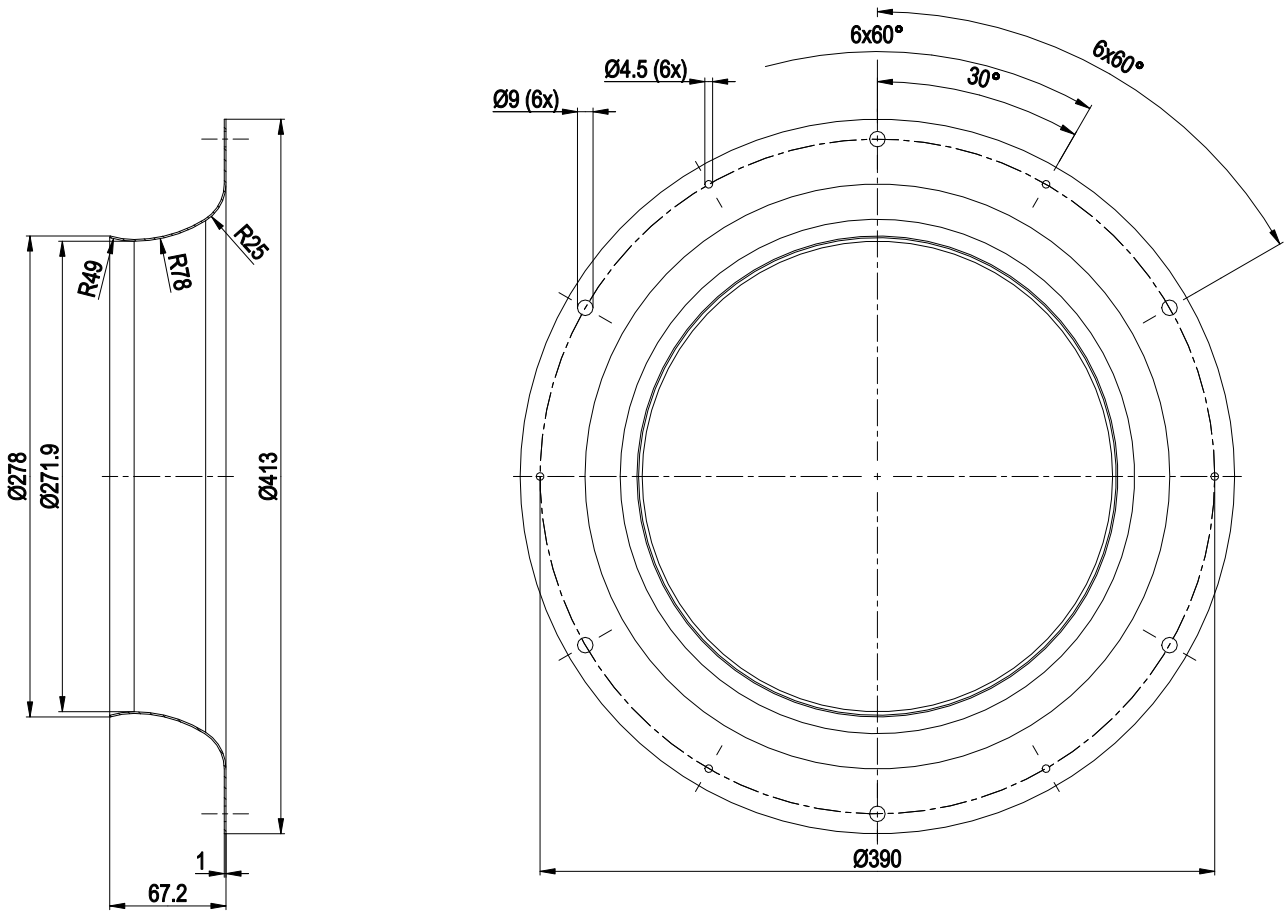
1	Accessory part: inlet ring 40070-2-4013 not included in scope of delivery
2	Max. clearance for screw 20 mm
3	Cable diameter min. 6 mm, max. 12 mm, tightening torque 4 ± 0.6 Nm (The tightening torque is designed for PVC cables. If the cable materials are different, the tightening torque may have to be adjusted)
4	Tightening torque 3.5 ± 0.5 Nm



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Accessory part



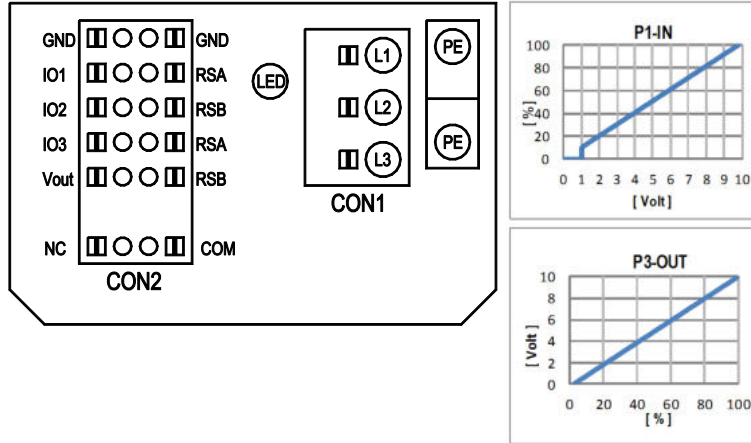
Inlet ring 40070-2-4013



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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

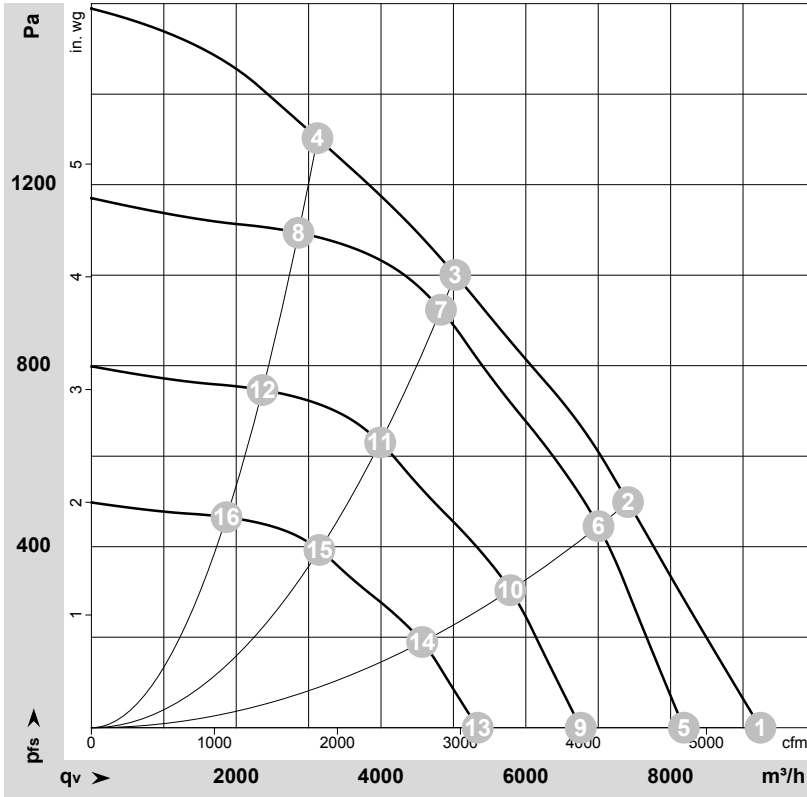
CON2	configurable IO mode	electrical specification	configurable IO functions: normal / inverse	MODBUS Register for IO mode configuration	
				source: set value	switch: fan enable / disable
IO1	○ Din1 (active high), digital input	active: applied voltage 3.5-50VDC, SELV not active: pin open or applied 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, Imax = 20mA, SELV		○	D158 [5]
	○ Diagnostics out (open collector output)	Umax = 50VDC, Imax = 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%, Pmax=600mW, 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-194294-1

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 _{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	3~	400	50	2600	2400	3.70	86	95	101	9240	0	5440	0.00
2	3~	400	50	2430	2400	3.70	81	89	95	7410	500	4365	2.01
3	3~	400	50	2400	2400	3.70	75	84	89	5025	1000	2960	4.01
4	3~	400	50	2505	2372	3.67	80	88	95	3120	1300	1840	5.22
5	3~	400	50	2300	1664	2.57	83	92	98	8180	0	4815	0.00
6	3~	400	50	2300	2027	3.14	79	88	94	7005	452	4125	1.81
7	3~	400	50	2300	2132	3.30	74	83	88	4830	931	2840	3.74
8	3~	400	50	2300	1836	2.84	78	86	93	2860	1100	1685	4.42
9	3~	400	50	1900	938	1.45	78	87	93	6760	0	3980	0.00
10	3~	400	50	1900	1143	1.77	74	83	89	5785	309	3405	1.24
11	3~	400	50	1900	1202	1.86	70	78	84	3990	636	2350	2.55
12	3~	400	50	1900	1035	1.60	73	82	88	2365	750	1390	3.01
13	3~	400	50	1500	462	0.71	72	81	87	5335	0	3140	0.00
14	3~	400	50	1500	562	0.87	68	77	83	4570	192	2690	0.77
15	3~	400	50	1500	592	0.92	64	72	78	3150	396	1855	1.59
16	3~	400	50	1500	509	0.79	67	76	82	1865	468	1100	1.88

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

