**R3G250-RY90-P1**

# EC centrifugal fan - RadiCal

backward-curved, single-intake

for rail applications

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## Nominal data

| | | |
|---|---|---|
| **Type** | **R3G250-RY90-P1** | |
| **Motor** | **M3G074-CF** | |
| Nominal voltage | VDC | 110 |
| Nominal voltage range | VDC | 77 .. 138 |
| Frequency | Hz | DC |
| Method of obtaining data | | ml |
| Speed (rpm) | $min^{-1}$ | 2950 |
| Power consumption | W | 250 |
| Current draw | A | 2.3 |
| 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

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

| | | Actual | Req. 2015 |
|---|---|---|---|
| 01 Overall efficiency $\eta_{es}$ | % | 52.9 | 45 |
| 02 Measurement category | | A | |
| 03 Efficiency category | | Static | |
| 04 Efficiency grade N | | 69.9 | 62 |
| 05 Variable speed drive | | Yes | |

| | | |
|---|---|---|
| 09 Power consumption $P_e$ | kW | 0.24 |
| 09 Air flow $q_v$ | $m^3/h$ | 905 |
| 09 Pressure increase $p_{fs}$ | Pa | 454 |
| 10 Speed (rpm) n | $min^{-1}$ | 2885 |
| 11 Specific ratio* | | 1.00 |

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-201168

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## Technical description

| | |
|---|---|
| **Weight** | 2.3 kg |
| **Size** | 250 mm |
| **Motor size** | 74 |
| **Electronics housing material** | Die-cast aluminum, painted black |
| **Impeller material** | PA plastic, sheet-metal plate painted black |
| **Number of blades** | 7 |
| **Direction of rotation** | Clockwise, viewed toward rotor |
| **Degree of protection** | Customer-specific; IP 6K9K |
| **Insulation class** | "B" |
| **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** | Any |
| **Condensation drainage holes** | None, open rotor |
| **Mode** | S1 |
| **Motor bearing** | Ball bearing; (sealed) |
| **Technical features** | - Output 10 VDC, max. 10 mA<br>- Alarm relay<br>- Power limiter<br>- Motor current limitation<br>- RS-485 MODBUS-RTU<br>- Soft start<br>- EEPROM write cycles: 100,000 maximum<br>- Control input 0-10 VDC / PWM<br>- Control interface with SELV potential safely disconnected from the mains<br>- Overvoltage detection<br>- Thermal overload protection for electronics<br>- Line undervoltage detection<br>- Reverse polarity protection |
| **EMC regulations** | According to EN 50121-3-2 |
| **Motor protection** | Electronic motor protection |
| **With cable** | Lateral |
| **Protection class** | I (with customer connection of protective earth) |
| **Conformity with standards** | EN 45545-2, HL3: 2013 + A1:2015; EN 50155: 2008; EN 61373, Cat. 1B: 2010; CE |
| **Approval** | EAC |
| **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<br>The SELV property (reinforced insulation) is not lost when voltages of up to 110 VDC are passed through the alarm relay. |



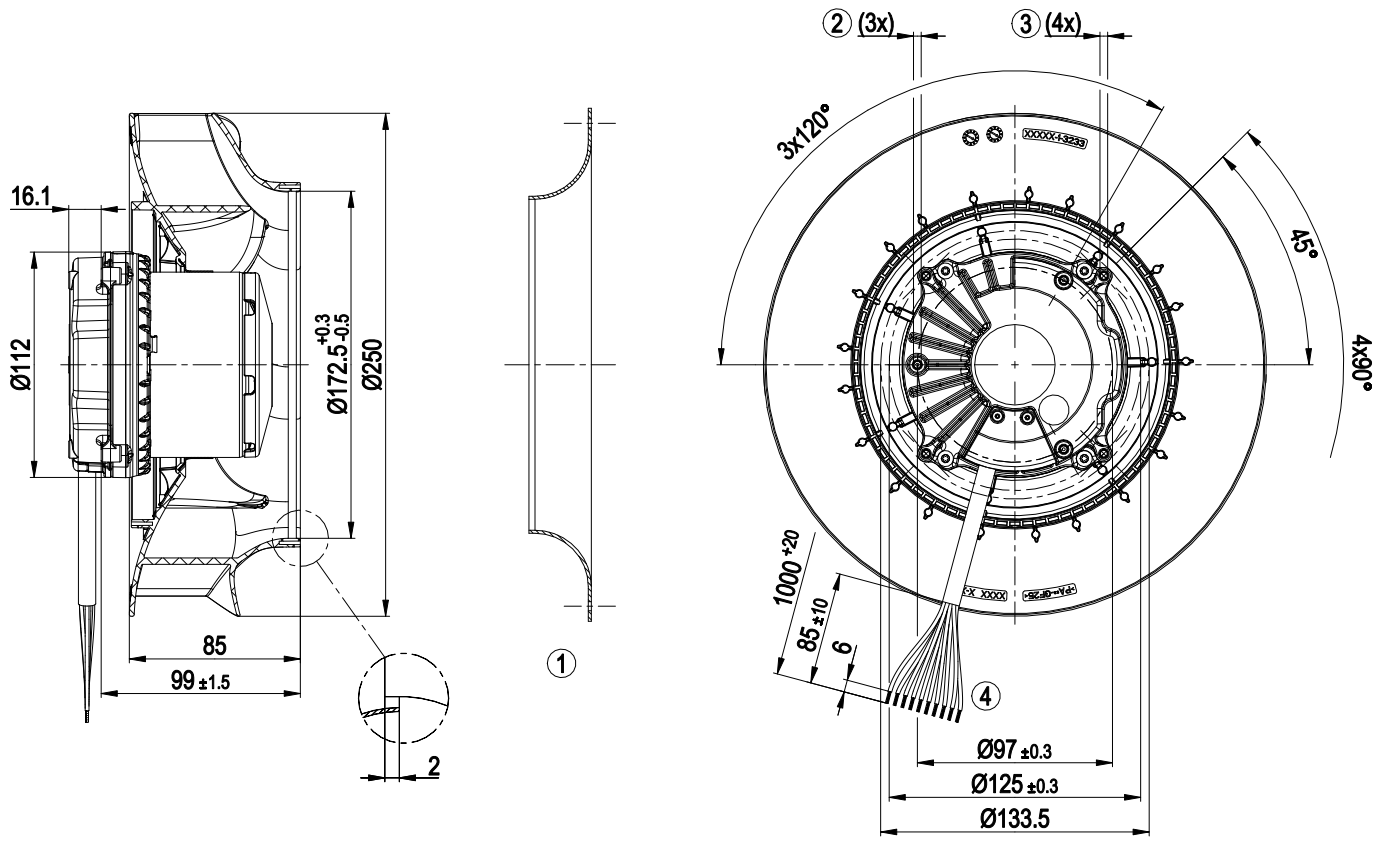
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## Product drawing




| | |
|---|---|
| 1 | Accessory part: inlet ring 96359-2-4013 not included in scope of delivery |
| 2 | Tapping hole prepared for self-tapping M4 screw, max. clearance for screw 8 mm |
| 3 | Tapping hole prepared for self-tapping M4 screw, max. clearance for screw 10 mm |
| 4 | Cable, halogen-free, railway application EN 45545, 10G 1.0 mm² |
| | 10x lead tip |



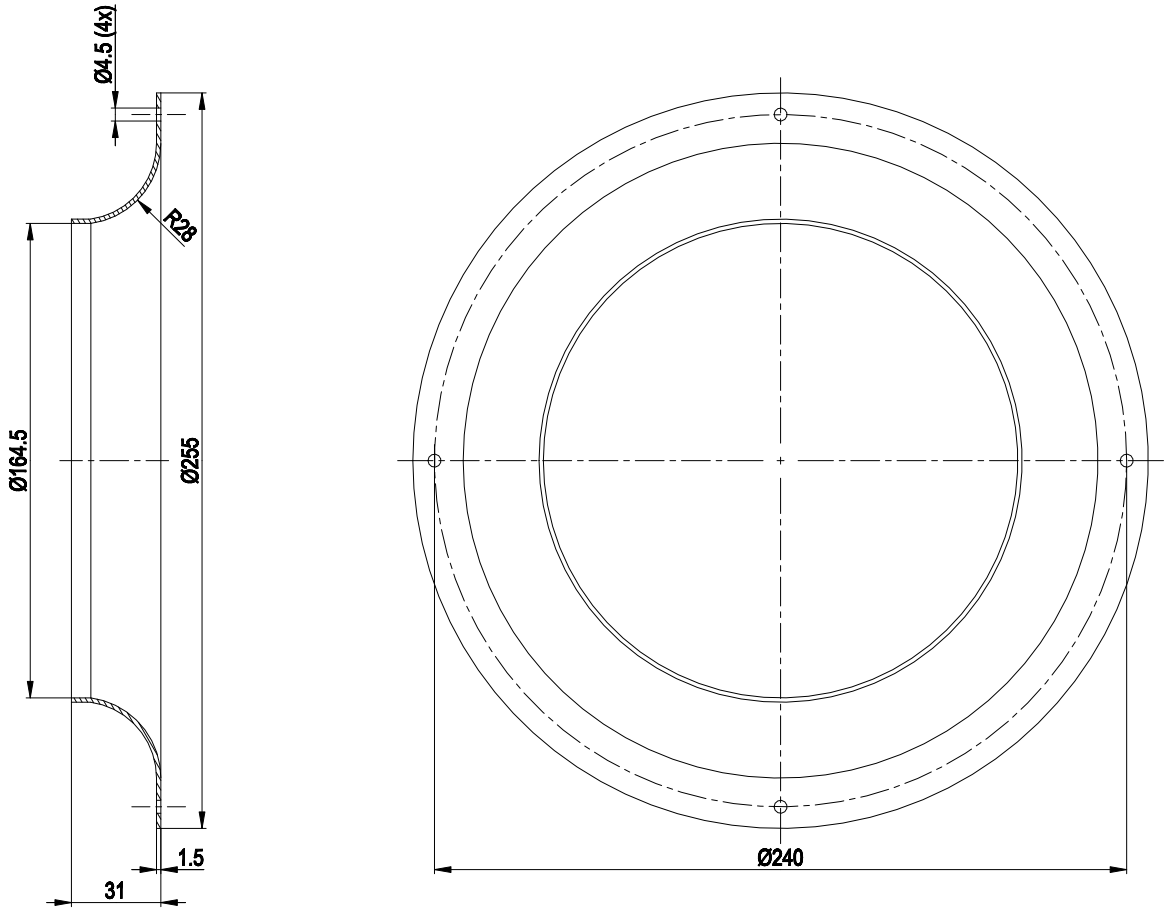
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## Accessory part




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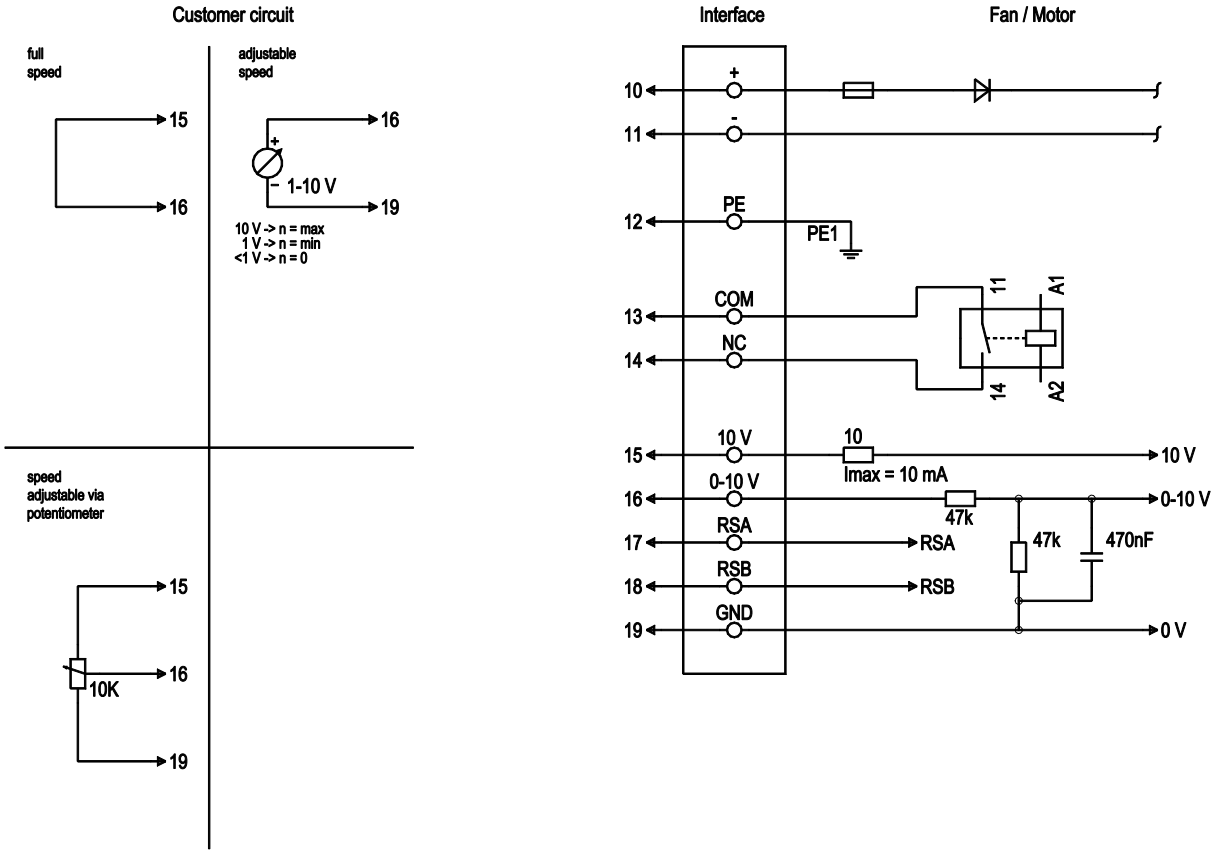
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## Connection diagram




| No. | Conn. | Designation | Color | Function/assignment |
|---|---|---|---|---|
| | 10 | + | brown | Power supply, see nameplate for voltage range |
| | 11 | - | black | Power supply, see nameplate for voltage range |
| | 12 | PE | green/yellow | Protective earth |
| | 13 | COM | gray | Status relay, floating status contact, common connection,<br>contact rating 250 VAC/2 A (AC1)/min. 10 mA/5 V;<br>Reinforced insulation in accordance with EN 50124-1 for switching voltages up to 110 VDC |
| | 14 | NC | purple | Status relay, floating status contact, break for failure,<br>contact rating 250 VAC/2 A (AC1)/min. 10 mA/5 V;<br>Reinforced insulation in accordance with EN 50124-1 for switching voltages up to 110 VDC |
| | 15 | +10 V | red | Fixed voltage output 10 VDC, SELV, +10 V +/-3%, max. 10 mA, short-circuit-proof, power supply for external devices (e.g. potentiometers) |
| | 16 | 0-10 V | yellow | Analog input (set value) SELV, 0-10 V, Ri = 100 kΩ, adjustable curve |
| | 17 | RSA | white | RS-485 interface for MODBUS, RSA; SELV |
| | 18 | RSB | orange | RS-485 interface for MODBUS, RSB; SELV |
| | 19 | GND | blue | Reference ground for control interface, SELV |



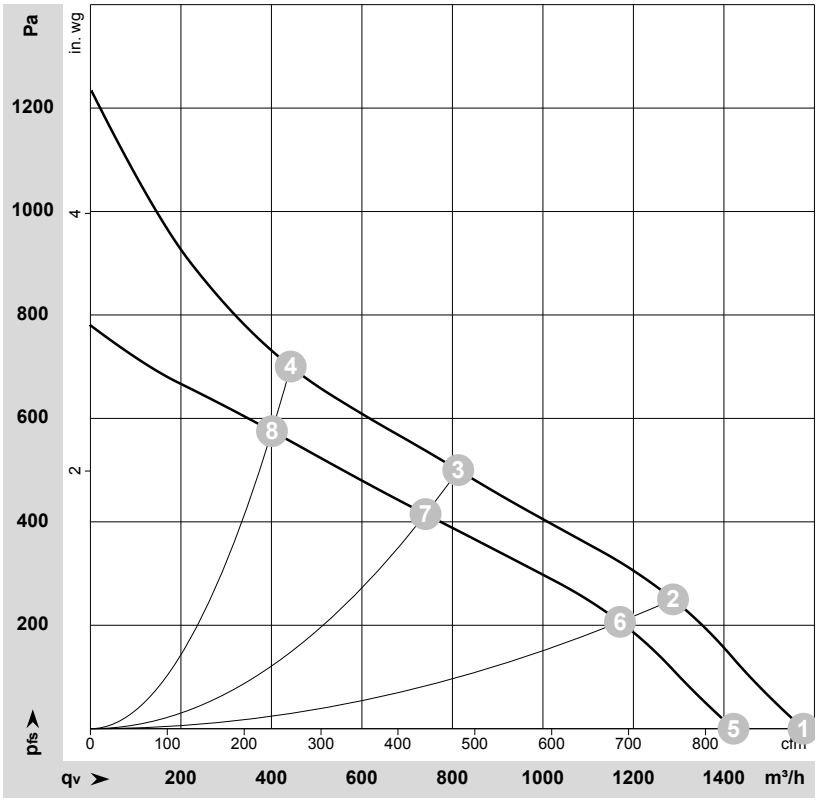
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## Curves: Air performance




ρ = 1.15 kg/m³ ± 2 %

Measurement: LU-201168-1
Measurement: LU-201186-1

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 | n | $P_{ed}$ | I | $LpA_{in}$ | $LwA_{in}$ | $q_V$ | $p_{fs}$ | $q_V$ | $p_{fs}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | V | $min^{-1}$ | W | A | dB(A) | dB(A) | $m^3/h$ | Pa | cfm | in. wg |
| 1 | 110-138 | 3150 | 250 | 2.30* | 73 | 81 | 1575 | 0 | 930 | 0.00 |
| 2 | 110-138 | 3010 | 250 | 2.30* | 69 | 76 | 1290 | 250 | 760 | 1.00 |
| 3 | 110-138 | 2950 | 250 | 2.30* | 64 | 73 | 815 | 500 | 480 | 2.01 |
| 4 | 110-138 | 3105 | 250 | 2.30* | 69 | 78 | 445 | 700 | 260 | 2.81 |
| 5 | 77 | 2865 | 182 | 2.37 | | | 1420 | 0 | 835 | 0.00 |
| 6 | 77 | 2750 | 184 | 2.39 | | | 1170 | 207 | 690 | 0.83 |
| 7 | 77 | 2660 | 184 | 2.40 | | | 740 | 415 | 435 | 1.67 |
| 8 | 77 | 2830 | 183 | 2.37 | | | 400 | 576 | 235 | 2.31 |

U = Voltage · n = Speed (rpm) · $P_{ed}$ = Power consumption · I = Current draw · * = Current measured at nominal voltage · $LpA_{in}$ = Sound pressure level intake side · $LwA_{in}$ = Sound power level intake side
$q_V$ = Air flow · $p_{fs}$ = Pressure increase



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