

# EC centrifugal module - RadiCal

backward-curved, single-intake  
with support bracket, for rail applications

K3G250-RR04-N6 ebmpapst Datasheet  
sales@fansco.com  
www.fansco.com

## Nominal data

|                          |                   |            |
|--------------------------|-------------------|------------|
| Type                     | K3G250-RR04-N6    |            |
| Motor                    | M3G084-DF         |            |
| Phase                    |                   | 3~         |
| Nominal voltage          | VAC               | 480        |
| Nominal voltage range    | VAC               | 400 .. 510 |
| Frequency                | Hz                | 50/60      |
| Method of obtaining data |                   | ml         |
| Speed (rpm)              | min <sup>-1</sup> | 4000       |
| Power consumption        | W                 | 615        |
| Current draw             | A                 | 0.85       |
| 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                                                                     | 10.2 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Fan size                                                                   | 250 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Rotor surface                                                              | Painted black                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Electronics housing material                                               | Die-cast aluminum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Impeller material                                                          | PA plastic UL94 V0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Support plate material                                                     | Sheet steel, galvanized and painted black                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Support bracket material                                                   | Steel, painted black                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Inlet nozzle material                                                      | Sheet steel, galvanized                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 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                                                      | Rotor on top                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Condensation drainage holes                                                | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Mode                                                                       | S1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Motor bearing                                                              | Ball bearing; (sealed)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Technical features                                                         | <ul style="list-style-type: none"> <li>- Output 10 VDC, max. 10 mA</li> <li>- Alarm relay</li> <li>- Integrated PID controller</li> <li>- Run monitoring</li> <li>- Power limiter</li> <li>- Motor current limitation</li> <li>- Emergency operation</li> <li>- PFC, passive</li> <li>- RS-485 MODBUS-RTU</li> <li>- Soft start</li> <li>- EEPROM write cycles: 100,000 maximum</li> <li>- Control input 0-10 VDC / PWM</li> <li>- Control interface with SELV potential safely disconnected from the mains</li> <li>- Overvoltage detection</li> <li>- Thermal overload protection for electronics/motor</li> <li>- Line undervoltage / phase failure detection</li> </ul> |
| EMC regulations                                                            | According to EN 50121-3-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Touch current according to IEC 60990 (measuring circuit Fig. 4, TN system) | <= 3.5 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Motor protection                                                           | Thermal overload protector (TOP) internally connected                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| With cable                                                                 | Lateral                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Protection class                                                           | I (with customer connection of protective earth)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Conformity with standards                                                  | EN 15085-1, CPC3: 2007; EN 45545-2, HL3: 2013; EN 50155: 2008; EN 61373, Cat. 1B: 2010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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**Comment**

Prerequisite for operation is a Class 1 vehicle electrical system architecture according to EN 50533. If voltage (e.g. 230 VAC) is passed through the alarm relay, the SELV signal wires lose their property of reinforced insulation, meaning they then have only basic insulation.

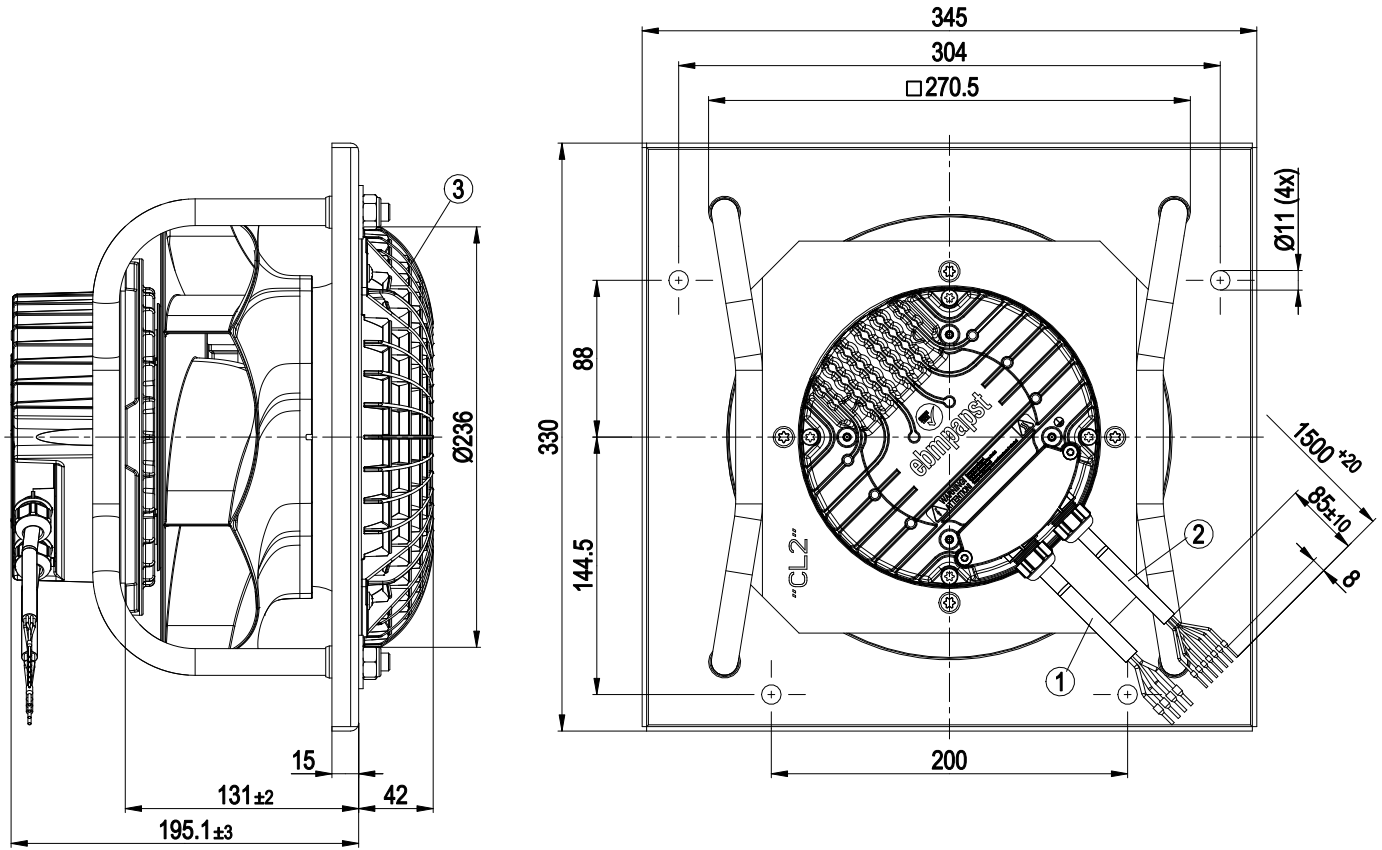
The SELV property (reinforced insulation) is not lost when voltages of up to 110 VDC are passed through the alarm relay.



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## Product drawing

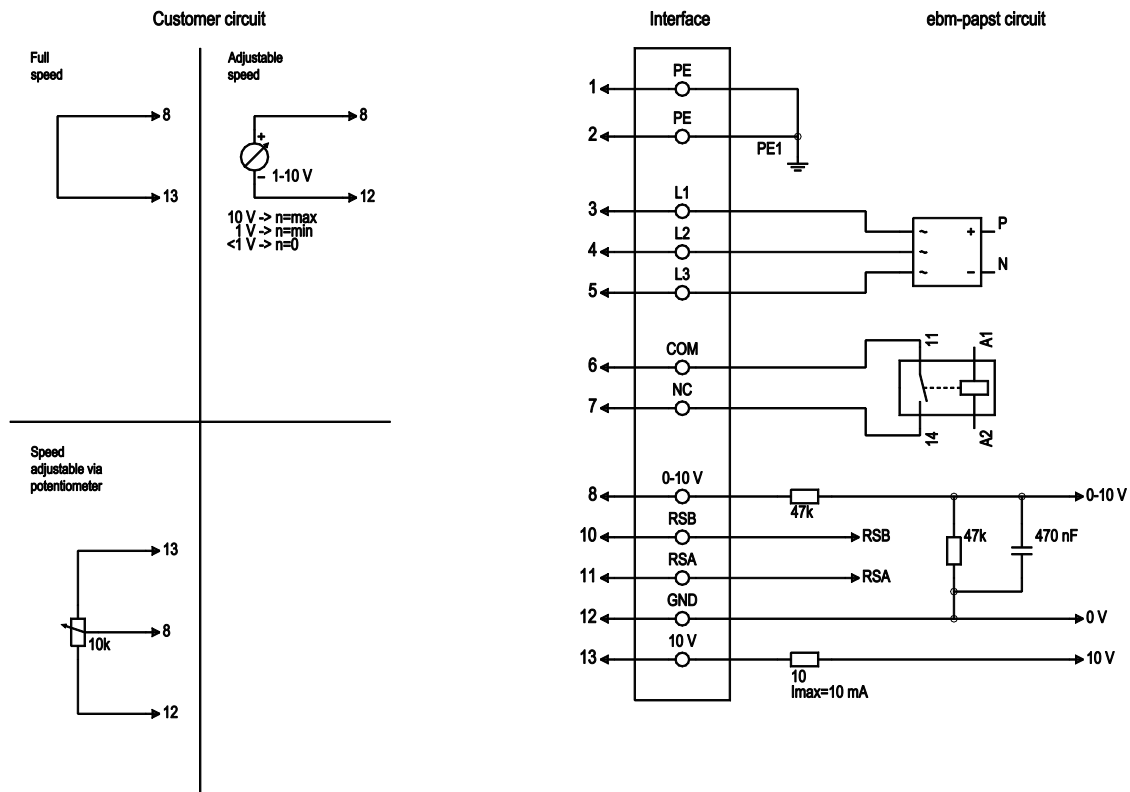


|   |                                                                                        |
|---|----------------------------------------------------------------------------------------|
| 1 | Cable halogen-free, BETAtans® 3 GKW flex, 4G 1.5 mm <sup>2</sup> , 4x crimped ferrules |
| 2 | Cable halogen-free, BETAtans® 3 GKW flex, 7x 0.5 mm <sup>2</sup> , 7x crimped ferrules |
| 3 | FlowGrid                                                                               |

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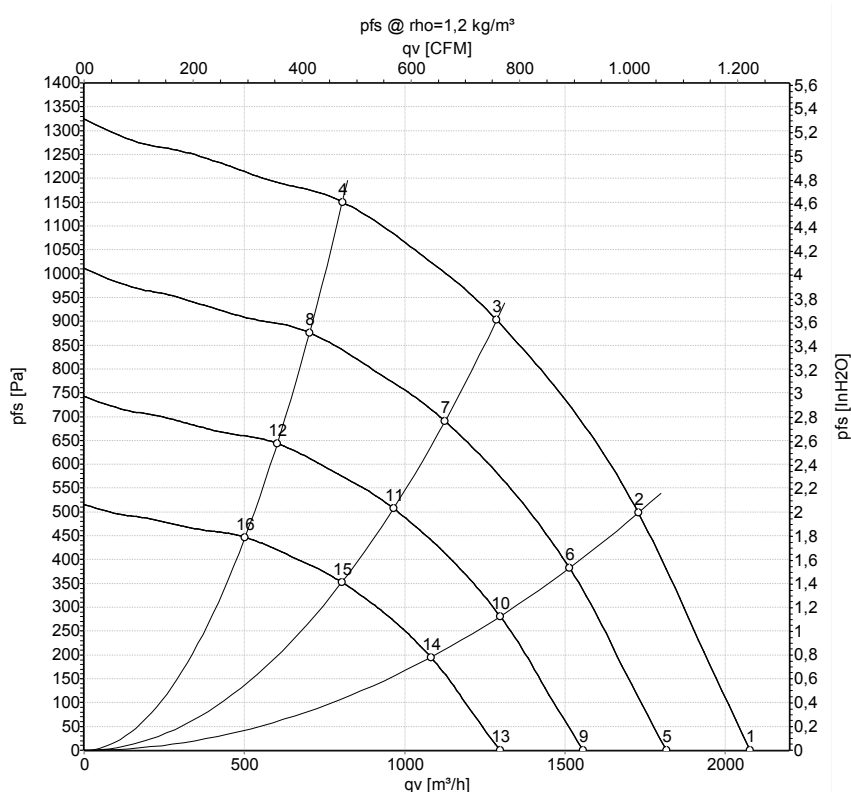
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## Connection diagram



| No. | Conn. | Designation | Color        | Function/assignment                                                                                                                                                                                                     |
|-----|-------|-------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 1, 2  | PE          | green/yellow | Protective earth                                                                                                                                                                                                        |
| 1   | 3     | L1          | black        | Power supply, phase, 50/60 Hz                                                                                                                                                                                           |
| 1   | 4     | L2          | blue         | Power supply, phase, 50/60 Hz                                                                                                                                                                                           |
| 1   | 5     | L3          | brown        | Power supply, phase, 50/60 Hz                                                                                                                                                                                           |
| 2   | 6     | COM         | gray         | Status relay, floating status contact, common connection, contact rating 250 VAC / 30 VDC 5 A minimum contact separation 1 mA / 5 VDC, reinforced insulation on supply side, basic insulation on control interface side |
| 2   | 7     | NC          | orange       | Status relay, floating status contact, break for failure, contact rating 250 VAC / 30 VDC 5 A minimum contact separation 1 mA / 5 VDC, reinforced insulation on supply side, basic insulation on control interface side |
| 2   | 8     | 0-10V       | yellow       | Analog input (set value) SELV, 0-10 V, $R_i = 100\text{ k}\Omega$ , adjustable curve                                                                                                                                    |
| 2   | 10    | RSB         | brown        | RS485 interface for MODBUS, RSB; SELV                                                                                                                                                                                   |
| 2   | 11    | RSA         | white        | RS485 interface for MODBUS, RSA; SELV                                                                                                                                                                                   |
| 2   | 12    | GND         | blue         | Reference ground for control interface, SELV                                                                                                                                                                            |
| 2   | 13    | +10V        | red          | Fixed voltage output 10 VDC, $+10\text{ V} \pm 3\%$ , max. 10 mA, short-circuit-proof, power supply for external devices (e.g. pot); SELV                                                                               |

## Curves: Air performance 60 Hz



Measurement: LU-158298-1

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 <sub>ed</sub> | I    | LpA <sub>in</sub> | LwA <sub>in</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)             | m³/h           | Pa              | cfm            | inH <sub>2</sub> O |
| 1  | 480 | 60 | 4000              | 484             | 0.70 | 79                | 87                | 2080           | 0               | 1225           | 0.00               |
| 2  | 480 | 60 | 4000              | 562             | 0.79 | 76                | 84                | 1730           | 500             | 1020           | 2.01               |
| 3  | 480 | 60 | 4000              | 615             | 0.85 | 74                | 82                | 1285           | 900             | 755            | 3.61               |
| 4  | 480 | 60 | 4000              | 552             | 0.78 | 78                | 85                | 805            | 1150            | 475            | 4.62               |
| 5  | 480 | 60 | 3500              | 323             | 0.47 | 76                | 84                | 1815           | 0               | 1070           | 0.00               |
| 6  | 480 | 60 | 3500              | 377             | 0.53 | 73                | 80                | 1515           | 382             | 890            | 1.53               |
| 7  | 480 | 60 | 3500              | 407             | 0.57 | 71                | 79                | 1125           | 690             | 665            | 2.77               |
| 8  | 480 | 60 | 3500              | 367             | 0.52 | 75                | 82                | 705            | 876             | 415            | 3.52               |
| 9  | 480 | 60 | 3000              | 203             | 0.30 | 72                | 80                | 1555           | 0               | 915            | 0.00               |
| 10 | 480 | 60 | 3000              | 238             | 0.33 | 69                | 77                | 1300           | 281             | 765            | 1.13               |
| 11 | 480 | 60 | 3000              | 257             | 0.36 | 67                | 75                | 965            | 507             | 570            | 2.04               |
| 12 | 480 | 60 | 3000              | 231             | 0.33 | 71                | 78                | 605            | 644             | 355            | 2.59               |
| 13 | 480 | 60 | 2500              | 118             | 0.17 | 68                | 75                | 1295           | 0               | 765            | 0.00               |
| 14 | 480 | 60 | 2500              | 138             | 0.19 | 64                | 72                | 1080           | 195             | 635            | 0.78               |
| 15 | 480 | 60 | 2500              | 148             | 0.21 | 63                | 70                | 805            | 352             | 475            | 1.41               |
| 16 | 480 | 60 | 2500              | 134             | 0.19 | 66                | 74                | 500            | 447             | 295            | 1.79               |

U = Power supply · 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  
q<sub>v</sub> = Air flow · p<sub>fs</sub> = Pressure increase