

# EC centrifugal module - RadiPac

backward-curved, single-intake

with support bracket

**ebm-papst Mulfingen GmbH & Co. KG**

Bachmühle 2 · D-74673 Mulfingen

Phone +49 7938 81-0

Fax +49 7938 81-110

info1@de.ebmpapst.com

www.ebmpapst.com

Limited partnership · Headquarters Mulfingen

Amtsgericht (court of registration) Stuttgart · HRA 590344

General partner Elektrobau Mulfingen GmbH · Headquarters Mulfingen

Amtsgericht (court of registration) Stuttgart · HRB 590142

## Nominal data

|                          |                   |            |
|--------------------------|-------------------|------------|
| Type                     | K3G310-PH58-07    |            |
| Motor                    | M3G112-GA         |            |
| 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> | 4000       |
| Power consumption        | W                 | 2950       |
| Current draw             | A                 | 4.6        |
| Min. ambient temperature | °C                | -25        |
| 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 (EN 17166)

|                                   |   | Actual | Req. 2015 |
|-----------------------------------|---|--------|-----------|
| 01 Overall efficiency $\eta_{es}$ | % | 66.1   | 56.4      |
| 02 Measurement category           |   | A      |           |
| 03 Efficiency category            |   | Static |           |
| 04 Efficiency grade N             |   | 71.7   | 62        |
| 05 Variable speed drive           |   | Yes    |           |

Data obtained at optimum efficiency level.

The ErP data is determined using a motor-impeller combination in a standardized measurement setup.

|                               |                   |      |
|-------------------------------|-------------------|------|
| 09 Power consumption $P_{ed}$ | kW                | 2.93 |
| 09 Air flow $q_v$             | m <sup>3</sup> /h | 4505 |
| 09 Pressure increase $p_{fs}$ | Pa                | 1479 |
| 10 Speed (rpm) n              | min <sup>-1</sup> | 4045 |
| 11 Specific ratio*            |                   | 1.02 |

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

LU-176710



## Technical description

|                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Weight                                                                     | 23 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Size                                                                       | 310 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Motor size                                                                 | 112                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Rotor surface                                                              | Painted black                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Electronics housing material                                               | Die-cast aluminum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Impeller material                                                          | Sheet aluminum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Support plate material                                                     | Sheet steel, galvanized                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Support bracket material                                                   | Steel, painted black                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Inlet nozzle material                                                      | Sheet steel, galvanized                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Number of blades                                                           | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Direction of rotation                                                      | Clockwise, viewed toward rotor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Degree of protection                                                       | IP54                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Insulation class                                                           | "B"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Moisture (F) / Environmental (H) protection class                          | H1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Ambient temperature note                                                   | Occasional start-up between -40°C and -25°C is permissible.<br>For continuous operation at temperatures below -25°C (e.g. refrigeration applications) we recommend our 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                                                      | See product drawing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Condensation drainage holes                                                | On rotor side                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Mode                                                                       | S1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Motor bearing                                                              | Ball bearing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Technical features                                                         | <ul style="list-style-type: none"> <li>- Output 10 VDC, max. 10 mA</li> <li>- Output 20 VDC, max. 50 mA</li> <li>- Output for slave 0-10 V</li> <li>- Operation and alarm display</li> <li>- Input for sensor 0-10 V or 4-20 mA</li> <li>- External 24 V input (parameter setting)</li> <li>- External release input</li> <li>- Alarm relay</li> <li>- Integrated PID controller</li> <li>- Power limiter</li> <li>- Motor current limitation</li> <li>- PFC, passive</li> <li>- RS-485 MODBUS-RTU</li> <li>- Soft start</li> <li>- Control input 0-10 VDC / PWM</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> |
| Touch current according to IEC 60990 (measuring circuit Fig. 4, TN system) | <= 3.5 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Electrical hookup                                                          | Terminal box                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Motor protection                                                           | Thermal overload protector (TOP) internally connected                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Protection class                                                           | I (with customer connection of protective earth)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

K3G310-PH58-07

## EC centrifugal module - RadiPac

backward-curved, single-intake

with support bracket

|                           |                                                               |
|---------------------------|---------------------------------------------------------------|
| Conformity with standards | EN 61800-5-1; CE                                              |
| Approval                  | CSA C22.2 No. 77 + CAN/CSA-E60730-1; EAC; UL 1004-7 + 60730-1 |

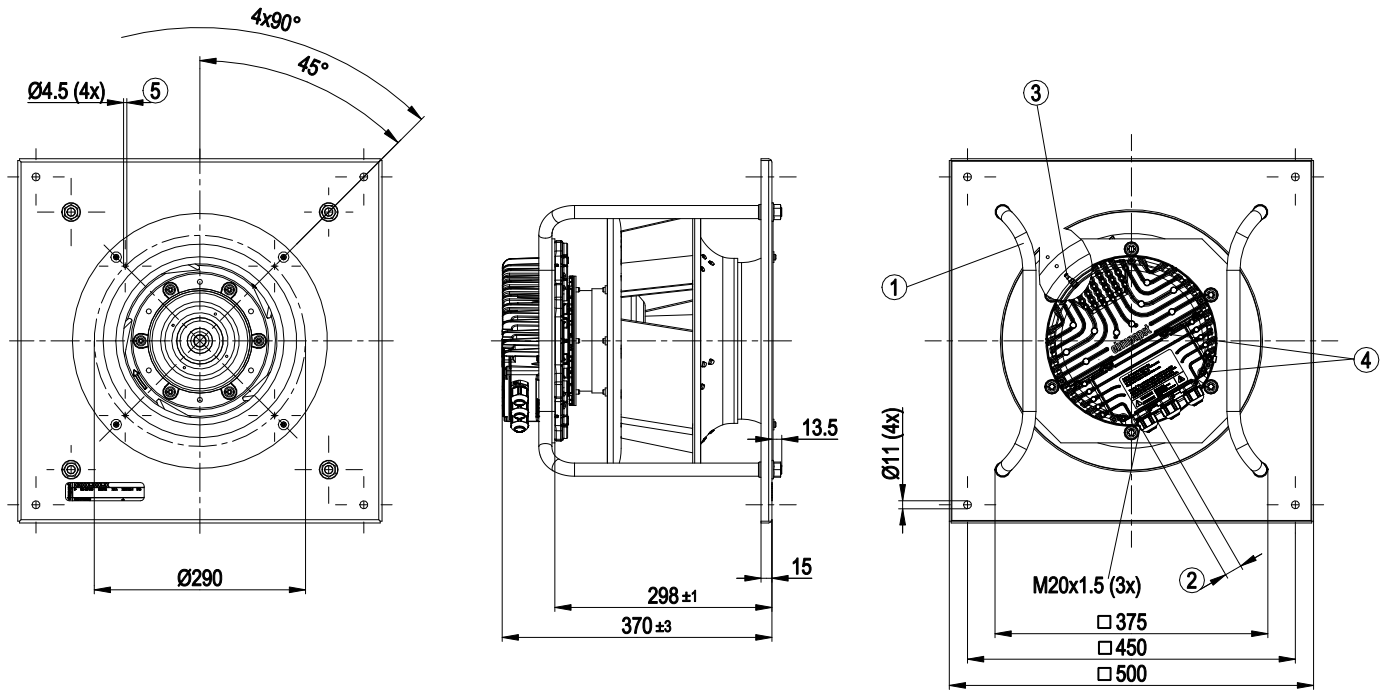


# EC centrifugal module - RadiPac

backward-curved, single-intake

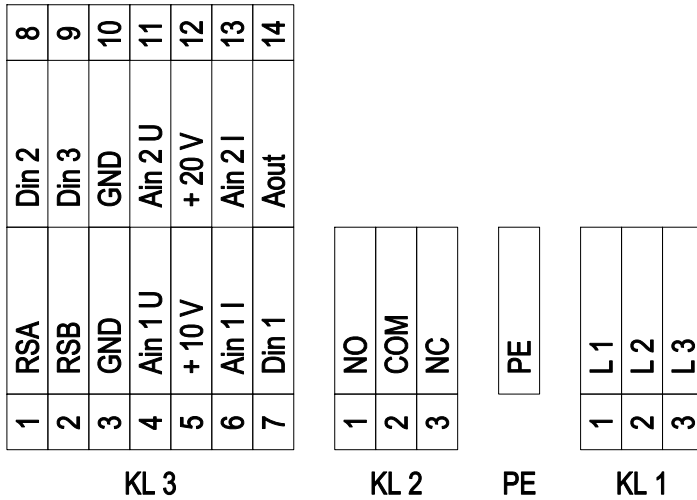
with support bracket

## Product drawing



|   |                                                                                                                                          |
|---|------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Installed position: shaft horizontal (install support struts only vertically as illustrated) or rotor on bottom; rotor on top on request |
| 2 | Cable diameter min. 4 mm, max. 10 mm, tightening torque $4 \pm 0.6$ Nm                                                                   |
| 3 | Inlet ring with pressure tap (k-factor: 116)                                                                                             |
| 4 | Tightening torque $3.5 \pm 0.5$ Nm                                                                                                       |
| 5 | Mounting holes for FlowGrid                                                                                                              |

## Connection diagram



| No.  | Conn.  | Designation | Function/assignment                                                                                                                                                                                                                                                                        |
|------|--------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KL 1 | 1      | L1          | Supply connection, power supply 3-phase 380-480 VAC, 50/60 Hz                                                                                                                                                                                                                              |
| KL 1 | 2      | L2          | Supply connection, power supply 3-phase 380-480 VAC, 50/60 Hz                                                                                                                                                                                                                              |
| KL 1 | 3      | L3          | Supply connection, power supply 3-phase 380-480 VAC, 50/60 Hz                                                                                                                                                                                                                              |
| PE   |        | PE          | Ground connection, PE connection                                                                                                                                                                                                                                                           |
| KL 2 | 1      | NO          | Status relay, floating status contact; make for failure                                                                                                                                                                                                                                    |
| KL2  | 2      | COM         | Status relay, floating status contact; changeover contact; common connection; contact rating 250 VAC / max. 2 A (AC1) / min. 10 mA                                                                                                                                                         |
| KL2  | 3      | NC          | Status relay, floating status contact; break for failure                                                                                                                                                                                                                                   |
| KL 3 | 1      | RSA         | Bus connection RS485, RSA, MODBUS-RTU; SELV                                                                                                                                                                                                                                                |
| KL 3 | 2      | RSB         | Bus connection RS485, RSB, MODBUS-RTU; SELV                                                                                                                                                                                                                                                |
| KL 3 | 3 / 10 | GND         | Reference ground for control interface; SELV                                                                                                                                                                                                                                               |
| KL 3 | 4      | Ain1 U      | Analog input 1, set value: 0-10 V, Ri = 100 kΩ, adjustable curve, only usable as alternative to input Ain1 I; SELV                                                                                                                                                                         |
| KL 3 | 5      | + 10 V      | Fixed voltage output 10 VDC, +10 V ±3%, max. 10 mA, short-circuit-proof power supply for external devices (e.g. pot); SELV                                                                                                                                                                 |
| KL 3 | 6      | Ain1 I      | Analog input 1, set value: 4-20 mA, Ri = 100 Ω, adjustable curve, only usable as alternative to input Ain1U; SELV                                                                                                                                                                          |
| KL 3 | 7      | Din1        | Digital input 1: enable electronics,<br>enable: pin open or applied voltage 5-50 VDC<br>disable: bridge to GND or applied voltage < 1 VDC<br>reset function: triggers software reset after a level change to < 1 VDC; SELV                                                                 |
| KL 3 | 8      | Din2        | Digital input 2: Switching parameter sets 1/2, according to EEPROM setting, the valid or used parameter set can be selected via bus or via digital input DIN2.<br>Parameter set 1: pin open or applied voltage 5-50 VDC<br>Parameter set 2: bridge to GND or applied voltage < 1 VDC; SELV |
| KL 3 | 9      | Din3        | Digital input 3: according to EEPROM setting, the integrated controller's direction of action can be selected as normal/inverse via bus or digital input<br>normal: pin open or applied voltage 5-50 VDC<br>inverse: bridge to GND or applied voltage < 1 VDC; SELV                        |
| KL 3 | 11     | Ain2 U      | Analog input 2, measured value: 0-10 V, Ri = 100 kΩ, adjustable curve, only usable as alternative to input Ain2I; SELV                                                                                                                                                                     |
| KL 3 | 12     | + 20 V      | Fixed voltage output 20 VDC, +20 V ±25/-10%, max. 50 mA, short-circuit-proof power supply for external devices (e.g. sensors); SELV                                                                                                                                                        |

# EC centrifugal module - RadiPac

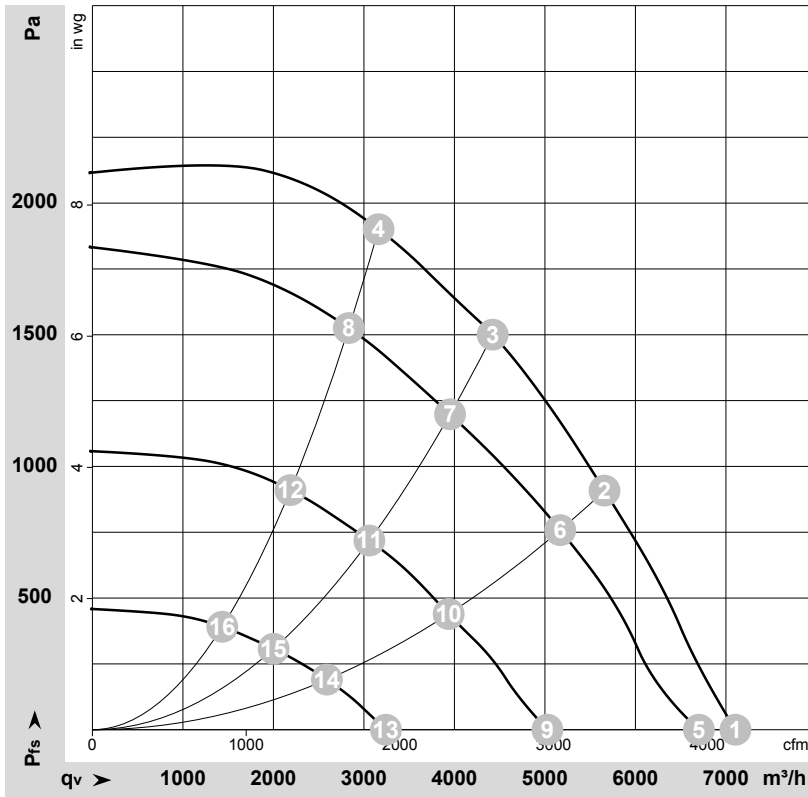
backward-curved, single-intake

with support bracket

| No.  | Conn. | Designation | Function/assignment                                                                                                            |
|------|-------|-------------|--------------------------------------------------------------------------------------------------------------------------------|
| KL 3 | 13    | Ain2 I      | Analog input 2, measured value: 4-20 mA, Ri = 100 $\Omega$ , adjustable curve, only usable as alternative to input Ain2U; SELV |
| KL 3 | 14    | Aout        | Analog output 0-10 VDC, max. 5 mA, output of current motor modulation level / motor speed adjustable curve; SELV               |



## Curves: Air performance 50 Hz



$$\rho = 1.177 \text{ kg/m}^3 \pm 2 \%$$

Measurement: LU-176710-1

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> | 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  | 400 | 50 | 4000              | 1707            | 2.66 | 95                | 102               | 102                | 7105              | 0               | 4180           | 0.00            |
| 2  | 400 | 50 | 4000              | 2611            | 4.03 | 85                | 92                | 95                 | 5660              | 900             | 3330           | 3.61            |
| 3  | 400 | 50 | 4000              | 2943            | 4.53 | 82                | 89                | 93                 | 4425              | 1500            | 2605           | 6.02            |
| 4  | 400 | 50 | 4000              | 2950            | 4.60 | 84                | 92                | 94                 | 3160              | 1900            | 1860           | 7.63            |
| 5  | 400 | 50 | 3795              | 1414            | 2.22 | 94                | 100               | 100                | 6700              | 0               | 3945           | 0.00            |
| 6  | 400 | 50 | 3655              | 1998            | 3.09 | 83                | 89                | 92                 | 5170              | 762             | 3040           | 3.06            |
| 7  | 400 | 50 | 3585              | 2078            | 3.21 | 79                | 86                | 91                 | 3950              | 1198            | 2325           | 4.81            |
| 8  | 400 | 50 | 3610              | 2103            | 3.24 | 79                | 88                | 91                 | 2835              | 1529            | 1665           | 6.14            |
| 9  | 400 | 50 | 2865              | 671             | 1.18 | 84                | 92                | 94                 | 5025              | 0               | 2960           | 0.00            |
| 10 | 400 | 50 | 2810              | 957             | 1.57 | 75                | 82                | 86                 | 3935              | 438             | 2315           | 1.76            |
| 11 | 400 | 50 | 2795              | 1019            | 1.66 | 72                | 80                | 84                 | 3060              | 719             | 1800           | 2.89            |
| 12 | 400 | 50 | 2790              | 1028            | 1.67 | 73                | 80                | 85                 | 2190              | 912             | 1290           | 3.66            |
| 13 | 400 | 50 | 1880              | 244             | 0.52 | 72                | 82                | 82                 | 3245              | 0               | 1910           | 0.00            |
| 14 | 400 | 50 | 1840              | 320             | 0.65 | 63                | 72                | 76                 | 2590              | 191             | 1525           | 0.77            |
| 15 | 400 | 50 | 1830              | 340             | 0.68 | 62                | 70                | 75                 | 2000              | 308             | 1180           | 1.24            |
| 16 | 400 | 50 | 1830              | 343             | 0.68 | 63                | 70                | 75                 | 1435              | 392             | 845            | 1.57            |

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

