

R3G450-RK56-01

# EC centrifugal fan - RadiCal

backward-curved, single-intake

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## Nominal data

|       |                |  |
|-------|----------------|--|
| Type  | R3G450-RK56-01 |  |
| 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> | 1550 |
| Power consumption        | W                 | 950  |
| Current draw             | A                 | 1.5  |
| 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 (prEN 17166)

|                                   |   | Actual | Req. 2015 |                               |                   |      |
|-----------------------------------|---|--------|-----------|-------------------------------|-------------------|------|
| 01 Overall efficiency $\eta_{es}$ | % | 64.7   | 51.2      | 09 Power consumption $P_{ed}$ | kW                | 0.94 |
| 02 Measurement category           |   | A      |           | 09 Air flow $q_v$             | m <sup>3</sup> /h | 4445 |
| 03 Efficiency category            |   | Static |           | 09 Pressure increase $p_{fs}$ | Pa                | 455  |
| 04 Efficiency grade N             |   | 75.5   | 62        | 10 Speed (rpm) n              | min <sup>-1</sup> | 1555 |
| 05 Variable speed drive           |   | Yes    |           | 11 Specific ratio*            |                   | 1.00 |

Data obtained at optimum efficiency level.

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

LU-152167

The efficiency values displayed for achieving conformity with the Ecodesign Regulation EU 327/2011 has been reached with defined air duct components (e.g. inlet rings).  
The dimensions must be requested from ebm-papst. If other air conduction geometries are used on the installation side, the ebm-papst evaluation loses its validity/the conformity must be confirmed again.  
The product does not fall within the scope of Regulation (EU) 2019/1781 due to the exception specified in Article 2 (2a) (motors completely integrated into a product).



## Technical description

|                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Weight                                                                     | 10.6 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Size                                                                       | 450 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Motor size                                                                 | 112                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Rotor surface                                                              | Painted black                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Electronics housing material                                               | Die-cast aluminum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Impeller material                                                          | PP plastic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Number of blades                                                           | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 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 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                                                      | 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"> <li>- Output 10 VDC, max. 10 mA</li> <li>- Operation and alarm display</li> <li>- External 24 V input (parameter setting)</li> <li>- Alarm relay</li> <li>- Integrated PID controller</li> <li>- Motor current limitation</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>- Thermal overload protection for electronics/motor</li> <li>- Line undervoltage / phase failure detection</li> </ul> |
| EMC immunity to interference                                               | According to EN 61000-6-2 (industrial environment)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| EMC circuit feedback                                                       | According to EN 61000-3-2/3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| EMC interference emission                                                  | According to EN 61000-6-3 (household environment)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 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                                                                 | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

R3G450-RK56-01

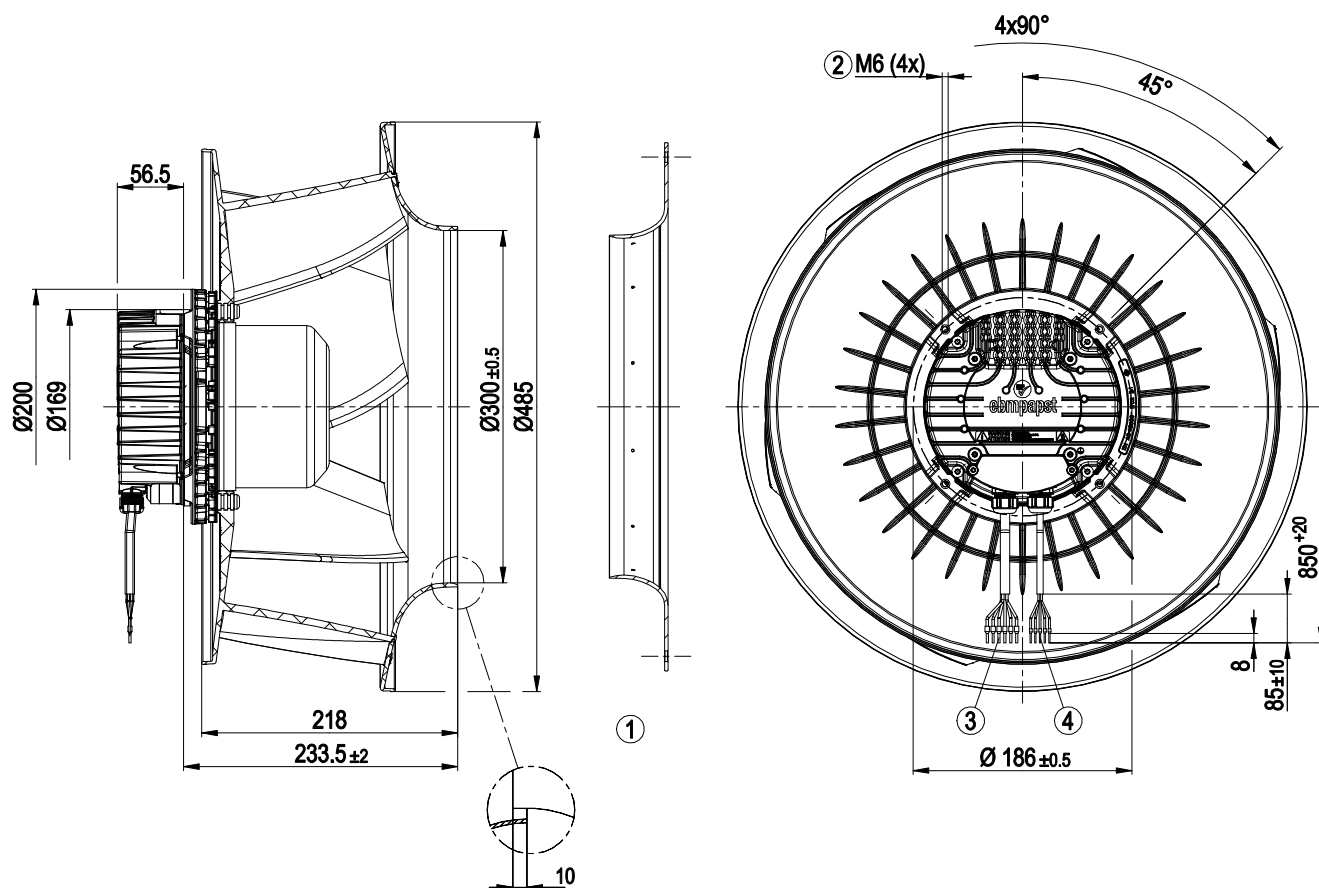
## EC centrifugal fan - RadiCal

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|                             |                                                                                                                                                                                                                                                                                                |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protection class assignment | I; If a protective earth is connected by the customer<br>This component for installation may have several local protection classes. This information relates to this component's basic design.<br>The final protection class is based on the component's intended installation and connection. |
| Conformity with standards   | EN 61800-5-1; CE; UKCA                                                                                                                                                                                                                                                                         |
| Approval                    | UL 1004-7 + 60730-1; EAC; CCC; CSA C22.2 No. 77 + CAN/CSA-E60730-1                                                                                                                                                                                                                             |

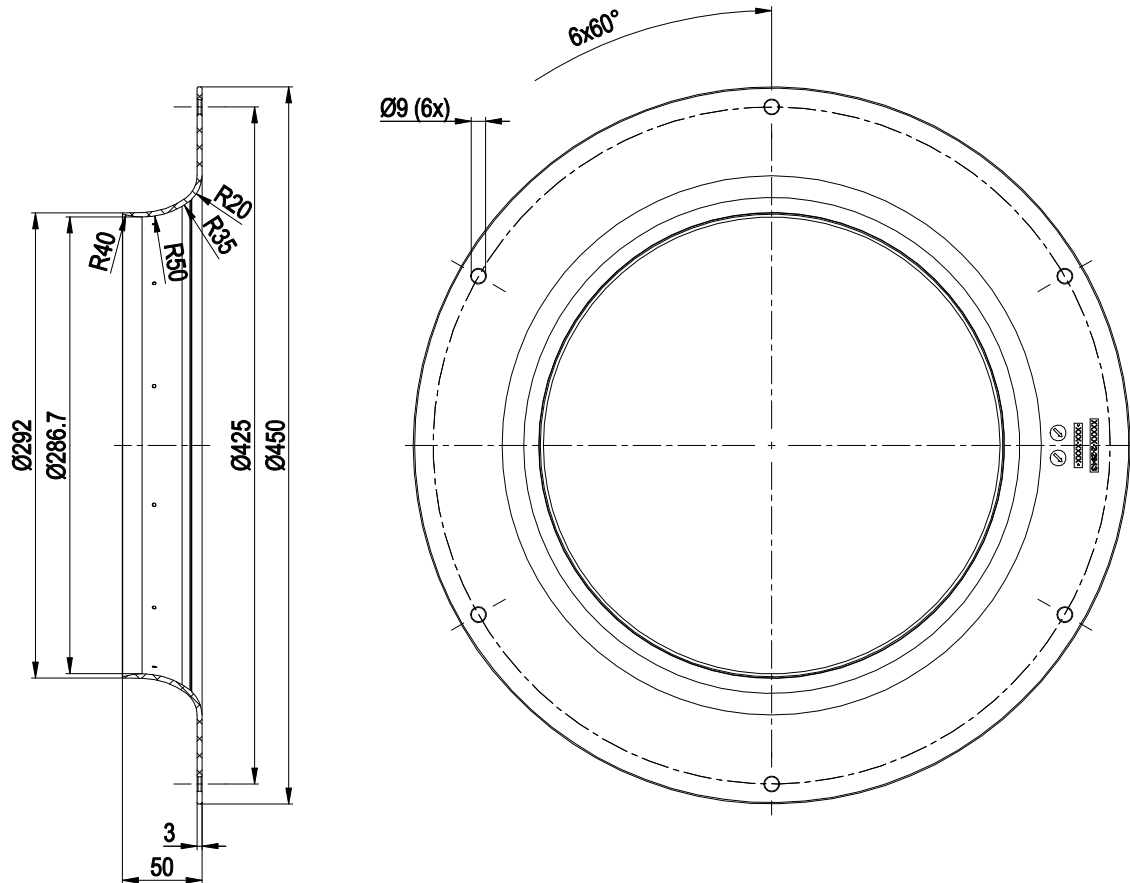


## Product drawing



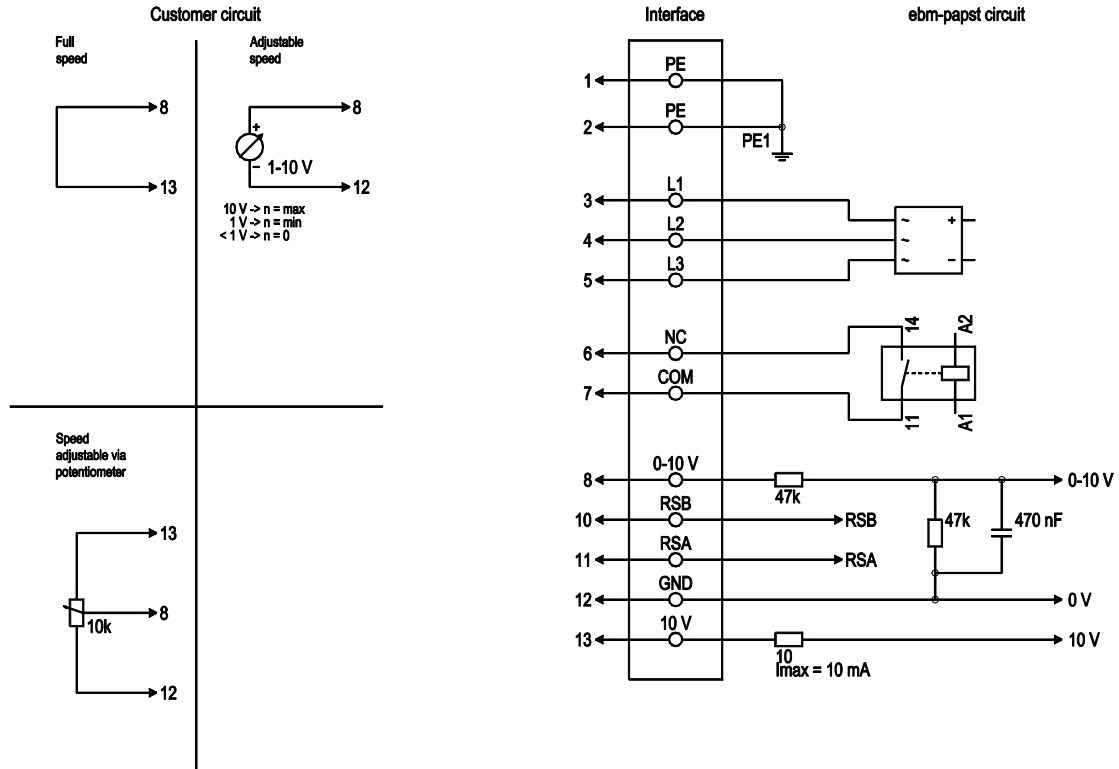
|   |                                                                           |
|---|---------------------------------------------------------------------------|
| 1 | Accessory part: inlet ring 45901-2-2943 not included in scope of delivery |
| 2 | Max. clearance for screw 16 mm                                            |
| 3 | Cable PVC AWG18<br>6x wire-end ferrule                                    |
| 4 | Cable PVC AWG22<br>5x wire-end ferrule                                    |

## Accessory part



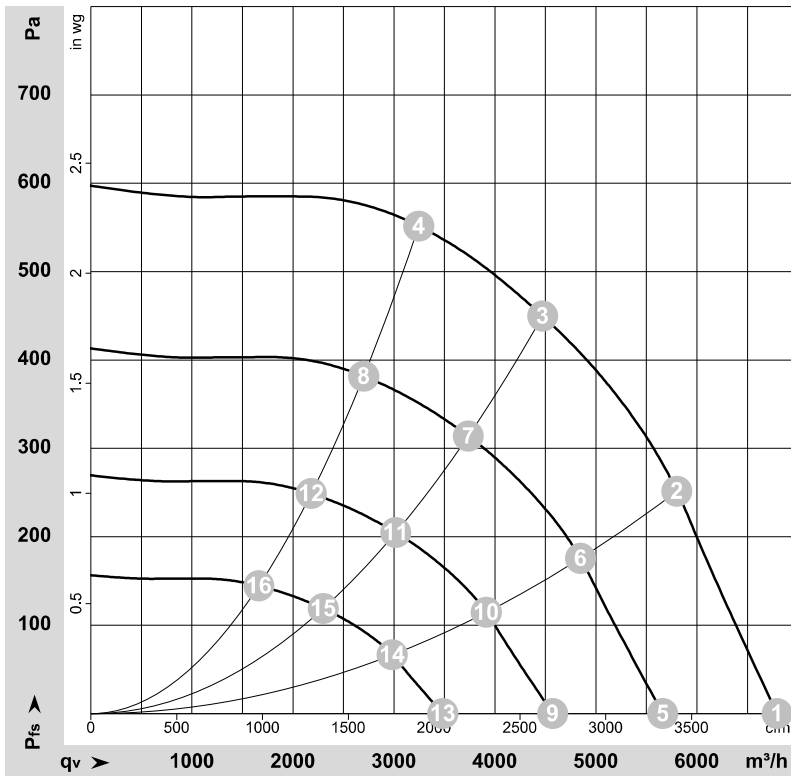
Inlet ring 45901-2-2943 not included in scope of delivery

## Connection diagram



| No. | Conn. | Designation | Color        | Function/assignment                                                                                                                                                                                                    |
|-----|-------|-------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 1, 2  | PE          | green/yellow | Protective earth                                                                                                                                                                                                       |
| 1   | 3     | L1          | black        | Power supply                                                                                                                                                                                                           |
| 1   | 4     | L2          | black        | Power supply                                                                                                                                                                                                           |
| 1   | 5     | L3          | black        | Power supply                                                                                                                                                                                                           |
| 1   | 6     | NC          | white 1      | Status relay, floating status contact, break for failure, contact rating 250 VAC / 2 A (AC1) / min. 10 mA; reinforced insulation on supply side and basic insulation on control interface side                         |
| 1   | 7     | COM         | white 2      | Status relay, floating status contact, break for failure, contact rating 250 VAC / 2 A (AC1) / min. 10 mA; reinforced insulation on supply side and basic insulation on control interface side                         |
| 2   | 8     | 0-10V       | yellow       | Analog input (set value), 0-10 V, R <sub>i</sub> = 100 kΩ, adjustable curve, SELV                                                                                                                                      |
| 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 V ±3%, max. 10 mA, short-circuit-proof power supply for external devices (e.g. pot), SELV<br>fixed voltage input 24 VDC for setting parameters via MODBUS without line voltage supply |

## Curves: Air performance 50 Hz



$$\rho = 1.15 \text{ kg/m}^3 \pm 2 \%$$

Measurement: LU-152167-1

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 | 1550              | 597             | 0.99 | 71                | 79                | 86                 | 6795              | 0               | 4000           | 0.00            |
| 2  | 400 | 50 | 1550              | 836             | 1.35 | 70                | 78                | 85                 | 5800              | 250             | 3415           | 1.00            |
| 3  | 400 | 50 | 1550              | 950             | 1.50 | 66                | 74                | 80                 | 4470              | 450             | 2630           | 1.81            |
| 4  | 400 | 50 | 1550              | 883             | 1.42 | 66                | 75                | 81                 | 3245              | 550             | 1910           | 2.21            |
| 5  | 400 | 50 | 1300              | 346             | 0.57 | 66                | 75                | 82                 | 5660              | 0               | 3330           | 0.00            |
| 6  | 400 | 50 | 1300              | 487             | 0.79 | 65                | 73                | 80                 | 4845              | 178             | 2855           | 0.71            |
| 7  | 400 | 50 | 1300              | 551             | 0.89 | 61                | 69                | 76                 | 3735              | 316             | 2200           | 1.27            |
| 8  | 400 | 50 | 1300              | 508             | 0.82 | 62                | 70                | 76                 | 2700              | 382             | 1590           | 1.53            |
| 9  | 400 | 50 | 1050              | 182             | 0.30 | 61                | 69                | 76                 | 4570              | 0               | 2690           | 0.00            |
| 10 | 400 | 50 | 1050              | 257             | 0.42 | 60                | 68                | 75                 | 3915              | 116             | 2305           | 0.47            |
| 11 | 400 | 50 | 1050              | 291             | 0.47 | 56                | 64                | 70                 | 3020              | 206             | 1775           | 0.83            |
| 12 | 400 | 50 | 1050              | 268             | 0.43 | 56                | 65                | 71                 | 2180              | 249             | 1285           | 1.00            |
| 13 | 400 | 50 | 800               | 81              | 0.13 | 54                | 63                | 69                 | 3485              | 0               | 2050           | 0.00            |
| 14 | 400 | 50 | 800               | 114             | 0.18 | 53                | 61                | 68                 | 2980              | 67              | 1755           | 0.27            |
| 15 | 400 | 50 | 800               | 129             | 0.21 | 49                | 57                | 64                 | 2300              | 120             | 1355           | 0.48            |
| 16 | 400 | 50 | 800               | 118             | 0.19 | 49                | 58                | 64                 | 1660              | 145             | 980            | 0.58            |

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

