**R4D450-FH03-01**

# AC centrifugal fan - RadiCal

backward-curved, single-intake

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## Nominal data

| | |
|---|---|
| **Type** | **R4D450-FH03-01** |
| **Motor** | **M4D110-IA** |

| | | | | | |
|---|---|---|---|---|---|
| Phase | | 3~ | 3~ | 3~ | 3~ |
| Nominal voltage | VAC | 230 | 277 | 400 | 480 |
| Wiring | | Δ | Δ | Y | Y |
| Frequency | Hz | 50 | 60 | 50 | 60 |
| Method of obtaining data | | ml | ml | ml | ml |
| Valid for approval/standard | | CE | CE | CE | CE |
| Speed (rpm) | $min^{-1}$ | 1420 | 1680 | 1420 | 1680 |
| Power consumption | W | 720 | 1190 | 720 | 1190 |
| Current draw | A | 3.3 | 3.8 | 1.9 | 2.2 |
| Min. back pressure | Pa | 0 | 0 | 0 | 0 |
| Min. back pressure | in. wg | 0 | 0 | 0 | 0 |
| Min. ambient temperature | °C | -40 | -40 | -40 | -40 |
| Max. ambient temperature | °C | 40 | 40 | 40 | 40 |
| Starting current | A | 16.5 | 19 | 9.5 | 11 |

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 $\eta_{es}$ | % | 58 | 50 |
| 02 Measurement category | | A | |
| 03 Efficiency category | | Static | |
| 04 Efficiency grade N | | 70 | 62 |
| 05 Variable speed drive | | No | |

| | | |
|---|---|---|
| 09 Power consumption $P_e$ | kW | 0.71 |
| 09 Air flow $q_v$ | $m^3/h$ | 4555 |
| 09 Pressure increase $p_{fs}$ | Pa | 331 |
| 10 Speed (rpm) n | $min^{-1}$ | 1420 |
| 11 Specific ratio* | | 1.00 |

Data obtained at optimum efficiency level.

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

LU-208311

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).

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## Technical description

| | |
|---|---|
| **Weight** | 13.2 kg |
| **Size** | 450 mm |
| **Motor size** | 110 |
| **Rotor surface** | Cast in aluminum |
| **Impeller material** | PP plastic |
| **Number of blades** | 6 |
| **Direction of rotation** | Clockwise, viewed toward rotor |
| **Degree of protection** | IP54 |
| **Insulation class** | "F" |
| **Moisture (F) / Environmental (H) protection class** | H2 |
| **Ambient temperature note** | Occasional start-up at temperatures between -40°C and -25°C is permitted. For continuous operation at ambient temperatures below -25°C (such as refrigeration applications), use must be made of a 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 |
| **Touch current according to IEC 60990 (measuring circuit Fig. 4, TN system)** | <= 3.5 mA |
| **Motor protection** | Thermal overload protector (TOP) with basic insulation |
| **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 60034-1; CE |
| **Approval** | VDE; CSA C22.2 No. 100; EAC; UL 1004-1 |

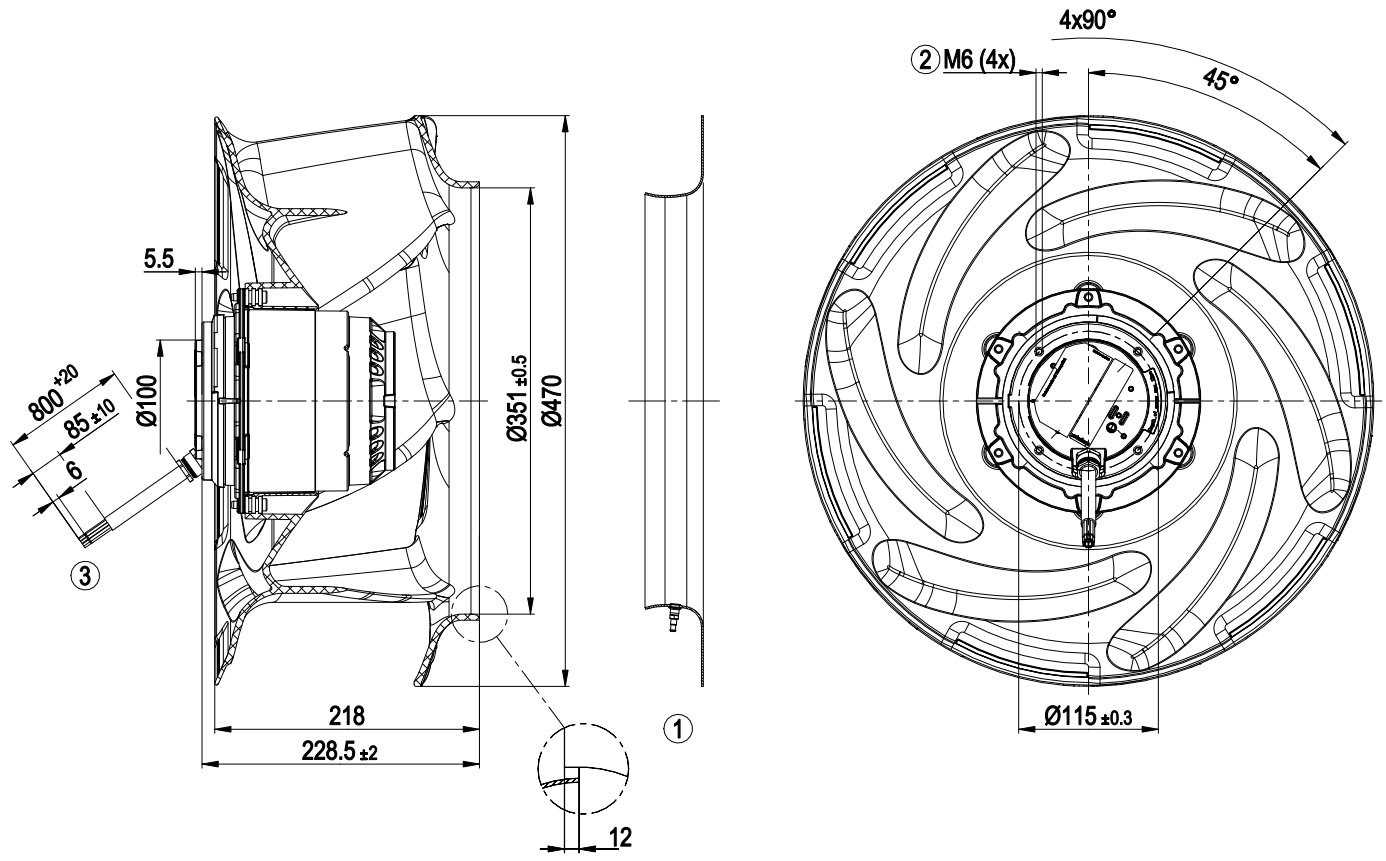


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## Product drawing




| | |
|---|---|
| 1 | Accessory part: Inlet ring 45355-2-4013 with pressure tap (k-factor: 250) (not included in scope of delivery) |
| 2 | Max. clearance for screw 12 mm |
| 3 | Cable silicone 9G 0.75 mm² |
| | 9x splice |

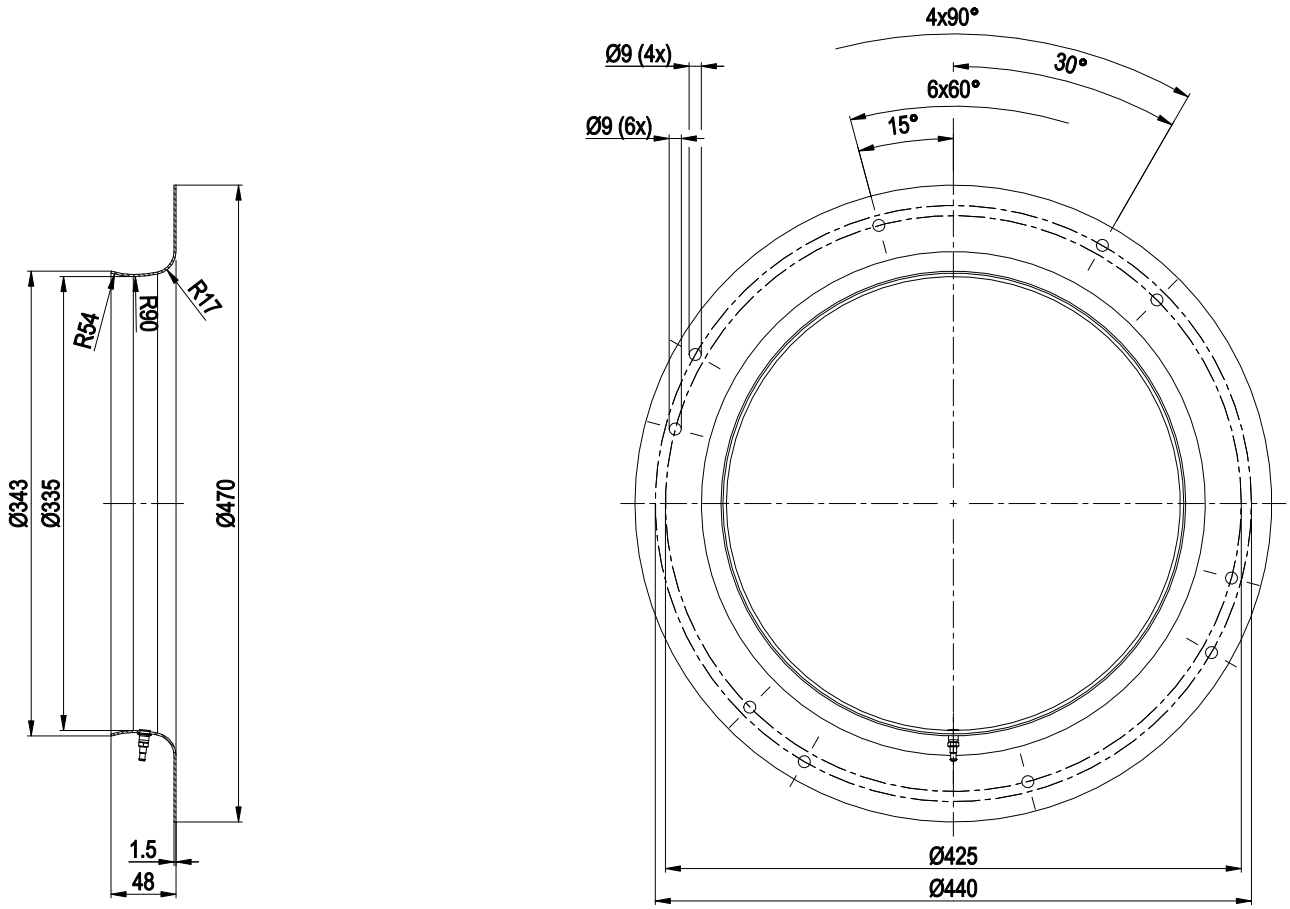


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## Accessory part




Inlet ring 45355-2-4013 with pressure tap (k-factor: 250)

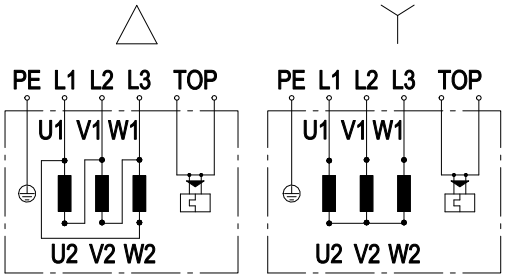


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## Connection diagram




Note: Change of rotation direction by reversing two phases

| | | | | | |
|---|---|---|---|---|---|
| Δ | Delta connection | Y | Star connection | L1 | black |
| L2 | blue | L3 | brown | U1 | black |
| V1 | blue | W1 | brown | U2 | green |
| V2 | white | W2 | yellow | TOP | 2x gray |
| PE | green/yellow | | | | |

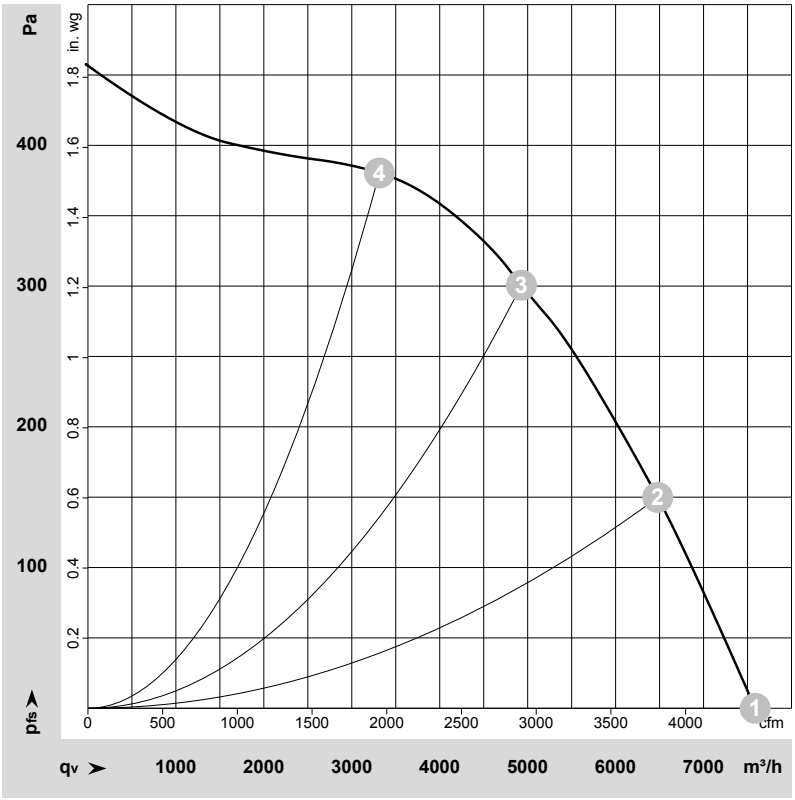


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## Curves: Air performance 50 Hz




ρ = 1.15 kg/m³ ± 2 %

Measurement: LU-208311-1

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

| | Wired | U | f | n | $P_e$ | I | $LpA_{in}$ | $LwA_{in}$ | $LwA_{out}$ | $q_V$ | $p_{fs}$ | $q_V$ | $p_{fs}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | V | Hz | $min^{-1}$ | W | A | dB(A) | dB(A) | dB(A) | $m^3/h$ | Pa | cfm | in. wg |
| 1 | Y | 400 | 50 | 1445 | 535 | 1.84 | 69 | 77 | 80 | 7585 | 0 | 4465 | 0.00 |
| 2 | Y | 400 | 50 | 1430 | 655 | 1.90 | 66 | 74 | 78 | 6480 | 150 | 3815 | 0.60 |
| 3 | Y | 400 | 50 | 1420 | 720 | 1.90 | 62 | 70 | 75 | 4930 | 300 | 2900 | 1.20 |
| 4 | Y | 400 | 50 | 1425 | 683 | 1.90 | 63 | 72 | 76 | 3315 | 380 | 1950 | 1.53 |

Wired = Wiring · U = Voltage · f = Frequency · n = Speed (rpm) · $P_e$ = Power consumption · I = Current draw · $LpA_{in}$ = Sound pressure level intake side · $LwA_{in}$ = Sound power level intake side
$LwA_{out}$ = Sound power level outlet side · $q_V$ = Air flow · $p_{fs}$ = Pressure increase

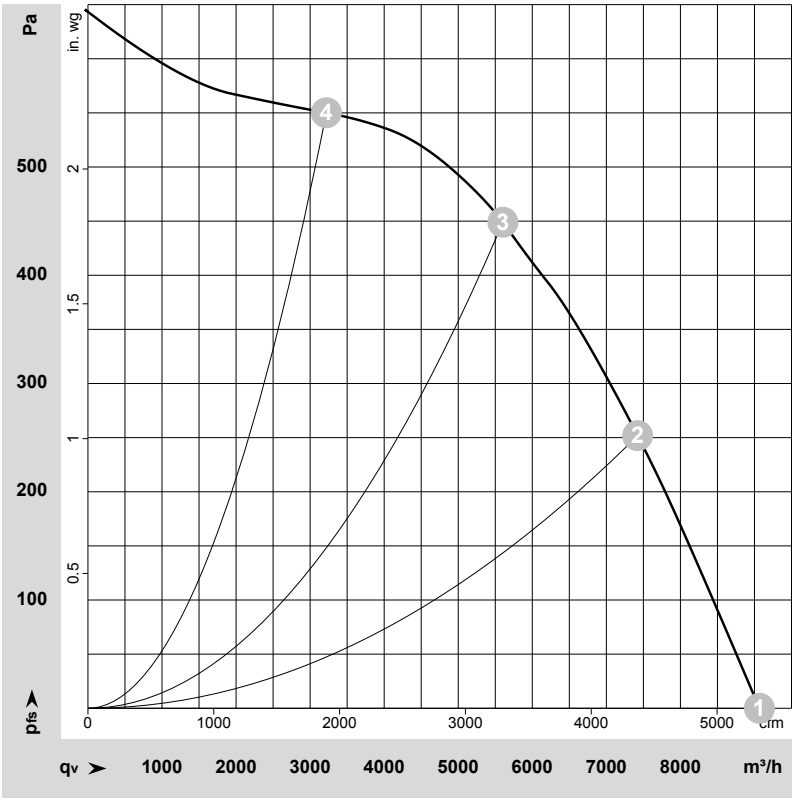


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## Curves: Air performance 60 Hz




ρ = 1.15 kg/m³ ± 2 %

Measurement: LU-208354-1

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

| | Wired | U | f | n | $P_e$ | I | $LpA_{in}$ | $LwA_{in}$ | $LwA_{out}$ | $q_V$ | $p_{fs}$ | $q_V$ | $p_{fs}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | V | Hz | $min^{-1}$ | W | A | dB(A) | dB(A) | dB(A) | $m^3/h$ | Pa | cfm | in. wg |
| 1 | Y | 480 | 60 | 1720 | 864 | 2.00 | 74 | 81 | 84 | 9065 | 0 | 5335 | 0.00 |
| 2 | Y | 480 | 60 | 1690 | 1115 | 2.21 | 69 | 77 | 81 | 7420 | 250 | 4370 | 1.00 |
| 3 | Y | 480 | 60 | 1680 | 1190 | 2.20 | 67 | 75 | 79 | 5605 | 450 | 3300 | 1.81 |
| 4 | Y | 480 | 60 | 1695 | 1059 | 2.14 | 71 | 79 | 82 | 3220 | 550 | 1895 | 2.21 |

Wired = Wiring · U = Voltage · f = Frequency · n = Speed (rpm) · $P_e$ = Power consumption · I = Current draw · $LpA_{in}$ = Sound pressure level intake side · $LwA_{in}$ = Sound power level intake side
$LwA_{out}$ = Sound power level outlet side · $q_V$ = Air flow · $p_{fs}$ = Pressure increase



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