Serving North America with the highest quality
MOTORIZED IMPELLERS, FANS and BLOWERS

We are proud to be a part of the ROSENBERG family of companies:

Rosenberg Ventilatoren GmbH
Kunzelsau, Germany

ECOFIT S.A.
Vendome, France

ETRI
Paris, France

Our family of companies is supported by over 900 employees with state-of-the art R&D and manufacturing throughout the world. Rosenberg USA, with offices and warehouse in Monroe, NC, is uniquely qualified to service all your air handling applications:

• Technical Expertise & Application Engineering
• Outstanding Customer Service
• Design Flexibility & Custom Fan/Motor Equipment
• Stock Fans for Immediate Shipment
• Full Line of Accessory Products & Controls
• Value Added Manufacturing & Fabrication
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<th>D</th>
<th>Three phase A.C.</th>
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<td>Free running impeller with external rotor motor</td>
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</tr>
<tr>
<td>Type</td>
<td>R</td>
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<td></td>
<td>M</td>
<td>Fan module for assembly</td>
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<td>F=2-2</td>
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<tr>
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<td>4=4</td>
<td>G=4-4</td>
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<td>6=6</td>
<td>H=6-6</td>
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<td>S</td>
<td>Flying leads</td>
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<tr>
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<td>W</td>
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<td>D=3</td>
<td>e.g. FF = 55 mm</td>
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**Consecutive number**
Characteristics and Construction

Rosenberg Radial Fans with free-running impeller type E/DKHR form a compact and constructively optimal fan unit by combining an external rotor motor and a backward-curved impeller.

During development of the backward curved impeller, Rosenberg attached great importance to high efficiency and at the same time a most optimal sound level.

Fans of this construction are designed for installation in appliances such as air handling units, hygienic units, clean room filter units and air conditioning units.

The fans are for clean air application and ventilation of non-aggressive vapors and fumes.

The standard execution is the construction:
- **_KHR** : Motorized impeller without inlet cone (inlet cone as an option)

Available on request:
- **_KHM** : Fan module
- Special solutions according to customer requirements (OEM)
H-series:
The impellers with 6 backward curved blades are made of polyamid 6.6 with 30% fiber glass. The back plate of the impeller is galvanized steel. Aluminum impellers are available as an option.

W-series:
The impellers with 8 backward curved blades are made of Aluminum sheet (AlMg3). Steel impellers with epoxy coating can also be supplied if requested.

The impellers are statically and dynamically balanced with external rotor motor according to quality level G2,5 DIN ISO 1940.

Direction of rotation
The direction of rotation of the impeller viewed from the inlet side is clockwise. Wrong direction of rotation can overload the motor. It is essential to check the direction of rotation prior to operation.

Inlet cones
The inlet cones are made of galvanized steel. They are fluidic optimized to supply a good airflow towards the impeller. The optimal immersion depth of the impeller is described on each dimensional sheet.

Motors
Rosenberg external rotor motors are in protection class IP54. The winding insulation corresponds to insulation Class F.
Ball bearings, closed on both sides are used. Special grease lubrication provides maintenance-free operation, low-noise and extended life.

Motor protection
All motors are equipped with thermal contacts, wired in series. Thermal contacts are temperature dependent control elements, sensing the winding temperature of the motor. These contacts protect the motor windings from overload, failure of a mains phase, locking of the motor and from too high temperatures of the medium to be ventilated.
In addition to the mounted thermal contacts we recommend the use of our motor protection control units.
Rosenberg also offers 5-step voltage controls, RTE and RTD types.
By use of this controllers an additional motor protection switch is not required.
Electrical connection

The nominal voltage given on the nameplate provides maximum allowable voltage tolerance of ± 10%.
Flying leads are standard.
The connection ends are 10 cm (4 inches) dismantled and equipped with end splices.
Standard cable length is 68 cm (27 inches)
Special cable lengths are available on request.

Voltages types

For single phase operation, motors are available for 115V, 208/230V and 277V.
All 230V motors could also be used at 1-230V, 50Hz.
For three phase operation, motors are available for 208V / 230V ∆ // 460V Y.
Please reference 60Hz-curves:
- Standard three phase motor can be used at 460V (Star connection) and 230V (Delta connection). In Delta connection the motors are also suitable for 208V 3~ power supplies).
- The performance curves show that the 230V∆ performance is a little less than the 460VY performance.
The standard three phase motors could also be used at 400V Y, 50Hz.

Speed control

Speed control can be provided for fans that demand optimal adjustment of the operation point. Speed control is obtained by “Voltage Control” and “Frequency Control”, as described below.

Voltage control

The speed control is provided by reduction of the terminal voltage. If the voltage will be reduced the speed of the motor decreases and the air volume flow sinks in proportion with the speed. The matching voltage controllers can be provided on request.

Frequency control

All voltage controllable fans for three-phase power supplies can also be speed controlled by frequency converter from 60Hz downwards. The speed control is realized by reduction of the power supply frequency. At higher frequencies than 60Hz the motor will be thermally overloaded.

With operation of the motors on a frequency controller the maximum speed of voltage increase of 500V /µs must not be exceeded. According to the frequency converter type and the length of the cable between motor and frequency converter additional components must be planned. Please refer to the operation manual of the frequency converter.

Volume flow monitor / control

A simple volume flow determination and monitoring in an installed condition is possible with ring testing wire on the inlet cone. For this the manufacturer places the relevant gauging performance curves at one’s disposal.
The fans are constructed for installation within customer provided casing. We do not include guards of any kind as a part of our standard product offering. Please contact your Rosenberg representative for accessory information. Before initial operation all required protection components must be installed and connected. Adherence to all electrical and safety codes, including National Electric Codes (NEC), National Fire Protection Association (NFPA) standards and Occupational Safety and Health Act (OSHA) should be followed and are responsibility of the customer. All electrical connections should be performed only by qualified personnel.

Rosenberg radial fans with free running impeller are usable machines according to the EC Council Directive on Machinery. They are marked with a CE label and delivered with a declaration of conformity. The dangers of the fan as well as necessary technical measures of safety are judged according to the VDMA standard sheet number 24167: Fans, demands of safety. The operation manual contains additional measures of safety to be realized on site to make the fan match the EC Council Directive on Machinery 98/37/EC.

Advantages of radial fans with free-running impeller:

- Easy to install due to installation of the complete fan module
- Low for maintenance direct drive fans (no belt wear or belt replacement necessary)
- Hygienic, easy to clean
- Compact, space-saving ventilation units with external rotor motor drive and high performance backward curved impeller.
- Various control possibilities
- Easy determination of the airflow with measuring device
- Customers requirements can be met without problems
- High economic efficiency
Air Performance Curves

The air performance curves have been established using the inlet test method in the test chamber as shown below according to German standard DIN 24163. They are valid for air with a density of 0.075#/ft³ with a temperature of 68°F. The performance curves were made in mounting position A (free inlet, free outlet) and show the pressure increase, available on inlet side, $p_{fa}$ as a function of the volume.

![Diagram of test chamber](image)

1. Inlet cone
2. Transition parts
3. Throttling device with straightener
4. Screens
5. Straightener
6. Measuring chamber with shutters
7. Inlet cone pressure manometer ($p_d$)
8. Pressure manometer $\Delta p_{fa}$
Noise levels
The tests and their performance curves were made according to DIN 45635, part 38, according to the envelope surface method, after collection several test points by a cube shaped test area.

The characteristic diagram shows the “A” decibel Sound Power level $L_{W(A)}$. This corresponds to the free-outlet sound power level $L_{W(A)_{ref}}$.

The free inlet sound power level $L_{W(A)}$ can be obtained by the relative sound power level or according to following calculation:

$$L_{W(A)} = L_{W(A)_{ref}} - 6 \text{ dB(A)}$$

For the exact determination of the sound protection measures the sound power level of the octave bands are important.

$$L_{W_{oct}} = L_{W(A)} + L_{rel}$$

H-series:

<table>
<thead>
<tr>
<th>_KH_H</th>
<th>relative sound power level $L_{W_{oct}}$ [dB] at octave medium frequencies fm [Hz]</th>
</tr>
</thead>
<tbody>
<tr>
<td>inlet side</td>
<td>size</td>
</tr>
<tr>
<td>315 / 355</td>
<td>-4</td>
</tr>
<tr>
<td>400 / 450</td>
<td>-4</td>
</tr>
<tr>
<td>outlet side</td>
<td>size</td>
</tr>
<tr>
<td>400 / 450</td>
<td>-2</td>
</tr>
</tbody>
</table>

W-series:

<table>
<thead>
<tr>
<th>_KH_W</th>
<th>relative sound power level $L_{W_{oct}}$ [dB] at octave medium frequencies fm [Hz]</th>
</tr>
</thead>
<tbody>
<tr>
<td>inlet side</td>
<td>size</td>
</tr>
<tr>
<td>250 / 280</td>
<td>-1</td>
</tr>
<tr>
<td>315 / 355</td>
<td>-4</td>
</tr>
<tr>
<td>400 / 450</td>
<td>-4</td>
</tr>
<tr>
<td>500 / 560</td>
<td>-3</td>
</tr>
<tr>
<td>630</td>
<td>-2</td>
</tr>
<tr>
<td>710</td>
<td>-2</td>
</tr>
<tr>
<td>outlet side</td>
<td>size</td>
</tr>
<tr>
<td>315 / 355</td>
<td>-3</td>
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<tr>
<td>400 / 450</td>
<td>-2</td>
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<tr>
<td>500 / 560</td>
<td>-2</td>
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<tr>
<td>630</td>
<td>-4</td>
</tr>
<tr>
<td>710</td>
<td>-2</td>
</tr>
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</table>
Installation in casings or air handling units

We recommend to use the installation ratio

\[
\frac{\text{Internal dimension of casing } A}{\text{external dimension of impeller } D} > 1.6
\]

when installing a radial fan with free-running impeller into a casing. The following diagram shows installation losses with recommended and too small installation ratio.

The expected sound pressure level on the outlet side can only be approximately determined as the ambient influences can lead to strong deviations.

\[
L_{w(A)} = L_{w(A)} - \Delta L
\]

\(a\) = without reflections
\(b\) = with reflections

---

1. Catalogue performance curve without casing: 100% nominal air performance
2. Performance curve with A/D = 1.6: 98% nominal air performance
3. Performance curve with A/D = 1.2: 92% nominal air performance

On the inlet side a minimum distance of 0.5 x D to adjoining parts has to be kept. So losses on pressure side must not be taken in consideration.
Performance Curves

The performance curves indicate the static pressure increase $\Delta p_{fa}$ as a function of the volume flow. The performance curves refer to an air density of 0.075 #/ft³.

**Fan performance curve at rated voltage 60Hz:**

**Single phase motors:**
- Curve A = rated voltage (115 V or 230 V; depends on motor execution)

**Three phase motors:**
- Curve A = 460 V Y-connection
- Curve B = 230 V D-connection

**Fan performance curve at rated voltage 50 Hz**

**Information:**
- Every three phase motor can be used at 460 V (Star connection) and 230 V (Delta connection).
- The performance curves show that the 230V$\Delta$ (curve B) performance is a little less than the 460VY (curve A) performance. In Delta connection the motors are also suitable for 208V 3~ power supplies.

### Technical Information

<table>
<thead>
<tr>
<th>Type</th>
<th>$U$ [Vol]</th>
<th>$f$ [Hz]</th>
<th>Curve</th>
<th>$P_1$ [kW]</th>
<th>$I_\text{A}$ [A]</th>
<th>$n$ [min$^{-1}$]</th>
<th>$t_\text{R}$ [°C]</th>
<th>$C$ [µF]</th>
<th>$\Delta I$ [%]</th>
<th>$I_\text{s}/I_\text{A}$</th>
<th>$\Delta$ [kg]</th>
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</thead>
<tbody>
<tr>
<td>DKH_310-4SH70.4DA</td>
<td>3~460Y</td>
<td>60</td>
<td>A</td>
<td>0.195</td>
<td>0.34</td>
<td>1630</td>
<td>158</td>
<td>70</td>
<td>-</td>
<td>2.9</td>
<td>54</td>
</tr>
<tr>
<td>DKH_310-4SH70.4DA</td>
<td>3~230$\Delta$</td>
<td>60</td>
<td>B</td>
<td>0.195</td>
<td>0.55</td>
<td>1575</td>
<td>158</td>
<td>70</td>
<td>-</td>
<td>2.9</td>
<td>54</td>
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<tr>
<td>DKH_310-4SH70.4DA</td>
<td>3~400Y</td>
<td>50</td>
<td>C</td>
<td>0.135</td>
<td>0.33</td>
<td>1390</td>
<td>140</td>
<td>60</td>
<td>-</td>
<td>2.8</td>
<td>54</td>
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### Information of the dimensions in inch and mm!
**H-series**

12.20" (310)

<table>
<thead>
<tr>
<th>U [V]</th>
<th>f [Hz]</th>
<th>Curve</th>
<th>( P_1 ) [kW]</th>
<th>( I_N ) [A]</th>
<th>( n ) [min⁻¹]</th>
<th>( t_R ) [°F]</th>
<th>( t_F ) [°C]</th>
<th>C [µF]</th>
<th>( \Delta I ) [%]</th>
<th>( I_A / I_N )</th>
<th>( \Delta \rho_{fa} ) [in.WG]</th>
<th>( \rho_{fa} ) [Pa]</th>
<th>( \rho ) [kg]</th>
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<tbody>
<tr>
<td>1 ~115</td>
<td>60 A</td>
<td>0.19</td>
<td>1.54</td>
<td>1550</td>
<td>158</td>
<td>70</td>
<td>3</td>
<td>1.9</td>
<td>54</td>
<td>01.024</td>
<td>4 / 12</td>
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<tr>
<td>1 ~230</td>
<td>60 A</td>
<td>0.19</td>
<td>0.77</td>
<td>1550</td>
<td>158</td>
<td>70</td>
<td>3</td>
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<td>4 / 12</td>
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<tr>
<td>1 ~230</td>
<td>50 B</td>
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<td>0.60</td>
<td>1380</td>
<td>158</td>
<td>70</td>
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<td>2.5</td>
<td>54</td>
<td>01.024</td>
<td>4 / 12</td>
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</table>

**Specifications:**

- **H-series 12.20" (310):**
  - Diameter: 12.20" (310)
  - Number of blades: 4
  - Impeller: 90°
  - Motor: M6 / 4 x 90°
  - Dimensions:
    - Diameter: 14.17" (360)
    - Height: 19.80" (500)

**Notation:**

- \( U \): Voltage
- \( f \): Frequency
- \( P_1 \): Power
- \( I_N \): Nominal current
- \( n \): Speed
- \( t_R \): Temperature rise
- \( t_F \): Temperature range
- \( C \): Capacitance
- \( \Delta I \): Current variation
- \( I_A / I_N \): Ratio
- \( \Delta \rho_{fa} \): Density variation
- \( \rho_{fa} \): Density
- \( \rho \): Mass
### H-series

<table>
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<tbody>
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<td>A</td>
<td>0.195</td>
<td>0.34</td>
<td>1630</td>
<td>158</td>
<td>70</td>
<td>-</td>
<td>-</td>
<td>2.9</td>
<td>54</td>
</tr>
<tr>
<td>3 ~230</td>
<td>60</td>
<td>B</td>
<td>0.195</td>
<td>0.55</td>
<td>1575</td>
<td>158</td>
<td>70</td>
<td>-</td>
<td>-</td>
<td>2.9</td>
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<tr>
<td>3 ~400</td>
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<td>0.33</td>
<td>1390</td>
<td>140</td>
<td>60</td>
<td>-</td>
<td>-</td>
<td>2.8</td>
<td>54</td>
</tr>
</tbody>
</table>

- **DKHR**
- **DKHM**

**Dimensions:**
- Ø 3.54" (90)
- 3.54" (90)
- M6 / 4 x 90°
- ø 0.31" (8)
- ø 0.12" (3)
- ø 0.12" (3)
- 2.76" (70)
- 2.11" (53.5)
- 0.06" (1.5)
- 6.77" (172)
- 4.78" (125)
- 3.78" (96)
- 0.10" (25)
- 0.10" (25)
- 0.12" (3)
- 0.12" (3)

**Manufacturers:**
- ROSENBERG
### H-series 12.20" (310)

#### Technical Specifications

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<thead>
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<th>1 ~ 230 V</th>
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<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
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<td>60</td>
<td>50</td>
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<tr>
<td>Current</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power</td>
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<td>0.235</td>
<td>0.235</td>
<td>0.180</td>
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<tr>
<td>Capacity</td>
<td>[l]</td>
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<td>1390</td>
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<tr>
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<td>158</td>
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<td>Temperature</td>
<td>[°C]</td>
<td>60</td>
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<td>70</td>
</tr>
<tr>
<td>Efficiency</td>
<td>[%]</td>
<td>1.9</td>
<td>1.9</td>
<td>23</td>
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<tr>
<td>Power Factor</td>
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</tr>
<tr>
<td>Weight</td>
<td>[kg]</td>
<td></td>
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</tr>
</tbody>
</table>

#### Diagrams

- EKHR
- EKHM

#### Technical Details

- Diameters: ø 7.60" (193), ø 7.91" (201), ø 10.39" (264), ø 11.26" (286), ø 11.81" (300)
- Angles: 3.54° (90), 3.98° (101), 7.99° (203), 5.00° (127), 6.00° (152)
- Thicknesses: 0.12", 0.10" (2.5)
- Lengths: 3.98° (101), 2.11" (53.5)

#### Graphs

- Performance graph showing V[m³/h] vs. ΔPfa [Pa]
- Efficiency graph showing IN [A] vs. IIA / IN [%]
### 12.20” (310) H-series


<table>
<thead>
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<th></th>
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---

**Diagram:**

- **DKHR**
- **DKHM**

---

**Legend:**

- **A**
- **B**
- **C**

---

**Technical Specifications:**

- **DKHR**
- **DKHM**

---

**Dimensions:**

- 3.98” (101)
- 2.11” (53.5)
- 0.12” (3)
- 0.06” (1.5)
- 8.58” (218)
- 14.17” (360)
- 0.43” (11)
- 0.12” (3)
- 0.06” (1.5)
- 8.58” (218)
- 14.17” (360)
- 0.43” (11)
### H-series

#### KH_355-4 H.125.5 F

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**DKHR**

- M6 / 4 x 90°

**DKHM**

- 15.5° / (385)
- 19.6° / (500)

---

**DKH_355-4 M.50**

- ø 8.98" / (228)
- ø 9.33" / (237)
- ø 11.61" / (300)
- ø 12.60" / (320)
- ø 13.70" / (348)
- ø 3.94" / (100)
- ø 14.37" / (365)

---

**DKHM**

- ø 0.39" / (1,5)
- ø 0.43" / (6.5)

---

**DKH_355-4 F.225**

- ø 8.98" / (228)
- ø 9.33" / (237)
- ø 11.61" / (300)
- ø 12.60" / (320)
- ø 13.70" / (348)
## H-series

### U [V] f [Hz] Curve $P_1$ [kW] $I_N$ [A] $n$ [$\text{min}^{-1}$] $t_R$ [$^\circ\text{C}$] $t_R$ [$^\circ\text{F}$] $C$ [$\mu\text{F}$] $\Delta I$ [%] $I_A / I_N$ $\Delta P_b$ [Pa] $\Delta P_b$ [in.WG] $\rho$ [kg]
| 1 ~115   | 60 | A  | 0.35 | 3.00 | 855  | 158  | 70  | 20 | -   | 1.5 | 54 | 01.024 | 9 / 24 |
| 1 ~230   | 60 | A  | 0.35 | 1.50 | 855  | 158  | 70  | 5  | -   | 1.5 | 54 | 01.024 | 9 / 24 |
| 1 ~230   | 50 | B  | 0.26 | 1.16 | 850  | 158  | 70  | 5  | 10  | 1.9 | 54 | 01.024 | 9 / 24 |

---

### Diagrams

- **EKHR**: (Details of the impeller and housing diagram)
- **EKHM**: (Details of the impeller and housing diagram)

---

### Table Notes
- $\Delta P_b$: Static pressure drop
- $\rho$: Mass density
- $\Delta I$: Current change
- $I_A / I_N$: Load factor

---

### Additional Information
- **U**: Voltage
- **f**: Frequency
- **Curve**
- **$P_1$**: Power
- **$I_N$**: Rated current
- **$n$**: Rated speed
- **$t_R$**: Rated temperature
- **$C$**: Capacitance
- **$\Delta I$**: Current change
- **$I_A / I_N$**: Load factor
- **$\Delta P_b$**: Static pressure drop
### W-series 9.84" (250)

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**DKHR**

M6 / 4 x 90°

**DKHM**

27
### W-series

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<thead>
<tr>
<th>U [V]</th>
<th>f [Hz]</th>
<th>Curve</th>
<th>P&lt;sub&gt;1&lt;/sub&gt; [kW]</th>
<th>I&lt;sub&gt;N&lt;/sub&gt; [A]</th>
<th>n [min&lt;sup&gt;-1&lt;/sup&gt;]</th>
<th>t&lt;sub&gt;R&lt;/sub&gt; [°F]</th>
<th>t&lt;sub&gt;R&lt;/sub&gt; [°C]</th>
<th>C [µF]</th>
<th>∆I [%]</th>
<th>I&lt;sub&gt;A&lt;/sub&gt; / I&lt;sub&gt;N&lt;/sub&gt;</th>
<th>X</th>
<th>m [kg]</th>
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</thead>
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<tr>
<td>1 ~ 115</td>
<td>60</td>
<td>A</td>
<td>1.20</td>
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<td>16</td>
<td>13</td>
<td>2.8</td>
<td>54</td>
<td>01.024</td>
</tr>
</tbody>
</table>

### Dimensions

- **EKHR**
  - Ø 3.94" (100)
  - Ø 11.26" / Ø 174° (ø 286)
  - Ø 12.60" / Ø 19.69" (ø 307)
- **EKHM**
  - Ø 11.18" (284)
  - Ø 6.85" / 6x60° (ø 174°)
  - Ø 9.84" / 6x60° (ø 286°)
  - Ø 12.09" (ø 284)
  - Ø 19.69" (ø 307)

### Notes
- **Curve P1**
- **IN** [A]
- **n** [min<sup>-1</sup>]
- **t<sub>R</sub>** [°F]
- **t<sub>R</sub>** [°C]
- **C** [µF]
- **ΔI** [%]
- **I<sub>A</sub> / I<sub>N</sub>**
- **X**
- **m** [kg]
### 12.40" (315) W-series

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<td>54</td>
<td>01.005</td>
<td>5 / 12.5</td>
</tr>
</tbody>
</table>

**DKHR**

- M6 / 4 x 90°
- ø 0.43" (5.5)
- ø 7.68" (195)
- ø 8.35" (212)
- ø 12.60" / 6 x 60° (360)
- ø 13.70" (320)
- ø 0.67" (17)
- ø 2.32" (5.8)
- ø 3.16" (7.9)
- ø 7.57" (192)
- ø 0.10" (2.5)
- ø 8.86" (225)
- ø 9.45" (240)
- ø 5.75" (146)
- ø 6.73" (171)
- ø 0.06" (1.5)

**DKHM**

- ø 4.57" (114)
- ø 14.17" (360)
- ø 17.72" (450)
- ø 19.69" (500)
### Table

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<thead>
<tr>
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<th>Frequency</th>
<th>Curve</th>
<th>Power</th>
<th>Current</th>
<th>Rotations</th>
<th>Temperature</th>
<th>Capacitance</th>
<th>Current Ratio</th>
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### Diagram

- **DKHR**: 13.98" (355)
- **DKHM**: 13.98" (355)
W-series

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<td>01.024</td>
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- **EKH_355-4_W.110.5FA**

- **Curve P1**

- **IN**

- **tR**

- **tfa**

- **C**

- **∆f [%]**

- **IA / IN**

- **[kg]**
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<th>$t_R$ [°F]</th>
<th>$t_R$ [°C]</th>
<th>$C$ [µF]</th>
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## W-series

### Specifications

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### Diagrams

- **DKHR**: Dimensions and design features.
- **DKHM**: Dimensions and design features.

---

*Note: The table and diagrams provide detailed specifications and design elements for the W-series fans.*
### Table: Specifications for 24.80" (630) W-series

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### Diagrams
- **Diagram 1:** Fan model KH_630-6_W.195.7KF
- **Diagram 2:** Technical dimensions for DKHR and DKHM models.
No. 01.005
Three phase motor in Y connection with thermal contacts. Changing of rotation direction by interchanging of 2 phases.

No. 01.006
Three phase motor in delta connection with thermal contacts. Changing of rotation direction by interchanging of 2 phases.

No. 01.024 clockwise
Single phase A.C. motor with operating capacitor and thermal contact. Thermal contact wired in series with windings, if RE controllers are used. Insert bridge (x) and wire connections shown as dash-line on the drawing.
Please contact us: