Air Knocker

Original Pneumatic Hammering Technology

Sticky and compacted material is loosened by the impact of the Knocker piston with adjustable force provided by variable air pressure.

Design Features

- Impact force can be adjusted by input pressure. 44-102 PSI (0.3-0.7MPa)
- Relay piping function allows operation of multiple Knockers by one controlling valve.
- Simple design, excellent durability and easy maintenance.
- Simple working principle eliminates complicated operating circuits. Remote operation is also easy.

Operating Principle

1. Compressed air delivered to Knocker is supplied into the valve chest, which pushes the valve down.

2. The 3-way valve exhausts air and compressed air in the chamber closes the valve.

3. As the valve moves, compressed air in the chamber forces piston down on the base plate, which results in vibration that eliminates clinging materials.
**Indirect Impact Type**

**APPLICATIONS:**
- Sewage sludge fuel production facilities
- Dust hopper in waste treatment plants
- Recycle fuel (compressed wood) supply hoppers
- Glass cullet storage hoppers
- Livestock forage silos
- Injection of silica gel
- Calcination of raw material on walls
- Ash in recycling plants and ejection of aluminum powder
- Piping in pharmaceutical plants

**Dimensions Table (inches)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Øk</th>
<th>Ør</th>
<th>ØL</th>
<th>ØF</th>
<th>L</th>
<th>H</th>
<th>I</th>
<th>ØI</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNR-20</td>
<td>2.59</td>
<td>2.25</td>
<td>0.43</td>
<td>-</td>
<td>-</td>
<td>0.13</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>KNR-30</td>
<td>3.39</td>
<td>2.75</td>
<td>0.43</td>
<td>0.59</td>
<td>0.33</td>
<td>0.75</td>
<td>(0.94)</td>
<td>0.46</td>
</tr>
<tr>
<td>KNR-40</td>
<td>3.94</td>
<td>3.75</td>
<td>0.55</td>
<td>0.95</td>
<td>0.66</td>
<td>0.95</td>
<td>(1.1)</td>
<td>0.83</td>
</tr>
<tr>
<td>KNR-60</td>
<td>4.53</td>
<td>4.53</td>
<td>0.68</td>
<td>1.38</td>
<td>1.13</td>
<td>1.38</td>
<td>(1.5)</td>
<td>1.25</td>
</tr>
<tr>
<td>KNR-80</td>
<td>5.75</td>
<td>5.83</td>
<td>0.72</td>
<td>1.75</td>
<td>1.64</td>
<td>1.75</td>
<td>(2.0)</td>
<td>1.83</td>
</tr>
<tr>
<td>KNR-100</td>
<td>6.89</td>
<td>6.89</td>
<td>0.80</td>
<td>2.14</td>
<td>2.04</td>
<td>2.14</td>
<td>(2.4)</td>
<td>2.25</td>
</tr>
</tbody>
</table>

**Direct Impact Type**

**APPLICATIONS:**
- Remove material from molds
- Rotary dryers
- Powdered paint
- Furnaces

**Dimensions Table (inches)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Øk</th>
<th>Ør</th>
<th>ØL</th>
<th>ØF</th>
<th>L</th>
<th>H</th>
<th>I</th>
<th>ØI</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNR-30-DI</td>
<td>2.59</td>
<td>2.75</td>
<td>0.31</td>
<td>0.59</td>
<td>0.13</td>
<td>3.73</td>
<td>(0.98)</td>
<td>0.33</td>
</tr>
<tr>
<td>KNR-40-DI</td>
<td>3.39</td>
<td>3.73</td>
<td>0.47</td>
<td>0.92</td>
<td>2.17</td>
<td>5.52</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td>KNR-60-DI</td>
<td>4.53</td>
<td>5.44</td>
<td>0.55</td>
<td>1.38</td>
<td>2.56</td>
<td>7.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNR-80-DI</td>
<td>5.75</td>
<td>5.83</td>
<td>0.63</td>
<td>1.88</td>
<td>2.36</td>
<td>8.73</td>
<td>(1.11)</td>
<td>0.67</td>
</tr>
<tr>
<td>KNR-100-DI</td>
<td>6.89</td>
<td>8.19</td>
<td>0.78</td>
<td>2.14</td>
<td>1.97</td>
<td>10.63</td>
<td>0.83</td>
<td></td>
</tr>
</tbody>
</table>

M" means curve surface dimension.

**Weight includes base.**

---

**Knocker Models & Specifications**

**Indirect Impact Type**

<table>
<thead>
<tr>
<th>Model</th>
<th>Working Pressure (PSI)</th>
<th>Stroke Cycle (cycle/min)</th>
<th>Air Consumption (cf/cycle)</th>
<th>Stroke Energy (lbf • ft)</th>
<th>Impulsive Force (lb)</th>
<th>Weight (lb)</th>
<th>ft • lbf/s</th>
<th>Convert into Hammer pound (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNR-20</td>
<td>44 - 102</td>
<td>1 - 60</td>
<td>0.001 - 0.004</td>
<td>3.2 - 6.1</td>
<td>Below 0.6</td>
<td>1.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNR-30</td>
<td>0.002 - 0.005</td>
<td>4.1 - 9.7</td>
<td>8.7 - 13.0</td>
<td>Below 1.0</td>
<td>3.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNR-40</td>
<td>0.005 - 0.013</td>
<td>6.8 - 16.4</td>
<td>18.8 - 28.9</td>
<td>1.0 - 1.5</td>
<td>7.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNR-60</td>
<td>0.010 - 0.027</td>
<td>15.2 - 36.1</td>
<td>49.9 - 76.7</td>
<td>1.5 - 3.0</td>
<td>20.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNR-80</td>
<td>0.021 - 0.049</td>
<td>33.3 - 80.4</td>
<td>109.9 - 171.4</td>
<td>3.0 - 8.0</td>
<td>32.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNR-100</td>
<td>0.034 - 0.080</td>
<td>60.8 - 148.3</td>
<td>217.0 - 339.2</td>
<td>6.0 - 15.0</td>
<td>75.1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Direct Impact Type**

<table>
<thead>
<tr>
<th>Model</th>
<th>Working Pressure (PSI)</th>
<th>Stroke Cycle (cycle/min)</th>
<th>Air Consumption (cf/cycle)</th>
<th>Stroke Energy (lbf • ft)</th>
<th>Impulsive Force (lb)</th>
<th>Weight (lb)</th>
<th>ft • lbf/s</th>
<th>Convert into Hammer pound (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNR-30-DI</td>
<td>44 - 102</td>
<td>1 - 60</td>
<td>0.002 - 0.005</td>
<td>4.1 - 9.7</td>
<td>Below 1.0</td>
<td>4.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNR-40-DI</td>
<td>0.005 - 0.013</td>
<td>6.8 - 16.4</td>
<td>18.8 - 36.9</td>
<td>1.5 - 3.0</td>
<td>12.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNR-60-DI</td>
<td>0.010 - 0.027</td>
<td>15.2 - 36.1</td>
<td>49.9 - 76.7</td>
<td>1.5 - 3.0</td>
<td>28.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNR-80-DI</td>
<td>0.021 - 0.049</td>
<td>33.3 - 80.4</td>
<td>109.9 - 171.4</td>
<td>3.0 - 8.0</td>
<td>40.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNR-100-DI</td>
<td>0.034 - 0.080</td>
<td>60.8 - 148.3</td>
<td>217.0 - 339.2</td>
<td>6.0 - 15.0</td>
<td>78.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Weight includes base.**

---

**Specifications**

**Model**

- KNR-20
- KNR-30-DI, KNR-40-DI
- KNR-60-DI, KNR-80-DI
- KNR-100-DI

**Applications**

- Sewage sludge fuel production facilities
- Dust hopper in waste treatment plants
- Recycle fuel (compressed wood) supply hoppers
- Glass cullet storage hoppers
- Livestock forage silos
- Injection of silica gel
- Calcination of raw material on walls
- Ash in recycling plants and ejection of aluminum powder
- Piping in pharmaceutical plants

**Weight includes base.**

- KNR-20: 2.25 lb
- KNR-30-DI: 3.73 lb
- KNR-40-DI: 5.52 lb
- KNR-60-DI: 7.2 lb
- KNR-80-DI: 8.73 lb
- KNR-100-DI: 10.63 lb

**Dimensions Table (inches)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Øk</th>
<th>Ør</th>
<th>ØL</th>
<th>ØF</th>
<th>L</th>
<th>H</th>
<th>I</th>
<th>ØI</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNR-20</td>
<td>2.59</td>
<td>2.25</td>
<td>0.43</td>
<td>-</td>
<td>-</td>
<td>0.13</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>KNR-30</td>
<td>3.39</td>
<td>2.75</td>
<td>0.43</td>
<td>0.59</td>
<td>0.33</td>
<td>0.75</td>
<td>(0.94)</td>
<td>0.46</td>
</tr>
<tr>
<td>KNR-40</td>
<td>3.94</td>
<td>3.75</td>
<td>0.55</td>
<td>0.95</td>
<td>0.66</td>
<td>0.95</td>
<td>(1.1)</td>
<td>0.83</td>
</tr>
<tr>
<td>KNR-60</td>
<td>4.53</td>
<td>4.53</td>
<td>0.68</td>
<td>1.38</td>
<td>1.13</td>
<td>1.38</td>
<td>(1.5)</td>
<td>1.25</td>
</tr>
<tr>
<td>KNR-80</td>
<td>5.75</td>
<td>5.83</td>
<td>0.72</td>
<td>1.75</td>
<td>1.64</td>
<td>1.75</td>
<td>(2.0)</td>
<td>1.83</td>
</tr>
<tr>
<td>KNR-100</td>
<td>6.89</td>
<td>6.89</td>
<td>0.80</td>
<td>2.14</td>
<td>2.04</td>
<td>2.14</td>
<td>(2.4)</td>
<td>2.25</td>
</tr>
</tbody>
</table>

M" means curve surface dimension.
### Knocker Models & Specifications

**Stainless Steel**

**APPLICATIONS:**
- Coffee bean roasting machines
- Resin pellet hoppers
- Ejection of film materials
- Salt and sugar clogging

**Model Working Pressure**
- KNR-15-SS: 44 - 102 PSI
- KNR-20-SS: 44 - 102 PSI
- KNR-30-SS: 68 - 164 PSI
- KNR-40-SS: 68 - 164 PSI
- KNR-60-SS: 68 - 164 PSI

**Impulsive Force**
- KNR-15-SS: 2.0 - 3.6 lb
- KNR-20-F: 2.0 - 3.6 lb
- KNR-30-SS: 4.9 - 9.7 lb
- KNR-40-SS: 6.8 - 16.4 lb
- KNR-60-SS: 15.2 - 36.1 lb

**Weight**
- KNR-15-SS: 0.9 lb
- KNR-20-F: 2.1 lb
- KNR-30-SS: Below 1.0 lb
- KNR-40-SS: 1.0 - 1.5 lb
- KNR-60-SS: 1.5 - 3.0 lb

**Model Installation Scope**
- KNR-15-SS: 44 - 102 PSI
- KNR-20-F: 44 - 102 PSI
- KNR-30-SS: 68 - 164 PSI
- KNR-40-SS: 68 - 164 PSI
- KNR-60-SS: 68 - 164 PSI

**Air Consumption**
- KNR-15-SS: 0.001 - 0.002
- KNR-20-F: 0.001 - 0.004
- KNR-30-SS: 0.002 - 0.005
- KNR-40-SS: 0.005 - 0.013
- KNR-60-SS: 0.012 - 0.027

**Stroke Cycle**
- KNR-15-SS: 1 - 60 cycle/min
- KNR-20-F: 1 - 60 cycle/min
- KNR-30-SS: 1 - 60 cycle/min
- KNR-40-SS: 1 - 60 cycle/min
- KNR-60-SS: 1 - 60 cycle/min

**Model Protection Class**
- KNR-15-F: IP54
- KNR-20-F: IP54
- KNR-30-SS: IP54
- KNR-40-SS: IP54
- KNR-60-SS: IP54

**Impulsive Force**
- KNR-15-F: 4.0 - 6.1 lb
- KNR-20-F: 4.0 - 6.1 lb
- KNR-30-SS: 6.8 - 16.4 lb
- KNR-40-SS: 15.2 - 36.1 lb

**Weight**
- KNR-15-F: 2.0 lb
- KNR-20-F: 2.0 lb
- KNR-30-SS: Below 0.6 lb
- KNR-40-SS: Below 1.0 lb

**Model Installation Scope**
- KNR-15-F: 44 - 102 PSI
- KNR-20-F: 44 - 102 PSI
- KNR-30-SS: 68 - 164 PSI
- KNR-40-SS: 68 - 164 PSI
- KNR-60-SS: 68 - 164 PSI

**Air Consumption**
- KNR-15-F: 0.001 - 0.004
- KNR-20-F: 0.001 - 0.004
- KNR-30-SS: 0.002 - 0.005
- KNR-40-SS: 0.005 - 0.013
- KNR-60-SS: 0.012 - 0.027

**Stroke Cycle**
- KNR-15-F: 1 - 60 cycle/min
- KNR-20-F: 1 - 60 cycle/min
- KNR-30-SS: 1 - 60 cycle/min
- KNR-40-SS: 1 - 60 cycle/min
- KNR-60-SS: 1 - 60 cycle/min

**Model Protection Class**
- KNR-15-F: IP54
- KNR-20-F: IP54
- KNR-30-SS: IP54
- KNR-40-SS: IP54
- KNR-60-SS: IP54

**Impulsive Force**
- KNR-15-F: 4.0 - 6.1 lb
- KNR-20-F: 4.0 - 6.1 lb
- KNR-30-SS: 6.8 - 16.4 lb
- KNR-40-SS: 15.2 - 36.1 lb

**Weight**
- KNR-15-F: 2.0 lb
- KNR-20-F: 2.0 lb
- KNR-30-SS: Below 0.6 lb
- KNR-40-SS: Below 1.0 lb

### Control Panel Models & Specifications

**AOC Control Panel**

- **APPLICATIONS:** Air-only (no electric) Knocker operation
- **APPLICATIONS:** Knocker’s operation interval can be easily adjusted with the speed controller
- **APPLICATIONS:** If relay piping is used, up to three knockers are controllable

**Model**
- KNR-CONTROL

**Installation Scope**
- Indoor / Outdoor

**Power Supply**
- Air Control

**Working Pressure**
- 44 - 102 PSI

**Working Fluid Temperature**
- 41 - 100 °F

**Approx. Dimensions**
- 5.75 x 3.75 x 8.00 in

**Weight**
- 2.1 lb

**HKA Control Panel**

- **APPLICATIONS:** Alternate air-only controller with integrated panel

**Model**
- KNR-CONTROL

**Installation Scope**
- Indoor / Outdoor

**Power Supply**
- Air Control

**Working Pressure**
- 44 - 102 PSI

**Working Fluid Temperature**
- 41 - 100 °F

**Approx. Dimensions**
- 17 x 15 x 8.63 in

**Weight**
- 26.5 lb
**Use & Installation**

**Model Selection Guide**

The model and the quantity having the optimum impact force are selected according to the type, shape, scale and application. For instance, when installing on the conical hopper of 48” dia., 0.125” thick, find the point of intersection according to the figure on the right. If the point is within the range of KNR-40 2 nos. and KNR-60 2 nos, select KNR-40 2 nos, for small clinging strength, and KNR-60 2 nos, for large clinging strength.

**Caution On Operating**

The larger conical and pyramid hoppers collect more material and may require multiple knockers. Choose smaller knockers in these cases.

**INSTALLING POSITION**

1. Prepare/weld reinforcing plate
2. Weld around the whole circumference of the base
3. For the model larger than KNR-60, weld reinforcing rib (usually unnecessary for KNR-3D and KNR-4D)
4. Tighten the body thoroughly, using bolt, spring washer, and lock nut
5. To prevent Knocker from dropping, secure with wire rope assembly

**Control Method**

- **When using with three-way solenoid valve**
- **When using with three-way solenoid valve**
- **When using the HKA, EKE exclusive control panel**
- **When using the HKA, EKE exclusive control panel**
- **When using the air operation controller AOC-1B**
- **When using the air operation controller AOC-1B**

**Selection of Extension Tube**

Extension tube from solenoid valve to control panel uses nylon tube of outside diameter 5/16” and inside diameter 1/4”.

**Maximum Tube Length (ft) between AOC-1B and Knocker Length of Relay Tube in Relay System Piping and Air Pressure**

<table>
<thead>
<tr>
<th>Model (KNR)</th>
<th>Tube Length (ft)</th>
<th>Maximum Pressure (PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-SS / 15-F</td>
<td>9.75</td>
<td>80 or below</td>
</tr>
<tr>
<td>20-SS / 20-F</td>
<td>16.5</td>
<td>100 or below</td>
</tr>
<tr>
<td>30 / 30-SS / 30-DI</td>
<td>32.75</td>
<td>100 or below</td>
</tr>
<tr>
<td>40 / 40-SS / 40-DI</td>
<td>44 or below</td>
<td>125 or below</td>
</tr>
<tr>
<td>80 / 80-DI</td>
<td>58 or below</td>
<td>150 or below</td>
</tr>
<tr>
<td>100 / 100-DI</td>
<td>73 or below</td>
<td>160 or below</td>
</tr>
</tbody>
</table>

**Length of Relay Tube in Relay System Piping and Air Pressure**

<table>
<thead>
<tr>
<th>Model (KNR)</th>
<th>Tube Length (ft)</th>
<th>Working Pressure (PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 / 30-SS / 30-DI</td>
<td>32.75</td>
<td>150 or below</td>
</tr>
<tr>
<td>40 / 60-DI / 60-DI</td>
<td>73 or below</td>
<td>160 or below</td>
</tr>
<tr>
<td>80 / 80-DI</td>
<td>80 or below</td>
<td>175 or below</td>
</tr>
<tr>
<td>100 / 100-DI</td>
<td>94 or below</td>
<td>200 or below</td>
</tr>
</tbody>
</table>

**Use of Air Deflation**

Air deflation is recommended for installation of reinforcing plate and rib. Perform piping not to exceed the border line shown in the following figure.
THE POWDER DISCHARGE SPECIALISTS

Providing pneumatic products and services worldwide to more than 80 countries