Power Jacks have taken time, engineering excellence and the best people to produce the ultra compact Neeter Drive gearbox.

Our expertise has been built on a history of engineering craftsmanship and design dating back to 1903. The facility in Scotland is the UK’s largest screw jack and spiral bevel gearbox manufacturing facility, that uses the latest engineering technologies to deliver quality products (BS EN ISO 9001:2008) that offer reliability, performance and economy.

Power Jacks is synonymous with screw jack technology and its development. We have been involved with Screw Jacks since the product was invented in the late 1930’s and this gives us unparalleled experience in the design and manufacture of both standard and special designs.

In 2004 Power Jacks acquired Neeter Drive the UK’s largest spiral bevel gearbox manufacturer with over 40 years of knowledge and experience in the supply of both standard and special designs. Neeter Drive today is a Power Jacks technology that is focused on delivering the best bevel gearbox solution for the customer.

Complimenting the screw jacks and bevel gearboxes the Power Jacks portfolio also includes the design and manufacture of electric linear actuators and planetary roller screws. This enables us to offer our customers a complete linear motion and power transmission system and solution.

We know our customers demand our engineering expertise to help find a solution for their applications. We take pride in designing and delivering the best solution. This is what defines the Power Jacks range.
Range-N Ultra Compact

Features ..............................................................................................6
Configurations ....................................................................................8
Product Code ......................................................................................9
Selection Process .............................................................................10
Performance .....................................................................................12
Torque & Power Rating .....................................................................13
Permissible Shaft Loading ...............................................................16

The Range

Series 35
Ratio 1:1 & 1.5:1................................................................................20
Ratio 2:1 & Above..............................................................................22
Ratio All.............................................................................................24

Series 37
Ratio 1:1 & 1.5:1................................................................................26
Ratio 2:1 & Above..............................................................................28
Ratio All.............................................................................................30

Series 38
Ratio 1:1 & 1.5:1................................................................................32
Ratio 2:1 & Above..............................................................................34
Ratio All.............................................................................................36

Series 39
Ratio 1:1 & 1.5:1................................................................................38
Ratio 2:1 & Above..............................................................................40
Ratio All.............................................................................................42

Series 40
Ratio 1:1 & 1.5:1................................................................................44
Ratio 2:1 & Above..............................................................................46
Ratio All.............................................................................................48

Series 42
Ratio 1:1 & 1.5:1................................................................................50
Ratio 2:1 & Above..............................................................................52
Ratio All.............................................................................................54

Accessories/Options
Motor Adaptors .................................................................................56
Options..............................................................................................57
Custom Applications .........................................................................58
Other Power Jacks Products............................................................59
Introducing the Range-N Neeter Drive bevel gearbox range from Power Jacks, an ultra compact and versatile design.

Created by a team of experienced design engineers, the focus was to provide our customers with a ultra compact bevel gearbox that offers versatility in design. In addition to this, we wanted to design a bevel gearbox that had the perfect combination of excellent performance, a long lasting service life, durability and the flexibility to be engineered for the most demanding applications.

Perfect for industrial applications or the extreme such as subsea, defence or nuclear.

**Standard Gearbox**
- 6 Gearbox Sizes
  - 35, 37, 38, 39, 40, 42 Series
- 16 Gearbox Configurations
- Gear Ratios:
  - 1:1, 1.5:1, 2:1, 3:1 and 4:1*
  - Special gear ratios available on request e.g. 1.25:1
- *No 4:1 on Series-35
- Power Ratings: 0.1 - 226 kW
- Torque Ratings: 15 Nm - 7000Nm

**Gearbox Housing**
A rugged Ultra Compact design made from a highly durable SG Iron. This provides a strong housing that firmly and accurately holds the gear set in a reservoir of quality lubricant suited to the most industrial demands.

**Corrosion Protection**
To suit all economic needs.
- Standard Industrial Paint Finish
- Arduous Environment Paint Finish
- Customer Specified Paint
- Plated Finish
- Stainless Steel

**Reliable Spiral Bevel Gear**
With a proven design already used in millions of gearboxes, the Precision Spiral Bevel Gears with accurate gear mesh delivers high torque with smooth and quiet transmission.

**Superior Gear and Shaft Support**
For gear ratios 1:1 and 1.5:1 where each gear has a bearing support on both sides. This gives optimum gear support and minimises bearing hub sizes for non-through shaft configurations.

**Shaft Configurations**
- 2, 3 or 4-way
- Solid or hollow shaft
- Special configurations available
- Motor Adapter to bolt an IEC motor directly to the gearbox input
- Service life of 10,000 hours for all gearbox sizes
- Input Speed up to 3000 rpm maximum
- Breather / vents available for high speed designs
Main Mounting Method by 4 tapped bolt holes on 2 sides of the gearbox (top and bottom)

Oil plug / filler located on multiple gearbox faces (2 as standard)

Bearings
All shafts are carried on high quality taper roller bearings

Precision Spiral Bevel Gears

Oil Seals for all exposed shafts

Gear has a bearing support on both sides for optimum gear support

Shafts with Tapped Holes to allow the easy fitment and removal of couplings

Closed Keyways on all solid drive shaft ends with keys supplied

www.powerjacks.com
# Range-N Configurations

## Basic Range Overview

<table>
<thead>
<tr>
<th>Series</th>
<th>35</th>
<th>37</th>
<th>38</th>
<th>39</th>
<th>40</th>
<th>42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (kW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Torque M2 (Nm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shaft Diameter (mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on Ratio 1:1, 3way solid shaft, Gear Unit Size
Each Neeter Drive Gear Unit is allocated a Part Number which defines the unit specification. For identification purposes this number is stamped on each unit.

The above chart outlines the Part Numbering System. It should be noted that as Neeter Drive’s range of units has developed over the years, certain features are not applicable to the current range.

**Notes:**
* Non Standard feature  
** Not available on Series 35  
† Reverse/Reversible Configuration  

The reverse configuration is the way in which the output shaft rotates. The Reversible unit has a hand wheel on the unit so the output shaft direction of rotation can be changed when stationary.
How to Select a Neeter Drive Unit

When selecting a gearbox, there are a number of factors which can influence the final size of unit selected. The information contained in the selections gearbox characteristics and Technical data provide details of these factors for use in the selection process.

The following Selection Procedure provides a step-by-step guide to gearbox selection for those not fully familiar with the procedures. An example has been used in the selection procedure to assist in following through the procedure.

<table>
<thead>
<tr>
<th>Specified information</th>
<th>Example Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gearbox Input Speed (rpm)</td>
<td>1000</td>
</tr>
<tr>
<td>2. Gearbox Output Speed (rpm)</td>
<td>500</td>
</tr>
<tr>
<td>3. Gearbox Configuration (page 17)</td>
<td>2 Way (2)</td>
</tr>
<tr>
<td>4. Required Output Torque (Nm)</td>
<td>150</td>
</tr>
<tr>
<td>5. Operating Hours per Day (HRS)</td>
<td>10</td>
</tr>
<tr>
<td>6. Input Power Source (page 14)</td>
<td>Electric Motor</td>
</tr>
<tr>
<td>7. Gearbox Application (page 14)</td>
<td>Stacking Machine</td>
</tr>
<tr>
<td>8. Number of Starts per Hour (page 14)</td>
<td>8</td>
</tr>
<tr>
<td>10. Duty Cycle per Hour (% Running time)</td>
<td>45/60 = 75%</td>
</tr>
<tr>
<td>11. Operating Ambient Temperature °C (page 15)</td>
<td>20</td>
</tr>
</tbody>
</table>

Selection of Design Factors

<table>
<thead>
<tr>
<th>Example Design Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 - Shock Load Factor (f_1) Using the Specified Information in Points 5, 6 and 7 above, select the Shock Load Factor from the Page 14.</td>
</tr>
<tr>
<td>Step 2 - Starting Frequency Factor (f_2) Using the Specified Information in Point 8 above, select the Starting Frequency Factor from the page 14.</td>
</tr>
<tr>
<td>Step 3 - Transmission Load Factor (f_3) Using the Specified Information in Point 9 above, select the Transmission Load Factor from the Page 14.</td>
</tr>
<tr>
<td>Step 4 - Thermal Limit - Duty Cycle - Factor (f_4) Using the Specified Information in Point 10 above, select the Thermal Limit - Duty Cycle - Factor from the Page 14.</td>
</tr>
<tr>
<td>Step 5 - Thermal Limit- Ambient Temperature - Factor (f_5) Using the Specified Information in Point 11 above, select the Thermal Limit - Ambient Temperature -Factor from the Page 15.</td>
</tr>
</tbody>
</table>
A gearbox is required for an Input Speed of 1000 rpm, an Output Speed of 500 rpm, an Output Torque of 150Nm and one Output Shaft. The Drive is by electric motor through a clutch mechanism and the gearbox is on the main drive of a heavy duty stacking machine. The machine operates for 10 hours per day, starts 8 times per hour and operates for 45 minutes in every hour, the other 15 minutes being taken up in loading the machine. The ambient temperature of the premises is 20°C.

### Step 6 - Calculate the Gear Ratio

\[
\text{Input Speed} \div \text{Output Speed}
\]

Note: If the gear ratio does not correspond to one of the STANDARD ratios contained in this technical manual, one of the speeds, normally the output speed, must be changed to bring the ratio to standard. Non-standard ratios can be supplied, if required, but such special selections must be referred to Power Jacks.

\[
1000/500 = 2
\]

Therefore 2:1 Reduction

### Step 7 - Calculate the Corrected Output Torque

\[
\text{Required Output Torque} \times f_1 \times f_2 \times f_3
\]

Note: Where there is more than one output shaft, the Required Output Torque for the gearbox is the summation of the individual Output Torques from the output shafts.

\[
150 \times 1.25 \times 1.00 \times 1.00 \times = 187.5 \text{ Nm}
\]

### Step 8 - Calculate the Corrected Output Power

\[
\frac{\text{Required Output Torque} \times \text{Output Speed}}{9550}
\]

\[
\frac{(187.5 \times 500)}{9550} = 9.82 \text{ kW}
\]

### Step 9 - Calculate the Required Input Power = Output Power / Efficiency [Gearbox efficiency is between 95% and 98% after initial running in].

\[
9.82 / 0.98 = 10.02 \text{ kW}
\]

### Gearbox Selection

- **Step 10** - From the GEARBOX TORQUE x POWER RATING TABLE (page 13), select the gearbox with the closest adequate rated power.

- **Step 11** - When selecting a gearbox, the Thermal Capacity of the gearbox chosen must be considered. For the Limiting Thermal Capacity [page 15], expressed as a Power Rating. For the selected gearbox, calculate the Thermal Capacity = Limiting Thermal Capacity x \( f_4 \times f_5 \).

The Calculated Input Power must not exceed this Calculated Thermal Capacity. A larger gearbox must be selected if the Calculated Input Power is higher and a check run on the other parameters.

- **Step 12** - As a final check on the capacity of the chosen gearbox, the effect of the connected drive systems must be considered. The section headed Permissible Shaft Loading [page 16] describes the calculation to be undertaken where the transmission mechanism can give rise to radial and/or axial forces on the gear shafts. This occurs, particularly, where chain and belt drives are employed.

### Example Gearbox Selection

- From the Selection Table on page 13, for Input Power 10.02 kW, gear ratio 2:1 and Input Speed 1000 rpm, select Series 39.

- From the table in page 15, Limiting Thermal Capacity for Series 39 is 49kW.

Calculate the gearbox,

\[
\text{Thermal Capacity} = 49 \times 1.25 \times 1.00 = 61.25 \text{ kW}
\]

The Input Power is within this limit. Selected gearbox is OK.

Power transmission is by clutch. From the Transmission Load Factor table (page 14 \( f_3 \)), there are no additional loads to be considered and the selection of gearbox is acceptable.
Range-N
Performance

<table>
<thead>
<tr>
<th>Series</th>
<th>35</th>
<th>37</th>
<th>38</th>
<th>39</th>
<th>40</th>
<th>42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque [Nm]</td>
<td>Nominal#1</td>
<td>46</td>
<td>115</td>
<td>328</td>
<td>481</td>
<td>1353</td>
</tr>
<tr>
<td></td>
<td>Max Running#2</td>
<td>93</td>
<td>187</td>
<td>505</td>
<td>935</td>
<td>3088</td>
</tr>
<tr>
<td></td>
<td>Max Start-Up</td>
<td>140</td>
<td>281</td>
<td>758</td>
<td>1403</td>
<td>4632</td>
</tr>
<tr>
<td>Input Speed</td>
<td>Max (rpm)</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
</tr>
<tr>
<td></td>
<td>Input Speed</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
</tr>
<tr>
<td></td>
<td>Thermal Limit</td>
<td>Power [kW]</td>
<td>3.3</td>
<td>9</td>
<td>20.5</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Backlash</td>
<td>arcm</td>
<td>9 to 16</td>
<td>9 to 16</td>
<td>9 to 16</td>
<td>7 to 10</td>
</tr>
<tr>
<td></td>
<td>Efficiency [%]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>95% - 98%</td>
</tr>
<tr>
<td>Service Life</td>
<td>(hours)</td>
<td>&gt;10000</td>
<td>&gt;10000</td>
<td>&gt;10000</td>
<td>&gt;10000</td>
<td>&gt;10000</td>
</tr>
<tr>
<td>Oil Quantity</td>
<td>Litres</td>
<td>0.14</td>
<td>0.29</td>
<td>0.75</td>
<td>1.71</td>
<td>3.27</td>
</tr>
<tr>
<td></td>
<td>Pints</td>
<td>0.24</td>
<td>0.5</td>
<td>1.32</td>
<td>3</td>
<td>5.75</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Way - 1:1 &amp; 1.5:1</td>
<td>4.5</td>
<td>10.5</td>
<td>20</td>
<td>38</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>2 Way - 2:1 +</td>
<td>6.5</td>
<td>12</td>
<td>23</td>
<td>45</td>
<td>126.5</td>
</tr>
<tr>
<td></td>
<td>3 Way - 1:1 &amp; 1.5:1</td>
<td>4.75</td>
<td>11</td>
<td>20.5</td>
<td>46.5</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>3 Way - 2:1 +</td>
<td>6.75</td>
<td>12.5</td>
<td>23.5</td>
<td>53</td>
<td>131</td>
</tr>
</tbody>
</table>

The above tables and other torque & power tables are on the basis of the following nominal values:

1. Shock-free operation
2. Operating time per day = 8 hours
3. Maximum 20 starts per hour (torque x 1.5 permissible)
4. Duty cycle 100%
5. When selecting gearboxes take the thermal capacity into consideration
6. Ambient temperature for operation -10° to +50°C permissible

Notes:

#1 Nominal torque values at running speeds of 1500 rpm

#2 Maximum running torque value at speed of 10 rpm

**Lubrication**

The oil levels stated in the table above assumes that the gearbox is positioned with all shafts in a horizontal plane. To get the correct lubrication recommendation please supply shaft orientation and operating speeds required as part of the application details provided to Power Jacks with an enquiry.

All Neeter Drive Range-N gearboxes are shipped without lubrication, except for grease filled units.

Input Speeds: 250 rpm < n

For input speeds below 250 rpm then a grease filled gearbox is recommended.

**Oil Specification**

<table>
<thead>
<tr>
<th>Ambient Temperature</th>
<th>Gear Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below +5°C</td>
<td>ISO 150</td>
</tr>
<tr>
<td>+5°C to +40°C</td>
<td>ISO 220</td>
</tr>
<tr>
<td>Above +40°C</td>
<td>ISO 320</td>
</tr>
</tbody>
</table>

Input Speeds: 250 rpm < n < 1500 rpm

For input speeds up to 1500 rpm the oil level in the gearbox should be maintained just below the centre line of the shafts.

Input Speeds: n > 1500 rpm

For input speeds above 1500 rpm a change in oil level may be required in combination with a breather (vent). Consult Power Jacks for specific application advice.

**Grease Specification**

Use an EP1 rated grease.
## Torque and Power Rating

<table>
<thead>
<tr>
<th>Gear</th>
<th>Input Torque M2 (Nm)</th>
<th>Power (kW)</th>
<th>Gears Unit Size</th>
<th>Ratio</th>
<th>10</th>
<th>50</th>
<th>100</th>
<th>250</th>
<th>500</th>
<th>750</th>
<th>1000</th>
<th>1500</th>
<th>2000</th>
<th>2500</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Series 35</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1:1</td>
<td>0.2</td>
<td>1</td>
<td>2</td>
<td>4.3</td>
<td>7.7</td>
<td>10.8</td>
<td>13.6</td>
<td>18.5</td>
<td>22.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.5:1</td>
<td>0.1</td>
<td>0.5</td>
<td>0.8</td>
<td>1.9</td>
<td>3.5</td>
<td>5.6</td>
<td>8.5</td>
<td>11.5</td>
<td>14.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2:1</td>
<td>0.1</td>
<td>0.3</td>
<td>0.6</td>
<td>1.3</td>
<td>2.5</td>
<td>3.7</td>
<td>4.9</td>
<td>6.6</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3:1</td>
<td>0.01</td>
<td>0.07</td>
<td>0.13</td>
<td>0.23</td>
<td>0.35</td>
<td>0.5</td>
<td>0.7</td>
<td>0.9</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Output Torque M2 (Nm)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1:1</td>
<td>187</td>
<td>187</td>
<td>187</td>
<td>144</td>
<td>134</td>
<td>127</td>
<td>115</td>
<td>105</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.5:1</td>
<td>140</td>
<td>140</td>
<td>112</td>
<td>106</td>
<td>98</td>
<td>93</td>
<td>89</td>
<td>84</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2:1</td>
<td>187</td>
<td>112</td>
<td>112</td>
<td>97</td>
<td>93</td>
<td>87</td>
<td>84</td>
<td>79</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3:1</td>
<td>84</td>
<td>61</td>
<td>56</td>
<td>56</td>
<td>44</td>
<td>44</td>
<td>42</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4:1</td>
<td>37</td>
<td>44</td>
<td>37</td>
<td>29</td>
<td>29</td>
<td>29</td>
<td>28</td>
<td>28</td>
<td>28</td>
</tr>
</tbody>
</table>

- **Series 37**
- **Series 38**
- **Series 39**
- **Series 40**
- **Series 42**

**Check Thermal Limit - Power**

**Check Thermal Limit - Torque**

**Power Ratings (kW) & given INPUT speeds (rpm)**

Output Torque M2 (Nm) @ given INPUT speeds (rpm)

---

**Range-N**

Torque & Power Rating
## Shock Load Factor \( f_1 \)

<table>
<thead>
<tr>
<th>Shock Load Category</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conveyor Belts</td>
<td>Heavy Duty Lifts</td>
<td>Punching Machine</td>
<td></td>
</tr>
<tr>
<td>Generators</td>
<td>Hoists</td>
<td>Shears</td>
<td></td>
</tr>
<tr>
<td>Ventilators</td>
<td>Mixers</td>
<td>Forging Presses</td>
<td></td>
</tr>
<tr>
<td>Light Textile Machinery</td>
<td>Cranes</td>
<td>Vibrators</td>
<td></td>
</tr>
<tr>
<td>Rotating Machine Tools</td>
<td>Heavy Duty Textile Machinery</td>
<td>Rolling Mills</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Woodworking Machinery</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paper Machinery</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Input Power Source

<table>
<thead>
<tr>
<th>Shock Load Category</th>
<th>Electric Motor</th>
<th>Piston Machine Hydro Motor</th>
<th>Single Cylinder Piston Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Operating Time per Day (hrs)</td>
<td>Operating Time per Day (hrs)</td>
<td>Operating Time per Day (hrs)</td>
</tr>
<tr>
<td></td>
<td>≤2</td>
<td>10</td>
<td>&gt;10</td>
</tr>
<tr>
<td>I</td>
<td>0.9</td>
<td>1</td>
<td>1.25</td>
</tr>
<tr>
<td>II</td>
<td>1</td>
<td>1.25</td>
<td>1.5</td>
</tr>
<tr>
<td>III</td>
<td>1.5</td>
<td>1.75</td>
<td>2</td>
</tr>
</tbody>
</table>

## Starting Frequency Factor \( f_2 \)

- up to 20 starts per hour \( f_2 = 1.0 \)
- up to 60 starts per hour \( f_2 = 1.1 \)
- up to 200 starts per hour \( f_2 = 1.3 \)
- up to 600 starts per hour \( f_2 = 1.5 \)
- more than 600 starts per hour (on request)

## Transmission Load Factor \( f_3 \)

The total load on the drive shafts and their bearing is the result of:

a. The loads arising from the gear teeth  
b. The axial and radial loads arising from the transmission mechanisms attached to the drive shafts. It is this load which must be considered when selecting the gearbox and shaft sizes.

Depending upon the type of transmission mechanism used in connecting the gear shafts to the driving and driven loads, axial and/or radial loads can be applied to the gearbox shafts and their bearings.

These loads can arise from:

- either preload, due for example, to tension loading in belts  
- or dynamic forces, due for example, to out-of-balance in the transmission element  
- or shock load, due for example, to snatching in a chain drive.

The following table gives the factors which should be used to correct the Output Torque when sizing the gearbox.

<table>
<thead>
<tr>
<th>Transmission Load Factor ( f_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission Mechanism</td>
</tr>
<tr>
<td>Clutches</td>
</tr>
<tr>
<td>Gears of all Types</td>
</tr>
<tr>
<td>Chains</td>
</tr>
<tr>
<td>Flat Belts</td>
</tr>
<tr>
<td>V-Belts, Toothed Belts</td>
</tr>
</tbody>
</table>
Thermal Limits

Due to the compact design of this range of spiral bevel gear units the ratings are controlled by the thermal capacity at some speeds. A maximum case temperature of 80°C is specified and temperatures in excess of this figure normally indicate either incorrect oil levels or too much power being handled by the unit. If this temperature is exceeded Power Jacks should be consulted.

Thermal Limit - Duty Cycle - Factor ($f_4$)

Duty cycle per hour is the percentage of the time per hour during which the gearbox will be on-load.

<table>
<thead>
<tr>
<th>Duty Cycle per Hour (%)</th>
<th>100</th>
<th>80</th>
<th>60</th>
<th>40</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Limit Factor, $f_4$</td>
<td>1</td>
<td>1.25</td>
<td>1.5</td>
<td>1.75</td>
<td>2</td>
</tr>
</tbody>
</table>

Thermal Limit - Ambient Temperature - Factor ($f_5$)

Ambient Temperature °C | 10 | 20 | 30 | 40 | 50 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Limit Factor, $f_5$</td>
<td>1.2</td>
<td>1</td>
<td>0.87</td>
<td>0.75</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Limiting Thermal Capacity

The capacity of some gears is limited by the maximum permissible temperature of the oil bath. The charts below show the limiting thermal capacities, which can be transferred without cooling at an ambient temperature of 20°C and duty cycle of 100% per hour.

<table>
<thead>
<tr>
<th>Series</th>
<th>35</th>
<th>37</th>
<th>38</th>
<th>39</th>
<th>40</th>
<th>42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (kW)</td>
<td>3.3</td>
<td>9</td>
<td>20.5</td>
<td>49</td>
<td>98</td>
<td>190</td>
</tr>
</tbody>
</table>

WARNING: The case temperature must not exceed 80°C, (see thermal limits). Power Jacks should be consulted if a gear unit is to be installed with a shaft positioned vertically.
Permissible Shaft Loading

After selecting the gearbox for the required duty it is necessary to check that the axial and radial loading arising from the transmission mechanism is acceptable for the gear shaft diameters on the selected gearbox (gear shaft diameters are given on the Dimensions page for the chosen design).

The bearing configuration on the shafting, the shaft diameter and the shaft speed determine the permissible external loading which can be carried by the shaft without bearing or shaft failure. The graph showing permissible radial forces on shafts has been drawn for a typical Output Shaft. In this arrangement the bearing centres are mounted at either end of the through shaft and there is a significant span which allows higher radial loads to be accepted, see sketch below. For typical Input Shafts and Output Shafts, which are overhung from the gearbox face, the bearing centres are closer together and the radial load carrying capacity is reduced, see sketch below.

To calculate the Permissible Loading on the gearbox shafts, use the gearbox output and input speeds and diameters respectively.

1. Read off the Permissible radial Force for the nearest diameter shafts from the graph below.
2. Use the Correction Factors, below, to calculate the Permissible Radial and Axial Loads for each of the gearbox shafts.

Correction Factors

<table>
<thead>
<tr>
<th></th>
<th>Output Shaft (Bearings on through shaft)</th>
<th>Input Shaft (Bearings on overhung shaft)</th>
<th>Output Shaft (Bearings on overhung shaft)</th>
<th>Gearboxes with Centre bearing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible Radial Forces</td>
<td>1.00</td>
<td>0.66</td>
<td>0.66</td>
<td>0.40</td>
</tr>
<tr>
<td>Permissible Axial Forces</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
</tr>
</tbody>
</table>

The calculated loads should be checked against the radial and axial loads provided by the manufacturer of the transmission mechanism. If the loading created by the transmission mechanism exceeds the permissible level, a gearbox with a larger diameter shaft is required. At this point Power Jacks should be consulted as it is often possible to fit a special shaft arrangement into a standard gearbox.

Example: Series 39, Ratio 2:1, 1440 rpm Input

| Ød1 = 48 | permissible radial force 7500 N x 0.66 = 4950 N |
|         | permissible axial force 4950 N x 0.50 = 2475 N |

| Ød2 = 48 | permissible radial force 9000 N x 1.00 = 9000 N |
|         | permissible axial force 9000 N x 0.50 = 4500 N |
Configuration/Rotation Diagrams

Ratio 1:1 & 1.5:1

2 (2 Way)  5 (2 Way Reverse)  3 (3 Way)  4 (3 Way Reverse)  7 (4 Way)

Ratio 2:1 & Above

2 (2 Way)  5 (2 Way Reverse)  3 (3 Way)  4 (3 Way Reverse)  7 (4 Way)

Hollow Shaft - All Ratios

K (2 Way)  L (2 Way Reverse)  0 (3 Way)  J (4 Way)
Ultra Compact & Versatile Design. Precision Spiral Bevel Gears. Accurate gear mesh delivers high torque with smooth and quiet transmission.
Ultra Compact & Versatile Design.

Precision Spiral Bevel Gears.

Accurate gear mesh delivers high torque with smooth and quiet transmission.
**Range-N**  
**Series 35**  
**Ratio 1:1 & 1.5:1**

### Performance

<table>
<thead>
<tr>
<th>Torque (Nm)</th>
<th>Nominal#1</th>
<th>46</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Max Running#2</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>Max Start-Up</td>
<td>140</td>
</tr>
<tr>
<td>Input Speed</td>
<td>Max (rpm)</td>
<td>3000</td>
</tr>
<tr>
<td>Thermal Limit</td>
<td>Power (kW)</td>
<td>3.3</td>
</tr>
<tr>
<td>Backlash</td>
<td>arcmin</td>
<td>9 to 16</td>
</tr>
<tr>
<td>Efficiency</td>
<td>(%)</td>
<td>95% - 98%</td>
</tr>
<tr>
<td>Service Life</td>
<td>(hours)</td>
<td>&gt;10000</td>
</tr>
<tr>
<td>Housing Material</td>
<td></td>
<td>SG Iron</td>
</tr>
<tr>
<td>Oil Quantity</td>
<td>Litres</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>Pints</td>
<td>0.24</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>2 Way - 1:1 &amp; 1.5:1</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>3 Way - 1:1 &amp; 1.5:1</td>
<td>4.75</td>
</tr>
</tbody>
</table>

**Notes:**  
#1 Nominal torque values at running speeds of 1500 rpm  
#2 Maximum running torque value at speed of 10 rpm  
Full detailed performance for each unit refer to page 12 & 13

### Accessories & Options

- **Special Gear Ratio**
- **Motor Flange**
- **Extended Drive Shaft**
- **Limit Switches**
- **Drives**
- **Light Weight Design**
- **Reinforced Shaft OR High Torque**
- **Breather**
- **90° Breather**
- **Mounting Feet**
- **Shaft Cover**
- **Stainless Steel**
- **Submersible**
- **Corrosion Protection**
- **Nuclear Rated**
- **Food Grade**
- **Low Temperature**
- **High Temperature**

**2 Way Solid Shaft**

**35241M**

- 4 Mounting Holes on Sides 5 and 6, M8 x 12 Deep
- Tapped hole in end of each solid drive shaft - M6 x 16mm Deep

**Notes:**  
1. All dimensions in mm unless otherwise stated  
2. Dimensions subject to change without notice

---

www.powerjacks.com
Range-N
Series 35
Ratio 1:1 & 1.5:1

3 Way Solid Shaft
35341M

4 Way Solid Shaft
35741M

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

Tapped hole in end of each solid drive shaft - M6 x 16mm Deep

Oil Plug

6 x 6 x 36 (keyway) 2

Oil Plug

4 Mounting Holes on Sides 5 and 6, M8 x 12 Deep

Oil Plug

6 x 6 x 36 (keyway) 2

Oil Plug

4 Mounting Holes on Sides 5 and 6, M8 x 12 Deep

Oil Plug

6 x 6 x 36 (keyway) 2

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
### Performance

<table>
<thead>
<tr>
<th></th>
<th>Series 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque (Nm)</td>
<td>Nominal#1 46</td>
</tr>
<tr>
<td></td>
<td>Max Running#2 93</td>
</tr>
<tr>
<td></td>
<td>Max Start-Up 140</td>
</tr>
<tr>
<td>Input Speed (rpm)</td>
<td>Max 3000</td>
</tr>
<tr>
<td>Thermal Limit (kW)</td>
<td>3.3</td>
</tr>
<tr>
<td>Backlash (arcmin)</td>
<td>9 to 16</td>
</tr>
<tr>
<td>Efficiency (%)</td>
<td>95% - 98%</td>
</tr>
<tr>
<td>Service Life (hours)</td>
<td>&gt;10000</td>
</tr>
<tr>
<td>Housing Material</td>
<td>SG Iron</td>
</tr>
<tr>
<td>Oil Quantity (Litres)</td>
<td>0.14</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>2 Way - 2:1 + 6.5</td>
</tr>
<tr>
<td></td>
<td>3 Way - 2:1 + 6.75</td>
</tr>
</tbody>
</table>

Notes:
- #1 Nominal torque values at running speeds of 1500 rpm
- #2 Maximum running torque value at speed of 10 rpm
- Full detailed performance for each unit refer to page 12 & 13

### Accessories & Options

- Special Gear Ratio
- Motor Flange
- Extended Drive Shaft
- Limit Switches
- Drives
- Light Weight Design
- Reinforced Shaft OR High Torque
- Breather
- 90° Breather
- Mounting Feet
- Shaft Cover
- Stainless Steel
- Submersible
- Corrosion Protection
- Nuclear Rated
- Food Grade
- Low Temperature
- High Temperature

### 2 Way Solid Shaft

#### 35242M

- 4 Mounting Holes on Sides 5 and 6, M8 x 12 Deep
- Tapped hole in end of each solid drive shaft - M6 x 16mm Deep
- Oil Plug
- 6 x 6 x 36

Notes:
- 1. All dimensions in mm unless otherwise stated
- 2. Dimensions subject to change without notice
Range-N
Series 35
Ratio 2:1 & above

3 Way Solid Shaft

35342M

4 Way Solid Shaft

35742M

Tapped hole in end of each solid drive shaft - M6 x 16mm Deep

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
Performance

<table>
<thead>
<tr>
<th>Torque (Nm)</th>
<th>Series 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal#1</td>
<td>46</td>
</tr>
<tr>
<td>Max Running#2</td>
<td>93</td>
</tr>
<tr>
<td>Max Start-Up</td>
<td>140</td>
</tr>
<tr>
<td>Input Speed</td>
<td>Max (rpm)</td>
</tr>
<tr>
<td>Thermal Limit</td>
<td>Power (kW)</td>
</tr>
<tr>
<td>Backlash</td>
<td>arcmin</td>
</tr>
<tr>
<td>Efficiency</td>
<td>(%)</td>
</tr>
<tr>
<td>Service Life</td>
<td>(hours)</td>
</tr>
<tr>
<td>Housing Material</td>
<td></td>
</tr>
<tr>
<td>Oil Quantity</td>
<td>Litres</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>2 Way - 1:1 &amp; 1:5:1</td>
</tr>
<tr>
<td></td>
<td>2 Way - 2:1</td>
</tr>
<tr>
<td></td>
<td>3 Way - 1:1 &amp; 1:5:1</td>
</tr>
<tr>
<td></td>
<td>3 Way - 2:1</td>
</tr>
</tbody>
</table>

Notes:
#1 Nominal torque values at running speeds of 1500 rpm  
#2 Maximum running torque value at speed of 10 rpm  
Full detailed performance for each unit refer to page 12 & 13

2 Way Hollow Shaft

35K41M

Notes:
1. All dimensions in mm unless otherwise stated  
2. Dimensions subject to change without notice
Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
Range-N
Series 37
Ratio 1:1 & 1.5:1

Performance

<table>
<thead>
<tr>
<th>Series 37</th>
<th>Torque (Nm)</th>
<th>Nominal#1</th>
<th>115</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Max Running#2</td>
<td>187</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max Start-Up</td>
<td>281</td>
<td></td>
</tr>
<tr>
<td>Input Speed</td>
<td>Max (rpm)</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Thermal Limit</td>
<td>Power (kW)</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Backlash</td>
<td>arcmin</td>
<td>9 to 16</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>(%)</td>
<td>95% - 98%</td>
<td></td>
</tr>
<tr>
<td>Service Life</td>
<td>(hours)</td>
<td>&gt;10000</td>
<td></td>
</tr>
<tr>
<td>Housing Material</td>
<td>SG Iron</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil Quantity</td>
<td>Litres</td>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pints</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>2 Way - 1:1 &amp; 1.5:1</td>
<td>10.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Way - 1:1 &amp; 1.5:1</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

#1 Nominal torque values at running speeds of 1500 rpm
#2 Maximum running torque value at speed of 10 rpm
Full detailed performance for each unit refer to page 12 & 13

Accessories & Options

- Special Gear Ratio
- Motor Flange
- Extended Drive Shaft
- Limit Switches
- Drives
- Light Weight Design
- Reinforced Shaft OR High Torque
- Breather
- 90° Breather
- Mounting Feet
- Shaft Cover
- Stainless Steel
- Submersible
- Corrosion Protection
- Nuclear Rated
- Food Grade
- Low Temperature
- High Temperature

2 Way Solid Shaft

37241M

Notes:

1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
3 Way Solid Shaft

37341M

4 Way Solid Shaft

37741M

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
Range-N
Series 37
Ratio 2:1 & above

Performance

<table>
<thead>
<tr>
<th></th>
<th>Series 37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque (Nm)</td>
<td>Nominal#1 115</td>
</tr>
<tr>
<td></td>
<td>Max Running#2 187</td>
</tr>
<tr>
<td></td>
<td>Max Start-Up 281</td>
</tr>
<tr>
<td>Input Speed</td>
<td>Max (rpm) 3000</td>
</tr>
<tr>
<td>Thermal Limit</td>
<td>Power (kW) 9</td>
</tr>
<tr>
<td>Backlash</td>
<td>arcmin 9 to 16</td>
</tr>
<tr>
<td>Efficiency</td>
<td>% 95% - 98%</td>
</tr>
<tr>
<td>Service Life</td>
<td>(hours) &gt;10000</td>
</tr>
<tr>
<td>Housing Material</td>
<td>SG Iron</td>
</tr>
<tr>
<td>Oil Quantity</td>
<td>Litres 0.29</td>
</tr>
<tr>
<td></td>
<td>Pints 0.5</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>2 Way - 2:1 + 12</td>
</tr>
<tr>
<td></td>
<td>3 Way - 2:1 + 12.5</td>
</tr>
</tbody>
</table>

Notes:
#1 Nominal torque values at running speeds of 1500 rpm
#2 Maximum running torque value at speed of 10 rpm
Full detailed performance for each unit refer to page 12 & 13

Accessories & Options

- Special Gear Ratio
- Motor Flange
- Extended Drive Shaft
- Limit Switches
- Drives
- Light Weight Design
- Reinforced Shaft OR High Torque
- Breather
- 90° Breather
- Mounting Feet
- Shaft Cover
- Stainless Steel
- Submersible
- Corrosion Protection
- Nuclear Rated
- Food Grade
- Low Temperature
- High Temperature

2 Way Solid Shaft

37242M

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
Performance

<table>
<thead>
<tr>
<th>Series 37</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque (Nm)</td>
<td>Nominal#1</td>
<td>115</td>
<td>Max Running#2</td>
<td>187</td>
<td>Max Start-Up</td>
</tr>
<tr>
<td>Input Speed</td>
<td>Max (rpm)</td>
<td>3000</td>
<td>Thermal Limit</td>
<td>Power (kW)</td>
<td>9</td>
</tr>
<tr>
<td>Backlash</td>
<td>arcmin</td>
<td>9 to 16</td>
<td>Efficiency</td>
<td>(%)</td>
<td>95% - 98%</td>
</tr>
<tr>
<td>Service Life</td>
<td>(hours)</td>
<td>&gt;10000</td>
<td>Housing Material</td>
<td></td>
<td>SG Iron</td>
</tr>
<tr>
<td>Oil Quantity</td>
<td>Litres</td>
<td>0.29</td>
<td>Weight (kg)</td>
<td>2 Way - 1:1 &amp; 1:5:1</td>
<td>10.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 Way - 2:1 +</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Pints</td>
<td>0.5</td>
<td></td>
<td>3 Way - 1:1 &amp; 1:5:1</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 Way - 2:1 +</td>
<td>12.5</td>
</tr>
</tbody>
</table>

Notes:
#1 Nominal torque values at running speeds of 1500 rpm
#2 Maximum running torque value at speed of 10 rpm
Full detailed performance for each unit refer to page 12 & 13

2 Way Hollow Shaft

37K4M

Tapped hole in end of each solid drive shaft - M8 x 25mm Deep

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

Accessories & Options

- Special Gear Ratio
- Motor Flange
- Extended Drive Shaft
- Limit Switches
- Drives
- Light Weight Design
- Reinforced Shaft OR High Torque
- Breather
- 90° Breather
- Mounting Feet
- Shaft Cover
- Stainless Steel
- Submersible
- Corrosion Protection
- Nuclear Rated
- Food Grade
- Low Temperature
- High Temperature

www.powerjacks.com
3 Way Hollow Shaft

37041M

4 Way Hollow Shaft

37J41M

Tapped hole in end of each solid drive shaft - M8 x 25mm Deep

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
Range-N
Series 38
Ratio 1:1 & 1.5:1

Performance

<table>
<thead>
<tr>
<th></th>
<th>Series 38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque (Nm)</td>
<td>Nominal#1 328</td>
</tr>
<tr>
<td></td>
<td>Max Running#2 505</td>
</tr>
<tr>
<td></td>
<td>Max Start-Up 758</td>
</tr>
<tr>
<td>Input Speed (Max rpm)</td>
<td>3000</td>
</tr>
<tr>
<td>Thermal Limit (kW)</td>
<td>20.5</td>
</tr>
<tr>
<td>Backlash (arcmin)</td>
<td>9 to 16</td>
</tr>
<tr>
<td>Efficiency (%)</td>
<td>95% - 98%</td>
</tr>
<tr>
<td>Service Life (hours)</td>
<td>&gt;10000</td>
</tr>
<tr>
<td>Housing Material</td>
<td>SG Iron</td>
</tr>
<tr>
<td>Oil Quantity (Litres)</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>Pints 1.32</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>2 Way - 1:1 &amp; 1.5:1 20</td>
</tr>
<tr>
<td></td>
<td>3 Way - 1:1 &amp; 1.5:1 20.5</td>
</tr>
</tbody>
</table>

Notes:
#1 Nominal torque values at running speeds of 1500 rpm
#2 Maximum running torque value at speed of 10 rpm
Full detailed performance for each unit refer to page 12 & 13

Accessories & Options

- Special Gear Ratio
- Motor Flange
- Extended Drive Shaft
- Limit Switches
- Drives
- Light Weight Design
- Reinforced Shaft OR High Torque
- Breather
- 90° Breather
- Mounting Feet
- Shaft Cover
- Stainless Steel
- Submersible
- Corrosion Protection
- Nuclear Rated
- Food Grade
- Low Temperature
- High Temperature

2 Way Solid Shaft

38241M

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
3 Way Solid Shaft

38341M

4 Mounting Holes on Sides 5 and 6, M10 x 20 Deep

Tapped hole in end of each solid drive shaft - M10 x 25mm Deep

10 x 8 x 50 (keyway) 5

Oil Plug

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

4 Way Solid Shaft

38741M

4 Mounting Holes on Sides 5 and 6, M10 x 20 Deep

Tapped hole in end of each solid drive shaft - M10 x 25mm Deep

10 x 8 x 50 (keyway) 5

Oil Plug

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
## Performance

<table>
<thead>
<tr>
<th>Series 38</th>
<th></th>
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<tbody>
<tr>
<td>Torque (Nm)</td>
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</tr>
<tr>
<td>Nominal #1</td>
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</tr>
<tr>
<td>Max Running #2</td>
<td>505</td>
</tr>
<tr>
<td>Max Start-Up</td>
<td>758</td>
</tr>
<tr>
<td>Input Speed Max (rpm)</td>
<td>3000</td>
</tr>
<tr>
<td>Thermal Limit Power (kW)</td>
<td>20.5</td>
</tr>
<tr>
<td>Backlash arcmin</td>
<td>9 to 16</td>
</tr>
<tr>
<td>Efficiency (%)</td>
<td>95% - 98%</td>
</tr>
<tr>
<td>Service Life (hours)</td>
<td>&gt;10000</td>
</tr>
<tr>
<td>Housing Material</td>
<td>SG Iron</td>
</tr>
<tr>
<td>Oil Quantity Litres</td>
<td>0.75</td>
</tr>
<tr>
<td>Weight (kg)</td>
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</tr>
<tr>
<td>2 Way - 2:1 +</td>
<td>23</td>
</tr>
<tr>
<td>3 Way - 2:1 +</td>
<td>23.5</td>
</tr>
</tbody>
</table>

**Notes:**

#1 Nominal torque values at running speeds of 1500 rpm
#2 Maximum running torque value at speed of 10 rpm
Full detailed performance for each unit refer to page 12 & 13

## Accessories & Options

- Special Gear Ratio
- Motor Flange
- Extended Drive Shaft
- Limit Switches
- Drives
- Light Weight Design
- Reinforced Shaft OR High Torque
- Breather
- 90° Breather
- Mounting Feet
- Shaft Cover
- Stainless Steel
- Submersible
- Corrosion Protection
- Nuclear Rated
- Food Grade
- Low Temperature
- High Temperature

## 2 Way Solid Shaft

### 38242M

![Diagram of 2 Way Solid Shaft](image)

**Notes:**

1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

---

www.powerjacks.com
Range-N
Series 38
Ratio 2:1 & above

3 Way Solid Shaft

38342M

4 Way Solid Shaft

38742M

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
Accessories & Options

- Special Gear Ratio
- Extended Drive Shaft
- Drives
- Reinforced Shaft OR High Torque
- 90° Breather
- Shaft Cover
- Submersible
- Nuclear Rated
- Low Temperature
- Motor Flange
- Limit Switches
- Light Weight Design
- Breather
- Mounting Feet
- Stainless Steel
- Corrosion Protection
- Food Grade
- High Temperature

Performance

<table>
<thead>
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<th>Torque (Nm)</th>
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<td>Max Start-Up</td>
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<tr>
<td>Input Speed Max (rpm)</td>
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<td>Thermal Limit Power (kW)</td>
<td>20.5</td>
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<tr>
<td>Backlash arcmin</td>
<td>9 to 16</td>
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<tr>
<td>Efficiency (%)</td>
<td>95% - 98%</td>
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<tr>
<td>Service Life (hours)</td>
<td>&gt;10000</td>
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<tr>
<td>Housing Material</td>
<td>SG Iron</td>
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<td>Oil Quantity Litres</td>
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<td>Pints</td>
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<td>2 Way - 2:1 +</td>
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<tr>
<td></td>
<td>3 Way - 1:1 &amp; 1.5:1</td>
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<tr>
<td></td>
<td>3 Way - 2:1 +</td>
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</table>

Notes:
#1 Nominal torque values at running speeds of 1500 rpm
#2 Maximum running torque value at speed of 10 rpm
Full detailed performance for each unit refer to page 12 & 13

2 Way Hollow Shaft

38K41M

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
3 Way Hollow Shaft

38041M

4 Way Hollow Shaft

38J41M

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
Range-N
Series 39
Ratio 1:1 & 1.5:1

Performance

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<th>Accessory/Option</th>
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<td>Drives</td>
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<td>Light Weight Design</td>
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<td>Reinforced Shaft OR High Torque</td>
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<td>Breather</td>
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<tr>
<td>90° Breather</td>
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<td>Stainless Steel</td>
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<td>Low Temperature</td>
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<tr>
<td>High Temperature</td>
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</tbody>
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Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

2 Way Solid Shaft

39241M

Tapped hole in end of each solid drive shaft - M12 x 30mm Deep

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
3 Way Solid Shaft

39341M

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

4 Way Solid Shaft

39741M

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

Tapped hole in end of each solid drive shaft - M12 x 30mm Deep

Oil Plug

14 x 9 x 70 (keyway) 2.5

Oil Plug

4 Mounting Holes on Sides 5 and 6, M12 x 25 Deep

4 Mounting Holes on Sides 5 and 6, M12 x 25 Deep
Accessories & Options

Special Gear Ratio
Extended Drive Shaft
Drives
Reinforced Shaft OR High Torque
90° Breather
Shaft Cover
Submersible
Nuclear Rated
Low Temperature
Motor Flange
Limit Switches
Light Weight Design
Breather
Mounting Feet
Stainless Steel
Corrosion Protection
Food Grade
High Temperature

Performance

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<td></td>
<td>Max Start-Up</td>
<td>1403</td>
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<tr>
<td>Input Speed</td>
<td>Max (rpm)</td>
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<tr>
<td>Thermal Limit</td>
<td>Power (kW)</td>
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<tr>
<td>Backlash</td>
<td>arcmin</td>
<td>7 to 10</td>
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<td>Efficiency</td>
<td>(%)</td>
<td>95% - 98%</td>
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<tr>
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<td>(hours)</td>
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<td>Weight (kg)</td>
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<td>3 Way - 2:1</td>
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</table>

Notes:
1. Nominal torque values at running speeds of 1500 rpm
2. Maximum running torque value at speed of 10 rpm
Full detailed performance for each unit refer to page 12 & 13

2 Way Solid Shaft

39242M

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
3 Way Solid Shaft

39342M

4 Way Solid Shaft

39742M

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
### Accessories & Options

- Special Gear Ratio
- Motor Flange
- Extended Drive Shaft
- Limit Switches
- Drives
- Light Weight Design
- Reinforced Shaft OR High Torque
- Breather
- 90° Breather
- Mounting Feet
- Shaft Cover
- Stainless Steel
- Submersible
- Corrosion Protection
- Nuclear Rated
- Food Grade
- Low Temperature
- High Temperature

### Performance

<table>
<thead>
<tr>
<th>Series 39</th>
<th>Torque (Nm)</th>
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<th>481</th>
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<tbody>
<tr>
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<tr>
<td></td>
<td>Max Start-Up</td>
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<tr>
<td>Input Speed</td>
<td>Max (rpm)</td>
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<tr>
<td>Thermal Limit</td>
<td>Power (kW)</td>
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<tr>
<td>Backlash</td>
<td>arcmin</td>
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<tr>
<td>Efficiency</td>
<td>(%)</td>
<td>95% - 98%</td>
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</tr>
<tr>
<td>Service Life</td>
<td>(hours)</td>
<td>&gt;10000</td>
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<tr>
<td>Housing Material</td>
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<td>Litres</td>
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<td>Pints</td>
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<tr>
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<td>3 Way - 2:1</td>
<td>53</td>
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</tbody>
</table>

Notes:
- #1 Nominal torque values at running speeds of 1500 rpm
- #2 Maximum running torque value at speed of 10 rpm
- Full detailed performance for each unit refer to page 12 & 13

### 2 Way Hollow Shaft

39K41M

- 4 Mounting Holes on Sides 5 and 6, M12 x 25 Deep
- Tapped hole in end of each solid drive shaft - M12 x 30mm Deep

Notes:
- 1. All dimensions in mm unless otherwise stated
- 2. Dimensions subject to change without notice
Range-N
Series 39
Ratio All

3 Way Hollow Shaft

39041M

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

Tapped hole in end of each solid drive shaft - M12 x 30mm Deep

4 Mounting Holes on Sides 5 and 6, M12 x 25 Deep

14 x 9 x 274 (keyway)

14 x 9 x 70 (keyway) 2.5

4 Mounting Holes on Sides 5 and 6, M12 x 25 Deep

14 x 9 x 274 (keyway)

14 x 9 x 70 (keyway) 2.5

Oil Plug

Oil Plug

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

4 Way Hollow Shaft

39J41M

Tapped hole in end of each solid drive shaft - M12 x 30mm Deep

Tapped hole in end of each solid drive shaft - M12 x 30mm Deep

www.powerjacks.com
Range-N
Series 40
Ratio 1:1 & 1.5:1

Performance

<table>
<thead>
<tr>
<th>Series 40</th>
<th></th>
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<tbody>
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<tr>
<td></td>
<td>Max Start-Up</td>
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<td>Input Speed</td>
<td>Max (rpm)</td>
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<td>Thermal Limit</td>
<td>Power (kW)</td>
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<td>arcmin</td>
<td>7 to 10</td>
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<td>Efficiency</td>
<td>(%)</td>
<td>95% - 98%</td>
</tr>
<tr>
<td>Service Life</td>
<td>(hours)</td>
<td>&gt;10000</td>
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<tr>
<td>Housing Material</td>
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<td>SG Iron</td>
</tr>
<tr>
<td>Oil Quantity</td>
<td>Litres</td>
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<td></td>
<td>Pints</td>
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<td>Weight (kg)</td>
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<td>3 Way - 1:1 &amp; 1.5:1</td>
<td>116</td>
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</tbody>
</table>

Notes:
#1 Nominal torque values at running speeds of 1500 rpm
#2 Maximum running torque value at speed of 10 rpm
Full detailed performance for each unit refer to page 12 & 13

2 Way Solid Shaft

40241M

Tapped hole in end of each solid drive shaft - M16 x 38mm Deep

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

Accessories & Options

- Special Gear Ratio
- Motor Flange
- Extended Drive Shaft
- Limit Switches
- Drives
- Light Weight Design
- Reinforced Shaft OR High Torque
- Breather
- 90° Breather
- Mounting Feet
- Shaft Cover
- Stainless Steel
- Submersible
- Corrosion Protection
- Nuclear Rated
- Food Grade
- Low Temperature
- High Temperature
3 Way Solid Shaft

4 Way Solid Shaft

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
Range-N
Series 40
Ratio 2 & above

Performance

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<thead>
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<tr>
<td>Input Speed Max (rpm) 3000</td>
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<tr>
<td>Thermal Limit Power (kW) 90</td>
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<td>Backlash arcmin 7 to 10</td>
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<tr>
<td>Service Life (hours) &gt;10000</td>
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<tr>
<td>Housing Material SG Iron</td>
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<td>Oil Quantity Litres 3.27</td>
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<td>Pints 5.75</td>
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<tr>
<td>Weight (kg) 2 Way - 2:1 + 126.5</td>
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<td>3 Way - 2:1 + 131</td>
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Notes:
#1 Nominal torque values at running speeds of 1500 rpm
#2 Maximum running torque value at speed of 10 rpm
Full detailed performance for each unit refer to page 12 & 13

Accessories & Options

- Special Gear Ratio
- Motor Flange
- Extended Drive Shaft
- Limit Switches
- Drives
- Light Weight Design
- Reinforced Shaft OR High Torque
- Breather
- 90° Breather
- Mounting Feet
- Shaft Cover
- Stainless Steel
- Submersible
- Corrosion Protection
- Nuclear Rated
- Food Grade
- Low Temperature
- High Temperature

2 Way Solid Shaft

40242M

Tapped hole in end of each solid drive shaft - M16 x 38mm Deep

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
3 Way Solid Shaft

40342M

4 Mounting Holes on Sides 5 and 6, M16 x 30 Deep

Tapped hole in end of each solid drive shaft - M16 x 38mm Deep

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

Oil Plug
18 x 11 x 90 (keyway) 5

4 Way Solid Shaft

40742M

4 Mounting Holes on Sides 5 and 6, M16 x 30 Deep

Tapped hole in end of each solid drive shaft - M16 x 38mm Deep

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

Oil Plug
18 x 11 x 90 (keyway) 5

www.powerjacks.com
Performance

<table>
<thead>
<tr>
<th>Accessories &amp; Options</th>
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<td>Breather</td>
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<td>Mounting Feet</td>
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Notes:
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2. Dimensions subject to change without notice

Series 40

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<td>Backlash arcmin</td>
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<td>Service Life (hours)</td>
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<td>Housing Material</td>
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<td>2 Way - 2:1 +</td>
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<td>3 Way - 1:1 &amp; 1:5:1</td>
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<tr>
<td>3 Way - 2:1 +</td>
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Notes:
#1 Nominal torque values at running speeds of 1500 rpm
#2 Maximum running torque value at speed of 10 rpm
Full detailed performance for each unit refer to page 12 & 13

www.powerjacks.com
3 Way Hollow Shaft

40041M

4 Mounting Holes on Sides 5 and 6, M16 x 30 Deep

Tapped hole in end of each solid drive shaft - M16 x 38mm Deep

18 x 11 x 336 (keyway)

Oil Plug

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

4 Way Hollow Shaft

40J41M

4 Mounting Holes on Sides 5 and 6, M16 x 30 Deep

Tapped hole in end of each solid drive shaft - M16 x 38mm Deep

18 x 11 x 336 (keyway)

Oil Plug

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
Performance

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<tr>
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<tr>
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Notes:
#1 Nominal torque values at running speeds of 1500 rpm
#2 Maximum running torque value at speed of 10 rpm
Full detailed performance for each unit refer to page 12 & 13

Accessories & Options

- Special Gear Ratio
- Extended Drive Shaft
- Drives
- Reinforced Shaft OR High Torque
- 90° Breather
- Shaft Cover
- Submersible
- Nuclear Rated
- Low Temperature
- Motor Flange
- Limit Switches
- Light Weight Design
- Breather
- Mounting Feet
- Stainless Steel
- Corrosion Protection
- Food Grade
- High Temperature

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice

3 Way Solid Shaft

4 Way Solid Shaft

Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
**Range-N**
**Series 42**
**Ratio 2 & above**

**Performance**

<table>
<thead>
<tr>
<th>Series 42</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque (Nm)</td>
<td>Nominal#1 6195</td>
</tr>
<tr>
<td></td>
<td>Max Running#2 7000</td>
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<tr>
<td></td>
<td>Max Start-Up 10500</td>
</tr>
<tr>
<td>Input Speed</td>
<td>Max (rpm) 3000</td>
</tr>
<tr>
<td>Thermal Limit</td>
<td>Power (kW) 190</td>
</tr>
<tr>
<td>Backlash</td>
<td>arcmin 7 to 10</td>
</tr>
<tr>
<td>Efficiency</td>
<td>(%) 95% - 98%</td>
</tr>
<tr>
<td>Service Life</td>
<td>(hours) &gt;10000</td>
</tr>
<tr>
<td>Housing Material</td>
<td>5G Iron</td>
</tr>
<tr>
<td>Oil Quantity</td>
<td>Litres 7</td>
</tr>
<tr>
<td></td>
<td>Pints 12.3</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>2 Way - 2:1 + 215</td>
</tr>
<tr>
<td></td>
<td>3 Way - 2:1 + 223</td>
</tr>
</tbody>
</table>

Notes:
#1 Nominal torque values at running speeds of 1500 rpm
#2 Maximum running torque value at speed of 10 rpm
Full detailed performance for each unit refer to page 12 & 13

**Accessories & Options**

- Special Gear Ratio
- Motor Flange
- Extended Drive Shaft
- Limit Switches
- Drives
- Light Weight Design
- Reinforced Shaft OR High Torque
- Breather
- 90° Breather
- Mounting Feet
- Shaft Cover
- Stainless Steel
- Submersible
- Corrosion Protection
- Nuclear Rated
- Food Grade
- Low Temperature
- High Temperature

**2 Way Solid Shaft**

42242M

**Notes:**
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2. Dimensions subject to change without notice
Range-N
Series 42
Ratio All

Performance

<table>
<thead>
<tr>
<th>Performance</th>
<th>Series 42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque (Nm)</td>
<td>Nominal#1</td>
</tr>
<tr>
<td></td>
<td>Max Running#2</td>
</tr>
<tr>
<td></td>
<td>Max Start-Up</td>
</tr>
<tr>
<td>Input Speed (Max rpm)</td>
<td>3000</td>
</tr>
<tr>
<td>Thermal Limit (kW)</td>
<td>190</td>
</tr>
<tr>
<td>Backlash (arcmin)</td>
<td>7 to 10</td>
</tr>
<tr>
<td>Efficiency (%)</td>
<td>95% - 98%</td>
</tr>
<tr>
<td>Service Life (hours)</td>
<td>&gt;10000</td>
</tr>
<tr>
<td>Housing Material</td>
<td>SG Iron</td>
</tr>
<tr>
<td>Oil Quantity (Litres)</td>
<td>7</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>190</td>
</tr>
<tr>
<td></td>
<td>2 Way - 1:1 &amp; 1.5:1</td>
</tr>
<tr>
<td></td>
<td>197</td>
</tr>
<tr>
<td></td>
<td>2 Way - 2:1 +</td>
</tr>
<tr>
<td></td>
<td>215</td>
</tr>
<tr>
<td></td>
<td>3 Way - 1:1 &amp; 1.5:1</td>
</tr>
<tr>
<td></td>
<td>223</td>
</tr>
<tr>
<td></td>
<td>3 Way - 2:1 +</td>
</tr>
</tbody>
</table>

Notes:
#1 Nominal torque values at running speeds of 1500 rpm
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Accessories & Options

- Special Gear Ratio
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- High Temperature

Notes:
1. All dimensions in mm unless otherwise stated
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Notes:
1. All dimensions in mm unless otherwise stated
2. Dimensions subject to change without notice
Motor Adapters

<table>
<thead>
<tr>
<th>Motor frame Size B5 Flange</th>
<th>Gear unit Series</th>
<th>Gear Ratio</th>
<th>Dimension 'A'</th>
<th>Gear Unit Prefix for Product Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>71</td>
<td>35</td>
<td>All</td>
<td>115</td>
<td>A</td>
</tr>
<tr>
<td>80</td>
<td>35</td>
<td>All</td>
<td>115</td>
<td>B</td>
</tr>
<tr>
<td>90</td>
<td>37</td>
<td>All</td>
<td>130</td>
<td>C</td>
</tr>
<tr>
<td>100</td>
<td>37</td>
<td>1:1 &amp; 1.5:1</td>
<td>130</td>
<td>D</td>
</tr>
<tr>
<td>100</td>
<td>37</td>
<td>2:1</td>
<td>140</td>
<td>D</td>
</tr>
<tr>
<td>112</td>
<td>37</td>
<td>1:1 &amp; 1.5:1</td>
<td>130</td>
<td>D</td>
</tr>
<tr>
<td>112</td>
<td>37</td>
<td>2:1</td>
<td>140</td>
<td>D</td>
</tr>
<tr>
<td>122</td>
<td>38</td>
<td>All</td>
<td>190</td>
<td>D</td>
</tr>
<tr>
<td>132</td>
<td>38</td>
<td>All</td>
<td>190</td>
<td>E</td>
</tr>
<tr>
<td>132</td>
<td>39</td>
<td>All</td>
<td>220</td>
<td>E</td>
</tr>
<tr>
<td>160</td>
<td>38</td>
<td>1:1, 1.5:1 &amp; 2:1</td>
<td>190</td>
<td>F</td>
</tr>
<tr>
<td>160</td>
<td>38</td>
<td>3:1 &amp; 4:1</td>
<td>210</td>
<td>F</td>
</tr>
<tr>
<td>160</td>
<td>39</td>
<td>1:1, 1.5:1 &amp; 2:1</td>
<td>220</td>
<td>F</td>
</tr>
<tr>
<td>180</td>
<td>39</td>
<td>3:1 &amp; 4:1</td>
<td>240</td>
<td>F</td>
</tr>
<tr>
<td>180</td>
<td>39</td>
<td>1:1, 1.5:1 &amp; 2:1</td>
<td>220</td>
<td>G</td>
</tr>
<tr>
<td>180</td>
<td>39</td>
<td>3:1 &amp; 4:1</td>
<td>240</td>
<td>G</td>
</tr>
<tr>
<td>200</td>
<td>40</td>
<td>All</td>
<td>280</td>
<td>G</td>
</tr>
<tr>
<td>225 : 2 Pole</td>
<td>40</td>
<td>All</td>
<td>280</td>
<td>H</td>
</tr>
<tr>
<td>225 : 4-8 Pole</td>
<td>40</td>
<td>All</td>
<td>310</td>
<td>J</td>
</tr>
<tr>
<td>250 : 2 Pole</td>
<td>40</td>
<td>All</td>
<td>310</td>
<td>K</td>
</tr>
</tbody>
</table>

Notes:
1. All standard motor adapters use a B5 IEC flange.
2. All Flange dimensions conform to standard IEC electric motor details.
3. NEMA flanges available on request.
Stainless Steel Bevel Gearboxes

Stainless steel gearboxes are recommended for use in applications which require one or more of the following properties:

- High corrosion resistance.
- Hygienic for food processing.
- Good chemical resistance.
- Resistance to fire & high temperatures.
- Strength at low temperatures.
- Stainless steel has good recycling options.
- Easy to clean surfaces.
- Non-magnetic options available.

All of which makes stainless steel gearboxes ideally suitable for industries such as marine, paper, chemical, food, beverage, nuclear, oil and gas.

Optional Features

Extended Drive Shafts

For each gearbox size the drive shafts (input or output) can be extended in length for solid shaft or hollow shaft designs.

For an application these designs can:

- Eliminate the need for extra drives shafts.
- Reduce the number of couplings.
- Reduce the overall installation cost.
- Reduce the associated maintenance and spare parts inventory and cost.
- Allow the machine design to be fully optimised.
Submersible Gearboxes

All the Range-N bevel gearboxes are available with submersible designs. Each submersible variant design is tailored exactly to the customer application.

Submersible design options include:
- Fresh water or sea water applications.
- Reinforced sealing.
- Designs for depths up to 3000m. Deeper on request.
- Pressure compensation connections.
- Flooded housing design.
- High and/or low temperature rating.
- ROV (Remote Operated Vehicle) connections.
- Reinforced drive shafts.
- Shock load resistant designs.
- Vibration resistant designs.
- Special paint finish.
- Special material grades.

Design Possibilities / Designed For You

The Range-N bevel gearboxes are provided as a range of standard bevel gearboxes and as a range of engineered gearboxes. Each gearbox design can be altered to suit exact application requirements such as:

- Low weight designs.
- Long or short drive shafts.
- Keyless shafts.
- Shafts with threaded sections.
- Alternative shaft profiles e.g. hexagonal.
- Nuclear rated gearboxes.
- Food & beverage processing grade gearboxes.
- Special shaft sealing.
- Integrated or bolt on base flange.
- Extra mounting holes.
- Motor adapters for servo, hydraulic or air motors.
- Integrated limit switches.
- Protective shaft covers.
- High & low temperature rated designs.
- Alternative housing designs e.g. curved.
- High corrosion & chemical resistant designs.

Use Neeter Drive engineering technology to bring your concept to reality.
Single Face Screw Jacks

- Metric Machine Screw Jacks 10kN to 3500kN
- Metric Ball Screw Jacks 10kN to 500kN
- Metric Stainless Steel Screw Jacks 10kN to 500kN
- Imperial [inch] Machine Screw Jacks 1/4Ton to 250Ton
- Imperial [inch] Ball Screw Jacks 1/2Ton to 50Ton
- Imperial [inch] Stainless Steel Screw Jacks 2Ton to 100Ton
- Special Designs Available

EMA Linear Actuators

- Machine Screw & Ball Screw
- Low load, Medium Duty, High Speed
- Dynamic Load Ratings up to 10kN
- Linear Speeds up to 5500 mm/min
- 3-phase AC, 1-phase AC, and DC types
- Special Designs Available

Rolaram Linear Actuators

- Ball Screw & Roller Screw
- High load, High Duty, High Speed
- Very High Accuracy
- Dynamic Load Ratings up to 400kN
- Linear Speeds up to 7000 mm/min
- 3-phase AC, 1-phase AC, and DC types
- Special Designs Available

Spiracon Roller Screws

- High Dynamic Loads up to 1200kN
- High Efficiency
- High Positional Accuracy
- Long Life
- Low Maintenance
- Low Noise
- Robust Design for Harsh Environments
- Special Designs Available
Lifting & Positioning Solutions

Power Jacks are specialist industrial engineers providing design, manufacturing and services of quality industrial lifting, positioning and load monitoring equipment.

Our products are supplied globally across many sectors including Industrial Automation, Energy, Transport, Defence and Civil.