Series Gearbox for Pinion Stand

NGC
Geared for a Better Future
About NGC

NGC was founded in 1969 and has been publicly listed on the Hong Kong stock exchange since 2007. NGC is focused on gearbox & drive technology solutions for wind energy, rail vehicles, industrial applications, marine equipment, machine tools and LED.

NGC provides products, technologies and services to the global market. During the past ten years, tremendous investment has been made in the fields of clean energy and high efficiency-low consumption applications. With its state-of-the-art technology, reliable quality and excellent service, NGC has become a competitive partner in the global drive technology market.

In the pursuit of excellence in the industrial transmission sector, NGC has taken a leadership role by developing multiple ground breaking products and services.

Over the years, with an improved product portfolio widely applied in cement processing, metallurgical equipment, rubber & plastic machinery, power generation, marine, lifting equipment, paper-making and material handling, NGC has met the demand from customers in almost every industry.

Through close cooperation with domestic and international customers, supported by global R&D centers, NGC has always been able to provide solutions beyond customers’ expectations. With full confidence in heart, NGC is leading the industry for a higher standard.
Introduction

Pinion stand is core drive parts in the field of metallurgy, transfer torque, ensure the synchronous operation of machine, widely used in steel rolling, billet processing, non-ferrous metal rolling, etc. of metallurgical industry, it’s used in bad working conditions. The pinion stand has the characteristics of smaller volume, lighter weight, larger torque, higher reliability, it has a high level of technology in the country and world.

Introduction of basic types

The pinion stand are classified into eight size according to center distance, every size has two types according to different loading. Product marking methods are as follow:

Example 1:
Product with 900 center distance, high loading, Steel feeding direction L mark CLZ900H-L

Example 2:
The specific classification of pinion stand size 900

Pinion

- Material is 18CrNiMo7-6, carburizing and quenching
- Grade of accuracy is above 6 grade
- Gears are made out of high quality alloy steel both sides are ground, gear modification

Attended mode

- Shrink fit on two part
- The safety factor of the transmission torque is high
- Convenient assembly

Gear mesh

- Guaranteed accuracy using eccentric sleeve
- Ensure the pinion gear for moderate

Casing

- Welded box, all welds to have full depth penetration
- It used plate Q235B, bearing box used casting
- FKM combined with our accumulated plentiful experience is used to design Casing

Seal components

- It does not need to be replaced for labyrinth seal
- Low risk of oil spills because it has large space for return oil

Bearing

- Adopt international famous brand bearing, the life-time is designed according to standard ISO281/16281.
Attended mode
1) Input of pinion stand connected with motor (or main reducer) by coupling
2) Output of pinion stand connected with rolling by coupling

Lubricating system
Pinion and bearing are used forced lubrication, customer need buy oil station for normal operation of pinion stand, and circulation, filtration, cooling.

Selection guide

| Selection for pinion stand | 1: Determine the nominal power, speed or nominal torque \( T = \frac{9.55 \times P}{n} \)
|                          | 2: Determine the size of pinion stand
|                          | Confirm the type of pinion stand is given in torque tables (Table 5 and Table 6) depending on \( T \)

Symbol description

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>( K_a )</td>
<td>Coefficient</td>
</tr>
<tr>
<td>( i )</td>
<td>Actual ratio (changeless)</td>
</tr>
<tr>
<td>( n )</td>
<td>Input speed of pinion stand (rpm)</td>
</tr>
<tr>
<td>( P )</td>
<td>Calculated power rating of pinion stand (kW)</td>
</tr>
<tr>
<td>( T )</td>
<td>Calculated torque of pinion stand (kNm)</td>
</tr>
</tbody>
</table>

Factors

Table 1 Factor \( K_a \) for driven machine of metallurgy industry

<table>
<thead>
<tr>
<th>Driven machines</th>
<th>Factor ( K_a ) for driven machine of metallurgy industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolling for plate</td>
<td>1.75</td>
</tr>
<tr>
<td>Billet processing</td>
<td>2.5</td>
</tr>
<tr>
<td>Other</td>
<td>Consult</td>
</tr>
</tbody>
</table>

Calculation Example

Known criteria
Prime mover is motor
Motor power: \( P = 10000 \) kW
Input speed: \( n = 360 \) rpm
Driven machine is rolling, center distance is \( 900 \) mm, Steel feeding direction is left
Duty: 24h/day
Requirements: Calculation of the type, size and Add-on Pieces of pinion stand

1. Calculated size of the pinion stand
   Calculated center distance of pinion stand according to working machine
2. Calculated type of pinion stand
   - Calculation of the Nominal pinion stand Power Rating
   \( P = 10000 \) kW
   - Calculation of the Nominal pinion stand Torque (rating Torque)
   \( T = \frac{9.55 \times 10000}{36} = 2652 \) kNm
   - Determination of Steel feeding direction
   Attached: Discriminated method for Steel feeding direction

Determination of pinion stand Size
Selected from table 1, table 2: type CLZ900H-L
Pinion stand type CLZ900H-L

3. Determination of pinion stand Dimension
   The pinion stand dimension is given in table.

4. Determination of the lubricating system and Add-on Pieces
   The pinion stand adopts forced lubrication, Determination of NGC pinion stand standard layout according to the table given in table
Table 1 Dimensions of pinion stand (high loading)

<table>
<thead>
<tr>
<th>Type</th>
<th>Power</th>
<th>Speed</th>
<th>Rating Torque</th>
<th>Max Torque</th>
<th>A</th>
<th>H0</th>
<th>H1</th>
<th>H2</th>
<th>4-ΦB</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>L X W X H</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLZ650H</td>
<td>10000</td>
<td>139.4</td>
<td>530</td>
<td>685</td>
<td>1199</td>
<td>850</td>
<td>180</td>
<td>250</td>
<td>350</td>
<td>135</td>
<td>720</td>
<td>965</td>
<td>1000</td>
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<tr>
<td>CLZ700H</td>
<td>10000</td>
<td>121.6</td>
<td>500</td>
<td>785</td>
<td>1373</td>
<td>900</td>
<td>180</td>
<td>350</td>
<td>450</td>
<td>135</td>
<td>720</td>
<td>965</td>
<td>1000</td>
</tr>
<tr>
<td>CLZ800H</td>
<td>10000</td>
<td>51.7</td>
<td>400</td>
<td>1846</td>
<td>3230</td>
<td>150</td>
<td>410</td>
<td>600</td>
<td>800</td>
<td>150</td>
<td>930</td>
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<td>1000</td>
</tr>
<tr>
<td>CLZ850H</td>
<td>10000</td>
<td>44.2</td>
<td>340</td>
<td>2157</td>
<td>3775</td>
<td>185</td>
<td>500</td>
<td>800</td>
<td>1000</td>
<td>150</td>
<td>1140</td>
<td>1150</td>
<td>1100</td>
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<tr>
<td>CLZ900H</td>
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<td>36.1</td>
<td>300</td>
<td>2653</td>
<td>4643</td>
<td>165</td>
<td>600</td>
<td>800</td>
<td>1000</td>
<td>150</td>
<td>1140</td>
<td>1150</td>
<td>1100</td>
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<td>CLZ950H</td>
<td>10000</td>
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<td>280</td>
<td>3279</td>
<td>5139</td>
<td>185</td>
<td>700</td>
<td>900</td>
<td>1000</td>
<td>150</td>
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<td>1100</td>
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<td>1000</td>
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<td>1140</td>
<td>1200</td>
<td>1250</td>
</tr>
</tbody>
</table>

Note: (1) The tolerance of H2 is ±0.5 mm.
(2) The flange of pinion stand is JB/ZQ4477-2006,DN150 is used on center distance 650,700,800, other DN200.
Table 2 Dimensions of pinion stand (light loading)

<table>
<thead>
<tr>
<th>Type</th>
<th>Power</th>
<th>Speed</th>
<th>Rating Torque</th>
<th>Max Torque</th>
<th>A</th>
<th>H0</th>
<th>H1</th>
<th>H2</th>
<th>P1X/P2</th>
<th>P3</th>
<th>L X W X H</th>
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<tr>
<td>CLZ650L</td>
<td>1000</td>
<td>204.8-530</td>
<td>466</td>
<td>816</td>
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<td>135</td>
<td>595X985</td>
<td>1000</td>
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<tr>
<td>CLZ700L</td>
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<td>178.8-500</td>
<td>534</td>
<td>934</td>
<td>700</td>
<td>180</td>
<td>150</td>
<td>650</td>
<td>135</td>
<td>595X985</td>
<td>1000</td>
</tr>
<tr>
<td>CLZ800L</td>
<td>1000</td>
<td>74.6-400</td>
<td>1280</td>
<td>2240</td>
<td>800</td>
<td>165</td>
<td>410</td>
<td>800</td>
<td>135</td>
<td>750X1150</td>
<td>1000</td>
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<tr>
<td>CLZ850L</td>
<td>1000</td>
<td>54.55-340</td>
<td>1975</td>
<td>3664</td>
<td>850</td>
<td>185</td>
<td>500</td>
<td>800</td>
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<td>1100</td>
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<tr>
<td>CLZ900L</td>
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<td>47.83-300</td>
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<td>185</td>
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<td>1250</td>
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Table 3 Axial dimensions of pinion stand (high loading) and fit dimensions coupling

<table>
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<tr>
<th>Type</th>
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<th>Speed</th>
<th>Rating Torque</th>
<th>Max Torque</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
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<td>405</td>
<td>410</td>
<td>325</td>
<td>320</td>
<td>215</td>
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<td>170</td>
<td>205</td>
<td>1250</td>
<td>1250</td>
</tr>
<tr>
<td>CLZ700H</td>
<td>1000</td>
<td>121.65-500</td>
<td>785</td>
<td>1373</td>
<td>436.8</td>
<td>438.8</td>
<td>398.7</td>
<td>396.7</td>
<td>275</td>
<td>250</td>
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<td>250</td>
<td>1350</td>
<td>1350</td>
</tr>
<tr>
<td>CLZ800H</td>
<td>1000</td>
<td>51.73-400</td>
<td>1846</td>
<td>3230</td>
<td>526.6</td>
<td>528.6</td>
<td>478.2</td>
<td>476.2</td>
<td>340</td>
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<td>266</td>
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<td>1370</td>
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<tr>
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<td>44.27-340</td>
<td>2157</td>
<td>3775</td>
<td>596.5</td>
<td>598.5</td>
<td>528.3</td>
<td>526.3</td>
<td>385</td>
<td>365</td>
<td>300</td>
<td>320</td>
<td>1550</td>
<td>1550</td>
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<td>1000</td>
<td>36-340</td>
<td>2653</td>
<td>4643</td>
<td>596.5</td>
<td>598.5</td>
<td>528.3</td>
<td>526.3</td>
<td>385</td>
<td>365</td>
<td>300</td>
<td>320</td>
<td>1550</td>
<td>1550</td>
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<tr>
<td>CLZ950H</td>
<td>1000</td>
<td>29.12-280</td>
<td>3279</td>
<td>5739</td>
<td>696.7</td>
<td>698.7</td>
<td>628.5</td>
<td>626.5</td>
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<td>390</td>
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<td>370</td>
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<td>1640</td>
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<td>CLZ1000H</td>
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<td>666.5</td>
<td>410</td>
<td>390</td>
<td>350</td>
<td>370</td>
<td>1640</td>
<td>1640</td>
</tr>
</tbody>
</table>

Note: ① The tolerance of H2 is -0.5~0
② The flange of pinion stand is JB/ZQ4477-2006,DN150 is used on center distance 650,700,800, other DN200.
Table 4 Axial dimensions of pinion stand (light loading) and fit dimensions coupling

<table>
<thead>
<tr>
<th>Type</th>
<th>Power</th>
<th>Speed</th>
<th>Torque</th>
<th>Flange size</th>
<th>Valve size</th>
<th>Pressure Gage</th>
<th>Flowmeter</th>
<th>Pressure switch</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>kW</td>
<td>rpm</td>
<td>[kNm]</td>
<td>[mm]</td>
<td>[mm]</td>
<td>[mm]</td>
<td>[mm]</td>
<td>[mm]</td>
<td></td>
</tr>
<tr>
<td>CLZ650L</td>
<td>1000</td>
<td>178.5</td>
<td>178.8</td>
<td>74.6</td>
<td>53.4</td>
<td>436.8</td>
<td>1200</td>
<td>200</td>
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</tr>
<tr>
<td>CLZ700L</td>
<td>1000</td>
<td>178.5</td>
<td>178.8</td>
<td>74.6</td>
<td>53.4</td>
<td>436.8</td>
<td>1200</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>CLZ800L</td>
<td>1000</td>
<td>178</td>
<td>178.8</td>
<td>74.6</td>
<td>53.4</td>
<td>436.8</td>
<td>1200</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>CLZ900L</td>
<td>1000</td>
<td>178.5</td>
<td>178.8</td>
<td>74.6</td>
<td>53.4</td>
<td>436.8</td>
<td>1200</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>CLZ1000L</td>
<td>1000</td>
<td>178.5</td>
<td>178.8</td>
<td>74.6</td>
<td>53.4</td>
<td>436.8</td>
<td>1200</td>
<td>200</td>
<td></td>
</tr>
</tbody>
</table>

Note: The tolerance of D1, D2, D3, D4 is h6 in table 4.
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Note: The model numbers and parameters will be updated occasionally without notice, please refer to the latest NGC brochures.