Cyclo® HBB HELICAL BUDDYBOX

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Steel hypoid gear technology, maintenance-free grease lubrication and a compact modular housing makes the Hyponic® an efficient performer in the food industry.

A 15-hp Beier mechanical variable speed drive with electric remote control provides an adjustable, steady speed range for the 310-ft. oven-belt conveyor.

Bottling/Baking

Material Handling

Sumitomo Paramax® reducers provide basic, whole-gear wheels for both the hoist and trolley drive systems in the 12,000-ton capacity DC Trolley Hoist used for heavy-duty coil-handling service.

In less than 20 minutes, 96 Sumitomo Cyclo® Bevel Buddybox gearmotors help retract the 13,000-ton roof on Seattle’s Safeco Field. The Sumitomo gearmotors, on eight travel truck assemblies, turn 128 36” wheels.

Once flooring is side-matched, it is inspected for defects. This conveyor, driven by Sumitomo Cyclo® drives, carries defective material to the hammer mill.

Wood Products

Stainless steel is formed on the five-stand continuous caster at this steel mill, it is conveyed by Sumitomo Cyclo® drives on the auto-tech conveyors where the steel is cut into billets.

Steel

Wood Products

Rugged Helical Output, Modular Cyclo® Input, Compact Size

The Cyclo® HBB is also available as a Speed Reducer

To request a catalog, or for more information on any of our high quality products, please visit our Website:

www.smcycolo.com
Steel hypoid gear technology, maintenance-free grease lubrication and a compact modular housing makes the Hyponic® an efficient performer in the food industry.

A 15-hp Beier mechanical variable speed drive with electric remote control provides an adjustable, steady speed range for this 350-ft. open-belt conveyor.

Bottling/Baking

Steel Cyclo® mixer drives are a key component of this award-winning water treatment facility in Hillsborough County, Florida.

Material Handling

Each of these Sumitomo Paramax® speed reducers helps pump up to 13 million gallons a day at this state-of-the-art wastewater treatment facility in the City of Clearwater, Florida.

Wood Products

Sumitomo Cyclo® drives are an integral part of this manufacturing plant which produces 150,000 board feet of sanded strip and planed hardwood flooring each week.

Water Treatment

In less than 20 minutes, 96 Sumitomo Cyclo® Bevel Buddybox gearmotors help retract the 13,000-ton roof on Seattle's Safeco Field.

Custom Designs

The Sumitomo gearmotors, on eight travel truck assemblies, turn 128 36" wheels.

Steel

After molten steel is formed in the five-strand continuous caster at this steel mill, it is conveyed by Sumitomo Cyclo® drives on the auto-torch conveyors where the steel is cut into billets.

To request a catalog, or for more information on any of our high quality products, please visit our Website:

www.smcyclo.com
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Double output seals prevent lubricant leaks and protect from contamination.

Patented keyless, steel Taper-Grip® bushing allows for quick and easy mounting and removal. Installs from either side.

Patented universal housing design.

Utilizes all Cyclo® input modifications: C-Face input, integral gearmotor, brakemotor or servomotor.

Cyclo® input provides high overload capacity, exceptional reliability and long service life.

Flexible configurations

- Shaft Options: hollow
- Mounting Options: flange face

Cyclo® Quality and Reliability, Shaft Mount Design

High performance steel gearing components deliver 85-90% efficiency.
Product Description
Sumitomo’s Cyclo® Helical Buddybox (Cyclo® HBB) speed reducers and gearmotors provide innovative shaft mounted drive solutions for demanding services. The Cyclo® HBB combines the quiet, efficient and reliable performance of the Cyclo® technology input with the rugged helical gear output. The modular design provides a compact, efficient product and the most flexible range of output speed and torque combinations available. Sumitomo’s patented Taper Grip® bushing system enhances the Cyclo® HBB value by offering a simple shaft-mounting device that provides self-aligning, backlash-free torque transmission to the driven shaft. The Cyclo® HBB design is flexible and easily adapts to CEMA Screw Conveyor Drive applications with a modular conversion kit.

Features & Benefits
- Cycloidal speed reduction technology
  ~ Quiet, efficient and reliable operation with high torque density and compact size
- Modular design
  ~ Interchangeable cast iron housings in foot, flanged or face mount configurations
- Double output seals
  ~ Virtually leak-free operation and optimal protection from lubrication contamination
- Taper Grip® Bushing
  ~ Simple, steel, keyless shaft mounting system resists fretting and eases unit installation and removal from driven shaft
- CEMA Screw Conveyor Drive option
  ~ Quick and simple conversion for Cyclo® HBB units to fit CEMA standard dimensions

Specifications
- Ratios: 11:1 up to 26,000:1 and greater
- Torque Capacity: Up to 75,800 in. lbs.
- HP: 1/8 to 40
- Mounting: Hollow Shaft, Flange, Face
- Options: Integral Motor, C-Face
- Motor Standards: NEMA, IEC, JIS, UL, CSA, CE

Applications
- Material Handling
- Conveyors
- Baggage Handling
- Shredders
- Belt Filter Press
- Mixer/Blender
- Rolling Mill Table
- Screw Conveyors
- Elevators
- Hoist Drives
- Climber Screens
- Food Processing
### Product Range (Standard Motor and Reducer Combinations)

#### Single Reduction Ratios 11 — 417
Combinations with 1750 RPM motor

<table>
<thead>
<tr>
<th>Ratio</th>
<th>11</th>
<th>18</th>
<th>21</th>
<th>28</th>
<th>39</th>
<th>46</th>
<th>53</th>
<th>60</th>
<th>74</th>
<th>88</th>
<th>102</th>
<th>123</th>
<th>151</th>
<th>179</th>
<th>207</th>
<th>249</th>
<th>305</th>
<th>417</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>159</td>
<td>97.2</td>
<td>83.3</td>
<td>62.5</td>
<td>44.9</td>
<td>33.3</td>
<td>29.2</td>
<td>23.6</td>
<td>19.9</td>
<td>17.2</td>
<td>14.2</td>
<td>11.6</td>
<td>9.8</td>
<td>8.45</td>
<td>7.03</td>
<td>5.74</td>
<td>4.20</td>
<td></td>
</tr>
<tr>
<td>Motor HP</td>
<td>1/8</td>
<td>1/4</td>
<td>1/3</td>
<td>1/2</td>
<td>3/4</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>7.5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

#### Double Reduction Ratios 364 — 4365
Combinations with 1750 RPM motor

Ratios available up to 26,492:1

| Ratio | 364 | 424 | 501 | 578 | 683 | 809 | 956 | 1117 | 1320 | 1656 | 1957 | 2272 | 2559 | 2944 | 3511 | 4365 |
|-------|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Speed RPM (60 Hz) | 4.81 | 4.13 | 3.5 | 3.03 | 2.56 | 2.16 | 1.83 | 1.57 | 1.33 | 1.06 | 0.894 | 0.77 | 0.684 | 0.595 | 0.499 | 0.401 |
| Motor HP | 1/8 | 1/4 | 1/3 | 1/2 | 3/4 | 1 | 1.5 | 2 | 3 | 5 | 7.5 |

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1.4 General Information
How do I select a Cyclo® HBB reducer or gearmotor?
Selection is based on the actual horsepower and/or torque requirements at the output shaft. The Cyclo® HBB speed reducer has particularly high efficiencies over a wide range of reduction ratios, which frequently permits the use of reduced input power requirements (smaller HP motor) without sacrificing output shaft torque. The selection procedures in this catalog, Speed Reducers pages 2.2 - 2.3 and Gearmotors pages 3.2 - 3.3, will guide you in choosing the most efficient reducer for your application.

What information do I need to get started in the selection process?
To select the proper reducer for your application, you will need to know:
- Application: type of driven machine
- Hours of operation per day
- Motor horsepower (HP) and speed (RPM)
- Loading Conditions
- Mounting Position

If there are any special environmental factors or operation requirements, they must also be noted. This information will be important in determining the Service Factor of your application.

What are service factors and how are they used?
In general, reducers and gearmotors are rated for specific conditions and operating requirements of the application by the use of AGMA-defined Service Factors. There are three AGMA load classifications for reducers: uniform (U), moderate shock (M), and heavy shock (H) (page 2.6) and three AGMA load classifications for gearmotors: I, II, and III (pages 3.6 - 3.7). The Service Factors are used in the product selection process to adjust for the specific conditions and operating requirements of your application.

What do I do if my application has particularly severe operating conditions?
The standard ratings for Cyclo® HBB are based on 10-hour daily service under conditions of uniform loads (equivalent to AGMA service factor 1.0). By following the product selection process, you will determine and apply the Service Factors to compensate for severe operating conditions.

How can I be sure that the reducer can withstand periodic excessive overloads?
Cyclo® HBB speed reducers provide 300% momentary intermittent shock loads capacity. For applications with shock loads greater than 300%, consult an SMA Application Engineer.

What are the standard input speeds?
In general terms, the speeds are 1750 and 1165 RPM. The selection tables in this catalog are based on 1750 RPM. When other input speeds are used, the horsepower and torque ratings will vary.

What are the thermal limitations of the Cyclo® HBB?
The Cyclo® speed reducer, by virtue of its smooth, almost frictionless operation (unlike traditional helical gears), has a thermal rating that far exceeds its mechanical capacity and all but eliminates the conventional limitations due to heat.

Why is a Taper-Grip® bushing used? What is its material?
The Taper-Grip® bushing is integral to the Cyclo® HBB and provides for easy mounting and removal to and from the shaft of the driven machine. Because it requires no keyway, the shaft isn’t weakened and maximum torque is transmitted. With the added strength of steel, the Taper-Grip® bushing can be used in reversing and/or high start-up applications. The steel Taper-Grip® bushing can be used on all Taper-Grip® products.

What kind of torque arm do you supply? At what position should it be mounted?
The standard torque arm assembly is shown in the reducer dimensions, pages 2.14 - 2.21 and the gearmotor dimensions, pages 3.52 - 3.63. The torque arm should be mounted at 90 degrees to a line from the point of attachment to the reducer and the center of the output bore with plus or minus 15 degrees variance. It should always be mounted in tension, not compression. T-type and flange-mount (banjo) torque arms are also offered as options.
### Standard Specifications

#### 3-Phase Integral Motor

<table>
<thead>
<tr>
<th>Standard Specifications</th>
<th>Standard Specifications with Built-In Brake</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity Range:</strong></td>
<td>1/8 HP ~ 40 HP, 4P</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Enclosure:</strong></td>
<td>Totally enclosed fan cooled type</td>
</tr>
<tr>
<td></td>
<td>(1/8 HP, 4P Totally enclosed non ventilated)</td>
</tr>
<tr>
<td><strong>Power Supply:</strong></td>
<td>230/460 Volts, 60 Hz</td>
</tr>
<tr>
<td></td>
<td>575 Volts, 60 Hz</td>
</tr>
<tr>
<td><strong>Insulation:</strong></td>
<td>1/8 ~ 30 HP: Class B</td>
</tr>
<tr>
<td></td>
<td>40 HP: Class F</td>
</tr>
<tr>
<td><strong>Time Rating</strong></td>
<td>Continuous</td>
</tr>
</tbody>
</table>

#### Reducer

- **Reduction:** Combination of Cyclo input and helical gear output.
- **Lubrication:** Cyclo portion is grease or oil lubricated; helical portion is oil lubricated.
- **Seals:** Nitrile material, dual lipped, double output seals.
- **Material:** Rugged cast iron housings
- **Paint Color:** Blue, Munsell color number 6.5PB 3.6/8.2
- **Bearings:** Ball bearings on geared output; ball bearings on Cyclo input. Tapered roller bearings optional.

#### Ambient Conditions

- **Installation Location:** Indoors (Minimal dust and humidity)
- **Ambient Temperature:** 14°~104° F (-10º ~ 40º C)
- **Ambient Humidity:** Under 85%
- **Elevation:** Under 3,281 ft. (1000 meters)
- **Atmosphere:** Well ventilated location, free of corrosive gases, explosive gases, vapors and dust.

#### Shaft Rotation

On single reduction Cyclo HBB speed reducers, ratios 11 and 18, the slow speed shaft rotates in a reverse direction to that of the high speed shaft.

On single reduction Cyclo HBB speed reducers, ratios 21 through 417, the slow speed shaft rotates in the same direction as the high speed shaft.

On double reduction units, ratios 364 through 26,492, the slow speed shaft rotates in a reverse direction to that of the high speed shaft.

#### Input Speeds

The standard input speeds of single reduction units are 1750 and 1165 RPM. When non-standard input speeds are used, the horsepower and torque ratings will also vary.

#### Thermal Capacity

The Cyclo HBB speed reducer’s smooth, almost frictionless operation all but eliminates the conventional limitations due to heat. In all sizes, Helical Buddybox speed reducers have thermal ratings that exceed their mechanical capacity.
Mounting Positions

Please see the Appendix (Section 5) for additional mounting configurations.
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