

CYKODRIVE Cycloidal Reducers



- CYKODRIVE 系列減速機是在擺線針輪傳動基礎上發展起來的一種傳動。
The CYKODRIVE series reducer is a type of transmission developed on the basis of cycloidal pinwheel transmission.
- 由漸開線圓柱齒輪行星減速機構和擺線針輪行星減速機構二部份構成。
It consists of two parts: the involute cylindrical gear planetary reduction mechanism and the cycloidal pinion planetary reduction mechanism.
- 漸開線行星齒輪與凸輪軸連成一體，作為擺線針輪傳動部分的輸入。
The involute planetary gear is integrated with the camshaft as an input to the cycloidal pinion drive section.
- 凸輪軸帶動擺線齒輪做偏心運動。凸輪軸向順時針方向旋轉 1 週，擺線齒輪將沿逆時針方向移動 1 個齒。
The camshaft drives the cycloidal gear to perform eccentric motion. The cam shaft rotates clockwise for 1 turn, and the cycloidal gear moves 1 tooth in the counterclockwise direction.

機種型號表示 Indication of Model Numbers

| RS | N | 20 | — | 41 | — | P0 | — | MOTOR |
|----------------|---|---|---|------------------------------|---|---|---|--------------------|
| 減速機機型 Type | 入力表示 Input | 型號 Model | | 速比 Ratio | | 背隙等級 Backlash Class | | 馬達型號 Motor Type |
| RS RD RC | E: 組件式 Component Type N: 入力法蘭 Motor Flange Type S: 入力軸式 Input Shaft Type L: 入力直交 Right Angle | 6 20 40 80 110 160 320 450 | | 41 ~ 171 Note 1 | | Ps ≤ 1 arcmin P0 ≤ 3 arcmin P1 ≤ 5 arcmin | | |

[Note 1] 有關各個機型型號的速比，請參見尺寸頁面。
See the dimension page for gear ratio details.

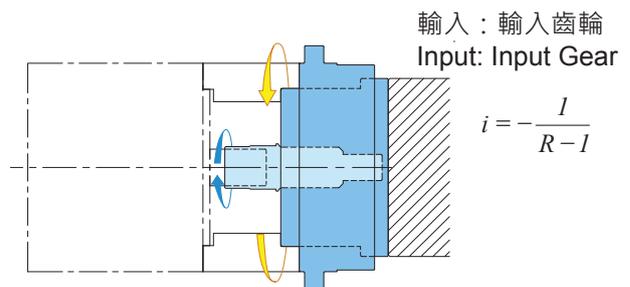
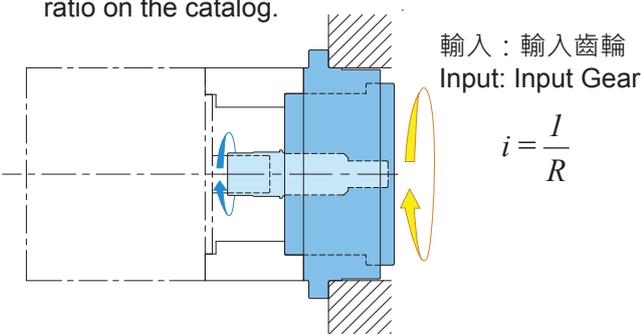


旋轉方向與速比如下圖所示，請選擇最佳使用方法：

The housing is fixed, and the output shaft drive:

- ① 減速機箱體外殼固定，由出力軸輸出的情況：出力軸的旋轉方向與輸入軸的旋轉方向相同。減速比等於型錄上的公稱減速比。
The gearbox casing is fixed, with output from the output shaft:
The rotation direction of the output shaft is the same as the input shaft.
The reduction ratio is equal to the reduction ratio on the catalog.

- ② 出力軸固定，減速機箱體外殼輸出的情況：減速機箱體外殼的旋轉方向與輸入軸的旋轉方向相反。減速比等於型錄上的減速比減 1。
The output shaft is fixed, and the housing drive:
The rotation direction of the housing is the opposite to the input shaft.
The reduction ratio is calculated the reduction ratio on the catalog minus 1.



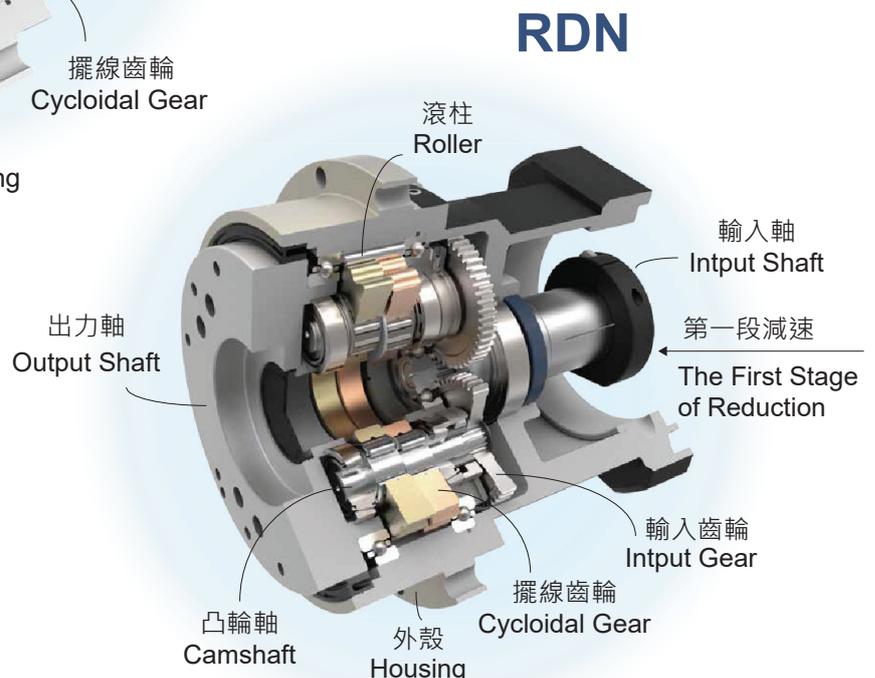
產品樣式選擇 Selection of Type

| | | 入力形式 Input Type | | | |
|---------------------|------------------------------------|-------------------------|-----------------------------|----------------------------|-----------------------|
| | | E 組件式 Component Type | N 入力法蘭 Motor Flange Type | S 入力軸式 Input Shaft Type | L 入力直交 Right Angle |
| 出力形式 Output Type | RS | | | | |
| | RD | | | | |
| | RC 出力中空軸 Hollow Output Shaft | | | | |

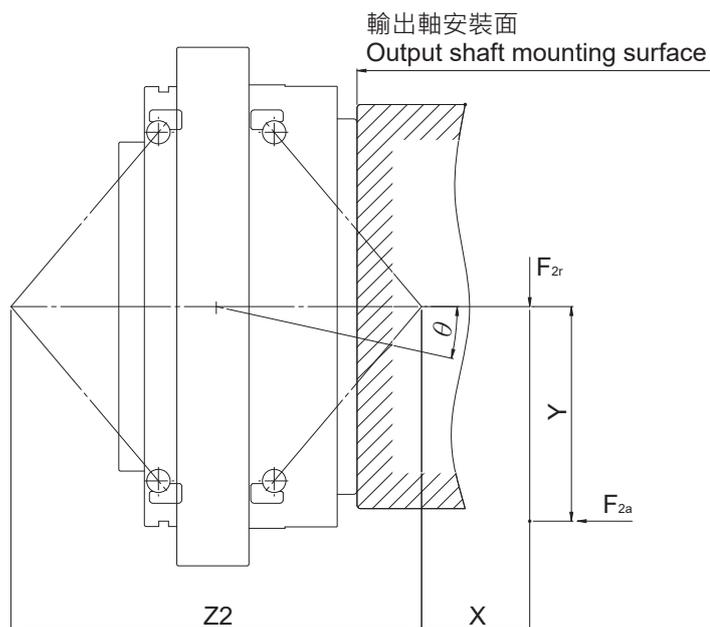
產品特性 Characteristic

- 高可靠性、高剛度、高精度、大扭矩
 1. 最佳化的擺線齒型設計，扭曲剛度非常大。
 2. 兩個擺線輪設計，多齒嚙合增加強度。
 3. 採用雙支撐的斜角滾珠軸承並加大軸承跨距，增加出力端剛性。
 4. 即使施加高達額定轉矩 5 倍的轉矩時，產品也不會損壞。
 5. 高精密的加工技術，使得產品齒隙小 (<1 arcmin)，運轉效率高。
- 追求簡單使用
 1. 已封入潤滑脂，防護等級 IP65，免更換及保護。
 2. 採用筒夾式的鎖緊機構和及這適用於各廠牌的馬達法蘭，使馬達的安裝非常簡單。

- High reliability, high rigidity, high precision, high torque
 1. The optimized cycloidal tooth design makes it very high twisting stiffness.
 2. Dual cycloidal wheels, multi-toothed meshing for increased strength.
 3. Double-supported angular contact ball bearings are used to increase the bearing span and increase the rigidity of the output end.
 4. Even the torque up to 5 times rated torque, the product will not be damaged.
 5. High-precision machining technology makes the product have small backlash (<1 arcmin) and high operating efficiency.
- Easy installation and maintenance
 1. Grease is sealed, protection class IP65. No need to replace the grease.
 2. The motor flange is ready for each brand and a collet-type locking mechanism makes the installation of motor very easy.



主軸承的能力 Capacity of Main Bearing



彎矩剛性 Moment Rigidity

$$\theta = \frac{F_{2a} \cdot Y + F_{2r} \cdot \left(X + \frac{Z2}{2}\right)}{Mt \cdot 1000}$$

| 型號 Model | 彎矩剛性 Moment Rigidity | 尺寸 Dimension |
|-------------|----------------------|--------------|
| | Mt Nm/arcmin | Z2 mm |
| 6 | 108 | 92 |
| 20 | 335 | 114 |
| 40 | 843 | 145 |
| 80 | 1,091 | 162 |
| 110 | 1,356 | 172 |
| 160 | 2,780 | 206 |
| 320 | 4,500 | 248 |
| 450 | 7,000 | 286 |

- θ : 輸出軸的傾斜角度 Deflected Angle of Output Shaft [arcmin]
 Mt : 彎矩剛性 Moment Rigidity [Nm/arcmin]
 F_{2r} 、 F_{2a} : 負荷 Weight [N]
 X 、 Y : 到負荷作用點的距離 Distance to Load Point [mm]

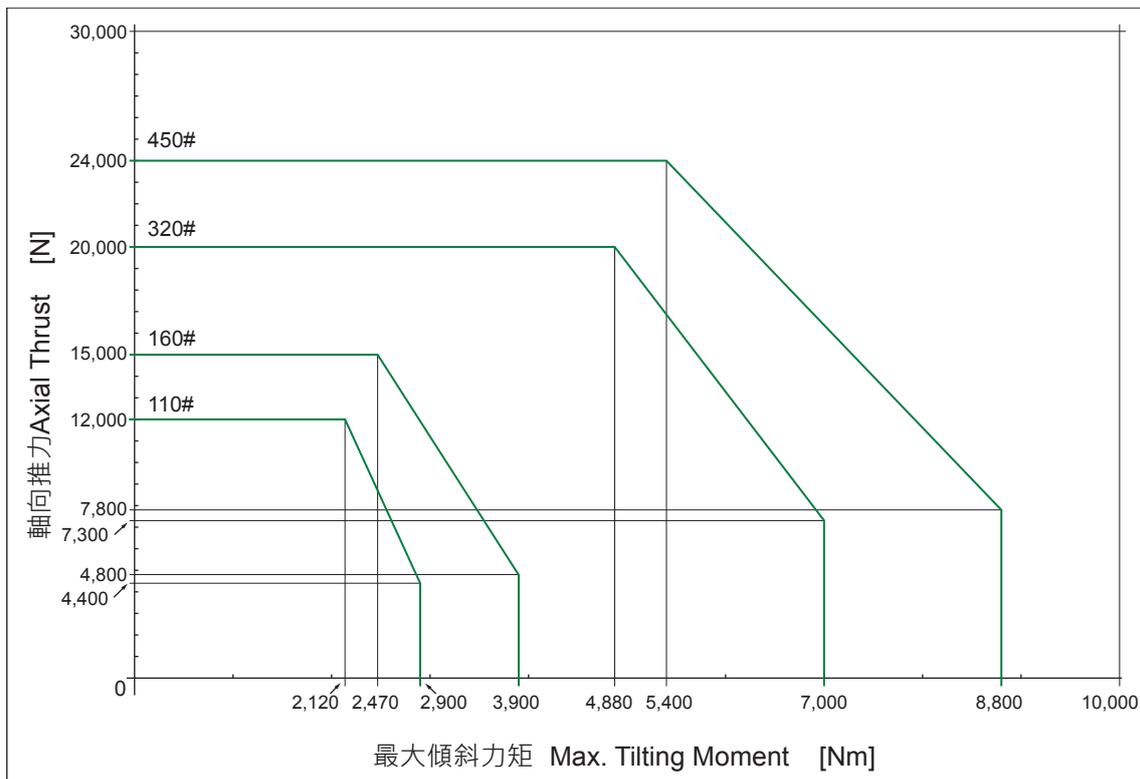
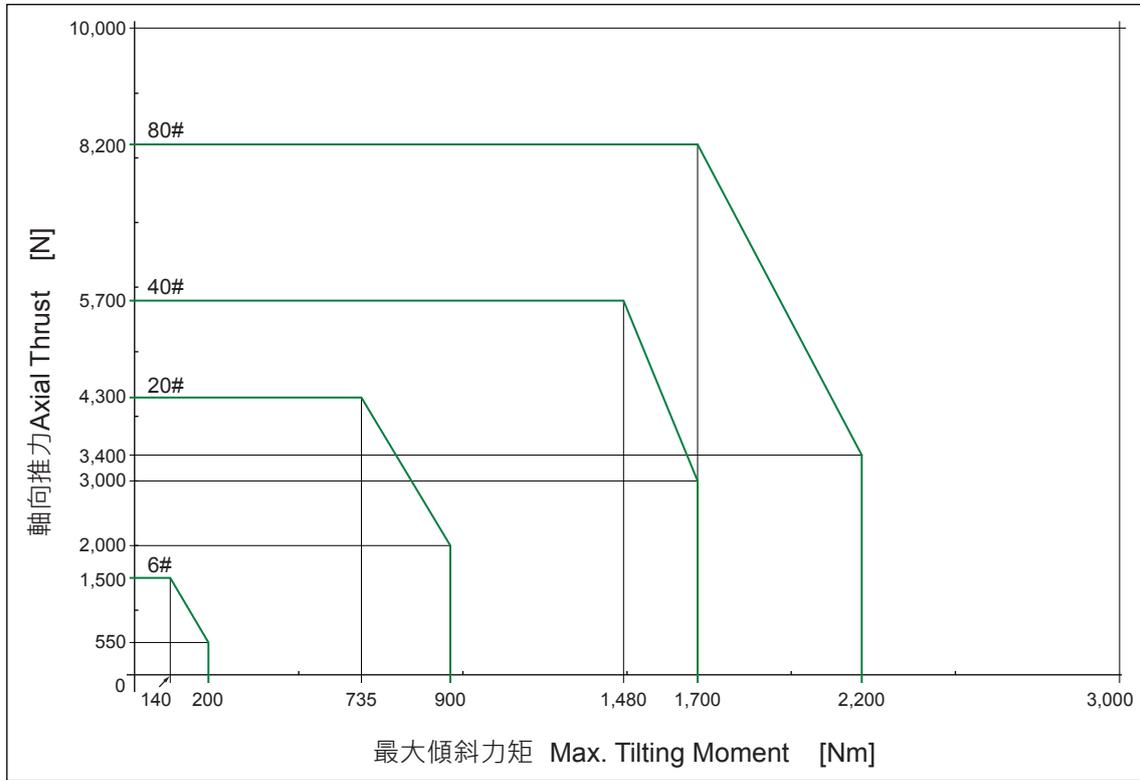
最大傾斜力矩 Max. Tilting Moment

$$M_{2K} = \frac{F_{2a} \cdot Y + F_{2r} \cdot (X + Z2)}{1000}$$

| 型號 Model | 最大傾斜力矩 Max. Tilting Moment Nm |
|-------------|----------------------------------|
| 6 | 200 |
| 20 | 900 |
| 40 | 1,700 |
| 80 | 2,200 |
| 110 | 2,900 |
| 160 | 3,900 |
| 320 | 7,000 |
| 450 | 8,800 |

- M_{2K} : 最大傾斜力矩 Max. Tilting Moment [Nm]
 F_{2r} 、 F_{2a} : 負荷 Weight [N]
 X 、 Y : 到負荷作用點的距離 Distance to Load Point [mm]

最大傾斜力矩曲線圖 Max. Tilting Moment Curve





RDL

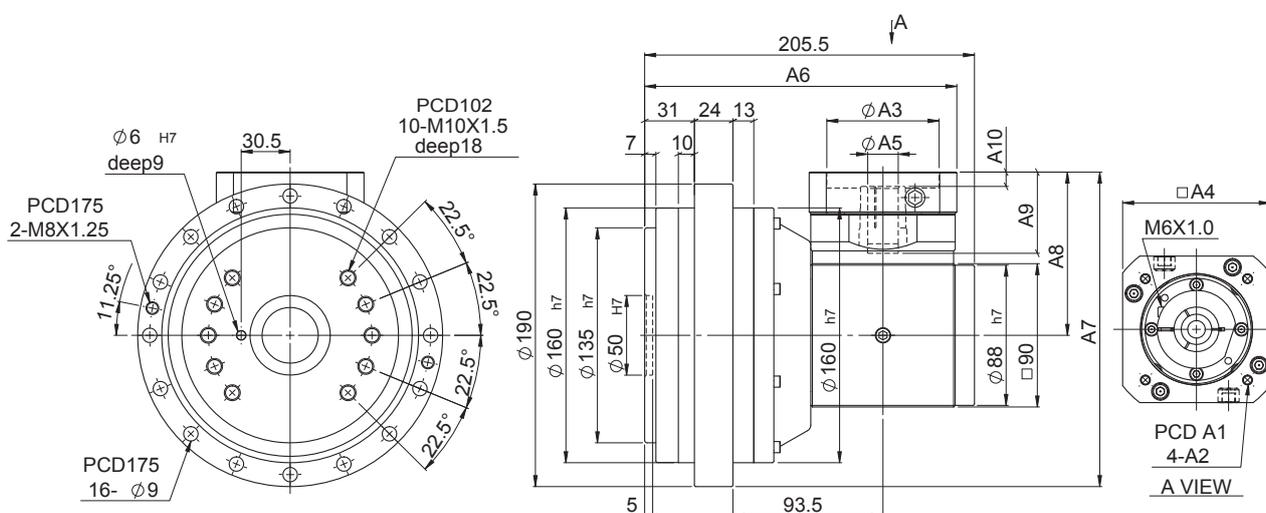
高精度擺線減速機

MODEL : RDL40

RATIO : 41、82、122、162、
183、205、242、305、322、
363、405、483、605、805

Unit: mm

| Model Code | RDL40 |
|------------|-------------------|
| A1 | 90、100、115、145 |
| A2 | M5、M6、M8 |
| A3 | 70、80、95、110 |
| A4 | 92、110、130 |
| A5 | 16、19、22、24 |
| A6 | 194.5、203.5、213.5 |
| A7 | 197.5、212 |
| A8 | 102.5、117 |
| A9 | 51、65.5 |
| A10 | 9、23.5 |



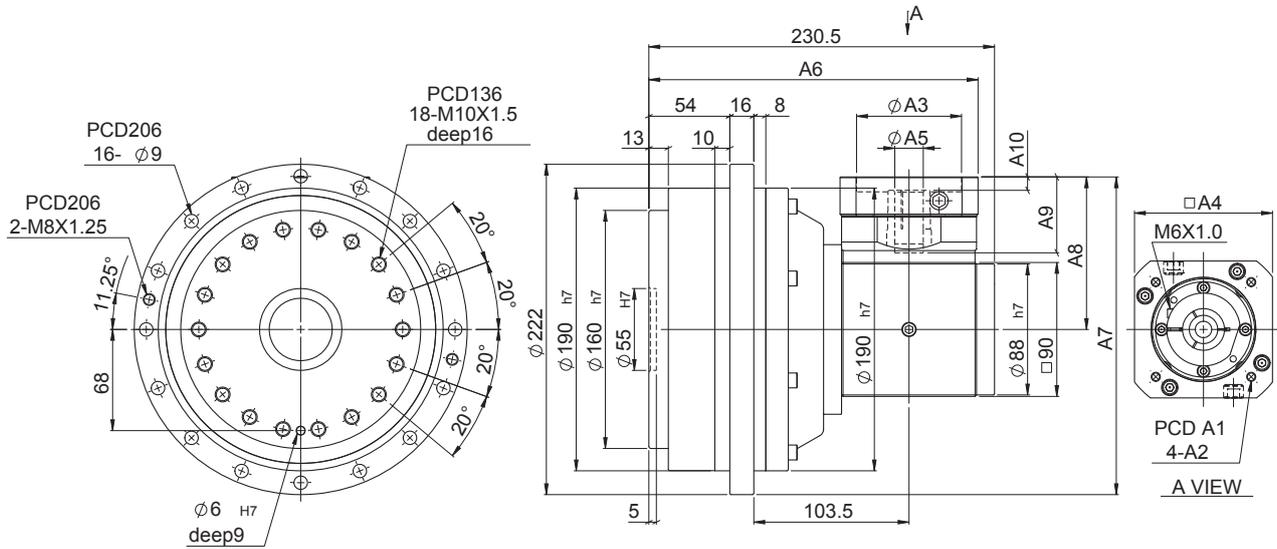
| 特性 Characteristic | 代號 | 單位 Unit | RDL40 |
|---|------------|-------------------|---|
| 輸出平台支撐軸承 / Output Table Supporting Bearing | | | 斜角滾珠軸承 Angular Contact Ball Bearing |
| 額定輸出扭矩 / Rated Output Torque | | Nm | 400 |
| 最大輸出扭矩 / Max. Output Torque 急停扭矩 / Emergency Stop Torque | T_{2NOT} | Nm | 5 倍額定輸出扭矩 5 Time of Rated Output Torque |
| 最大加速力矩 / Max. Acceleration Torque | T_{2B} | Nm | 2.5 倍額定輸出力矩 2.5 Times of Rated Output Torque |
| 慣性慣量 / Inertia Moment | | kg.m ² | 4.93×10^{-4} |
| 額定出力轉速 / Rated Output Speed | | rpm | 15 |
| 最大輸出轉速 / Max. Output Speed | | rpm | 45 |
| 容許輸入轉速 / Permissible Input Speed | | rpm | 3,000 |
| 背隙 / Backlash Ps | J_i | arcmin | ≤ 1 |
| 背隙 / Backlash P0 | J_i | arcmin | ≤ 3 |
| 背隙 / Backlash P1 | J_i | arcmin | ≤ 5 |
| 最大傾斜力矩 Max. Tilting Moment M_{2K} | M_{2K} | Nm | 1,700 |
| 額定壽命 / Rated Life | L_H | hr | S5 周期運轉 : >6,000 (S1 連續運轉 : >3,000 hrs) S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) |
| 扭轉剛性 / Torsional Rigidity | | Nm/arcmin | 108 |
| 效率 / Efficiency | η | % | ≥ 85 |
| 噪音值 / Noise Level | | dB | 76 |
| 重量 / Weight | | kg | 16.3 |

MODEL : RDL80

RATIO : 45、81、90、101、135、162、180、202、225、243、264、303、330、342、405、505、684、855

Unit: mm

| Model Code | RDL80 |
|------------|-------------------|
| A1 | 90、100、115、145 |
| A2 | M5、M6、M8 |
| A3 | 70、80、95、110 |
| A4 | 92、110、130 |
| A5 | 16、19、22、24 |
| A6 | 219.5、228.5、238.5 |
| A7 | 213.5、228 |
| A8 | 102.5、117 |
| A9 | 51、65.5 |
| A10 | 9、23.5 |



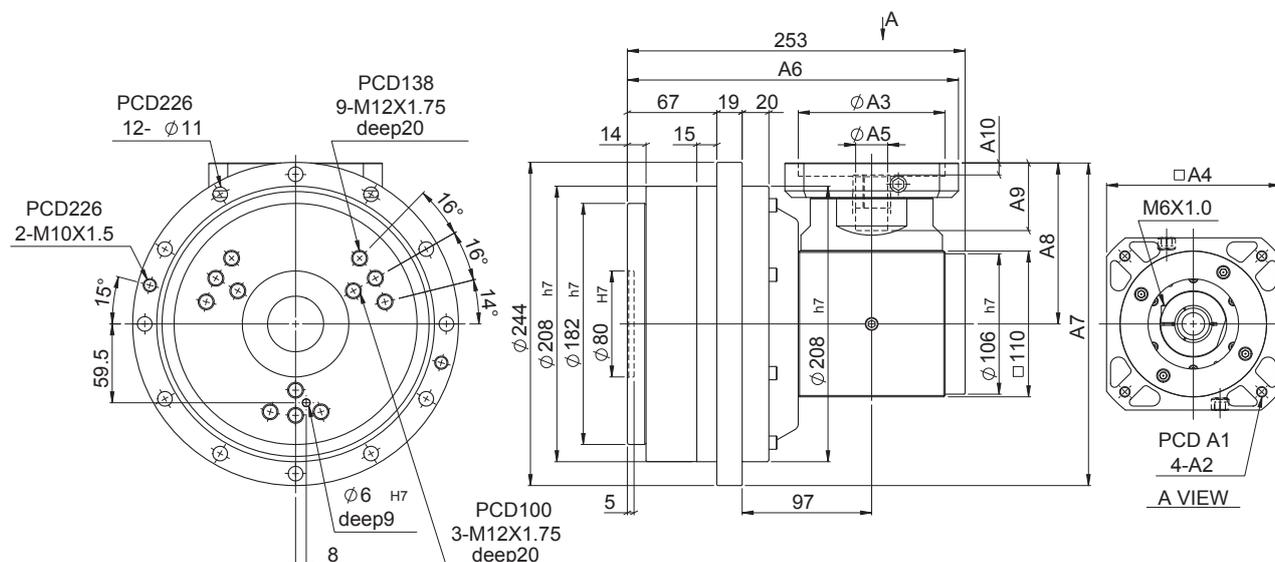
| 特性 Characteristic | 代號 | 單位 Unit | RDL80 |
|---|------------|-------------------|---|
| 輸出平台支撐軸承 / Output Table Supporting Bearing | | | 斜角滾珠軸承 Angular Contact Ball Bearing |
| 額定輸出扭矩 / Rated Output Torque | | Nm | 800 |
| 最大輸出扭矩 / Max. Output Torque 急停扭矩 / Emergency Stop Torque | T_{2NOT} | Nm | 5 倍額定輸出扭矩 5 Time of Rated Output Torque |
| 最大加速力矩 / Max. Acceleration Torque | T_{2B} | Nm | 2.5 倍額定輸出力矩 2.5 Times of Rated Output Torque |
| 慣性慣量 / Inertia Moment | | kg.m ² | 4.93×10^{-4} |
| 額定出力轉速 / Rated Output Speed | | rpm | 15 |
| 最大輸出轉速 / Max. Output Speed | | rpm | 42 |
| 容許輸入轉速 / Permissible Input Speed | | rpm | 3,000 |
| 背隙 / Backlash Ps | J_i | arcmin | ≤ 1 |
| 背隙 / Backlash P0 | J_i | arcmin | ≤ 3 |
| 背隙 / Backlash P1 | J_i | arcmin | ≤ 5 |
| 最大傾斜力矩 Max. Tilting Moment M_{2K} | M_{2K} | Nm | 2,200 |
| 額定壽命 / Rated Life | L_H | hr | S5 周期運轉 : >6,000 (S1 連續運轉 : >3,000 hrs) S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) |
| 扭轉剛性 / Torsional Rigidity | | Nm/arcmin | 196 |
| 效率 / Efficiency | η | % | ≥ 85 |
| 噪音值 / Noise Level | | dB | 76 |
| 重量 / Weight | | kg | 19.5 |

MODEL : RDL110

RATIO : 41、82、122、162、
183、205、242、305、322、
363、405、483、605、805

Unit: mm

| Model Code | RDL110 |
|------------|----------------|
| A1 | 90、100、115、145 |
| A2 | M5、M6、M8 |
| A3 | 70、80、95、110 |
| A4 | 92、110、130 |
| A5 | 19、22、24 |
| A6 | 229、238、248 |
| A7 | 243.5、258 |
| A8 | 121.5、136 |
| A9 | 51、65.5 |
| A10 | 9、23.5 |



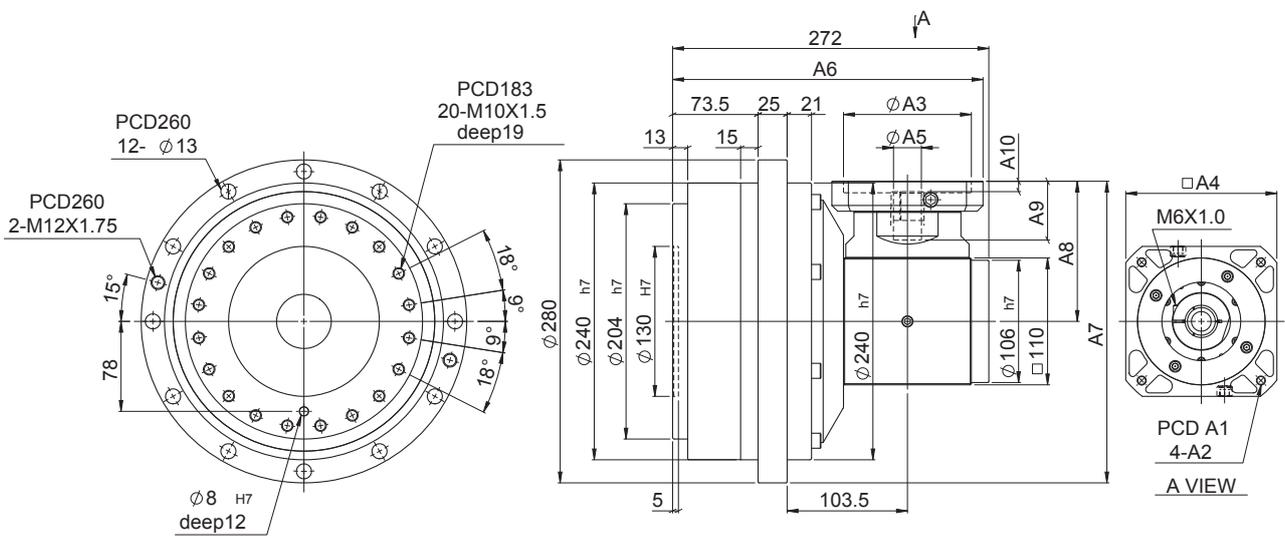
| 特性 Characteristic | 代號 | 單位 Unit | RDL110 |
|---|------------|-------------------|---|
| 輸出平台支撐軸承 / Output Table Supporting Bearing | | | 斜角滾珠軸承 Angular Contact Ball Bearing |
| 額定輸出扭矩 / Rated Output Torque | | Nm | 1,100 |
| 最大輸出扭矩 / Max. Output Torque 急停扭矩 / Emergency Stop Torque | T_{2NOT} | Nm | 5 倍額定輸出扭矩 5 Time of Rated Output Torque |
| 最大加速力矩 / Max. Acceleration Torque | T_{2B} | Nm | 2.5 倍額定輸出力矩 2.5 Times of Rated Output Torque |
| 慣性慣量 / Inertia Moment | | kg.m ² | 12.5 x 10 ⁻⁴ |
| 額定出力轉速 / Rated Output Speed | | rpm | 15 |
| 最大輸出轉速 / Max. Output Speed | | rpm | 35 |
| 容許輸入轉速 / Permissible Input Speed | | rpm | 3,000 |
| 背隙 / Backlash Ps | J_i | arcmin | ≤ 1 |
| 背隙 / Backlash P0 | J_i | arcmin | ≤ 3 |
| 背隙 / Backlash P1 | J_i | arcmin | ≤ 5 |
| 最大傾斜力矩 Max. Tilting Moment M_{2K} | M_{2K} | Nm | 2,900 |
| 額定壽命 / Rated Life | L_H | hr | S5 周期運轉 : >6,000 (S1 連續運轉 : >3,000 hrs) S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) |
| 扭轉剛性 / Torsional Rigidity | | Nm/arcmin | 294 |
| 效率 / Efficiency | η | % | ≥ 85 |
| 噪音值 / Noise Level | | dB | 78 |
| 重量 / Weight | | kg | 28.3 |

Unit: mm

MODEL : RDL160

RATIO : 41、82、122、162、
183、205、242、305、322、
363、405、483、605、805

| Model Code | RDL160 |
|------------|----------------|
| A1 | 90、100、115、145 |
| A2 | M5、M6、M8 |
| A3 | 70、80、95、110 |
| A4 | 92、110、130 |
| A5 | 19、22、24 |
| A6 | 248、257、267 |
| A7 | 261.5、276 |
| A8 | 121.5、136 |
| A9 | 51、65.5 |
| A10 | 9、23.5 |



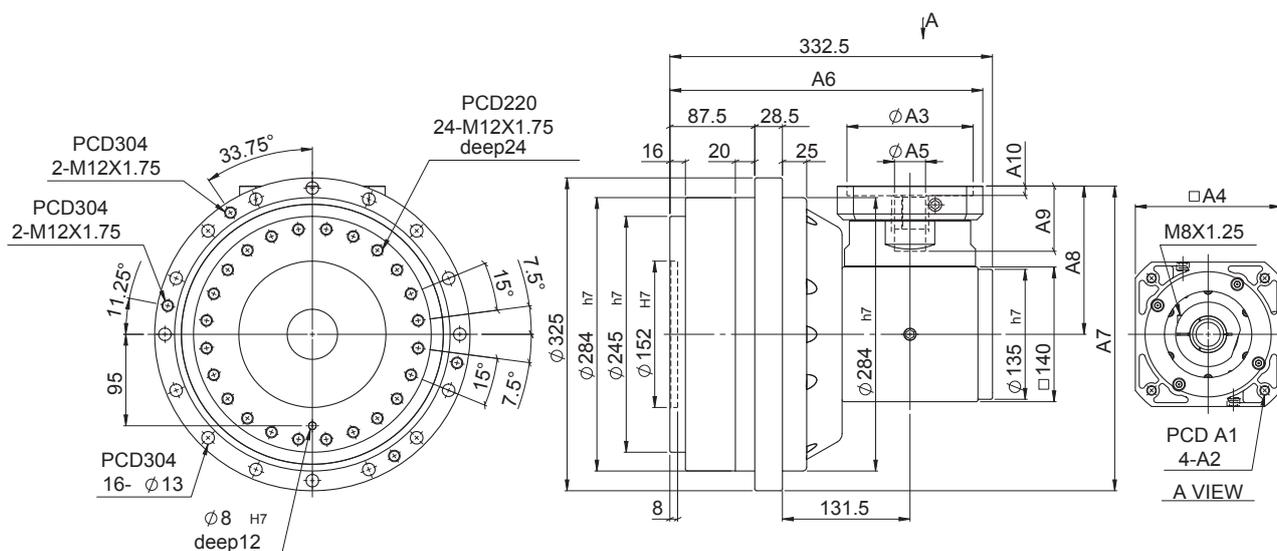
| 特性 Characteristic | 代號 | 單位 Unit | RDL160 |
|---|------------|-------------------|---|
| 輸出平台支撐軸承 / Output Table Supporting Bearing | | | 斜角滾珠軸承 Angular Contact Ball Bearing |
| 額定輸出扭矩 / Rated Output Torque | | Nm | 1,600 |
| 最大輸出扭矩 / Max. Output Torque 急停扭矩 / Emergency Stop Torque | T_{2NOT} | Nm | 5 倍額定輸出扭矩 5 Time of Rated Output Torque |
| 最大加速力矩 / Max. Acceleration Torque | T_{2B} | Nm | 2.5 倍額定輸出力矩 2.5 Times of Rated Output Torque |
| 慣性慣量 / Inertia Moment | | kg.m ² | 12.5 x 10 ⁻⁴ |
| 額定出力轉速 / Rated Output Speed | | rpm | 15 |
| 最大輸出轉速 / Max. Output Speed | | rpm | 27 |
| 容許輸入轉速 / Permissible Input Speed | | rpm | 3,000 |
| 背隙 / Backlash Ps | J_i | arcmin | ≤ 1 |
| 背隙 / Backlash P0 | J_i | arcmin | ≤ 3 |
| 背隙 / Backlash P1 | J_i | arcmin | ≤ 5 |
| 最大傾斜力矩 Max. Tilting Moment M_{2K} | M_{2K} | Nm | 3,900 |
| 額定壽命 / Rated Life | L_H | hr | S5 周期運轉 : >6,000 (S1 連續運轉 : >3,000 hrs) S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) |
| 扭轉剛性 / Torsional Rigidity | | Nm/arcmin | 392 |
| 效率 / Efficiency | η | % | ≥ 85 |
| 噪音值 / Noise Level | | dB | 78 |
| 重量 / Weight | | kg | 38.9 |

MODEL : RDL320

RATIO : 41、82、122、162、
183、205、242、305、322、
363、405、483、605、805

Unit: mm

| Model Code | RDL320 |
|------------|-------------------|
| A1 | 115、145、165 |
| A2 | M6、M8、M10 |
| A3 | 95、110、130 |
| A4 | 122、130、150 |
| A5 | 24、28、32、35 |
| A6 | 308.5、312.5、322.5 |
| A7 | 316.5、331 |
| A8 | 154、168.5 |
| A9 | 68、82 |
| A10 | 10 |



| 特性 Characteristic | 代號 | 單位 Unit | RDL320 |
|---|------------|-------------------|---|
| 輸出平台支撐軸承 / Output Table Supporting Bearing | | | 斜角滾珠軸承 Angular Contact Ball Bearing |
| 額定輸出扭矩 / Rated Output Torque | | Nm | 3,200 |
| 最大輸出扭矩 / Max. Output Torque 急停扭矩 / Emergency Stop Torque | T_{2NOT} | Nm | 5 倍額定輸出扭矩 5 Time of Rated Output Torque |
| 最大加速力矩 / Max. Acceleration Torque | T_{2B} | Nm | 2.5 倍額定輸出力矩 2.5 Times of Rated Output Torque |
| 慣性慣量 / Inertia Moment | | kg.m ² | 36.8×10^{-4} |
| 額定出力轉速 / Rated Output Speed | | rpm | 15 |
| 最大輸出轉速 / Max. Output Speed | | rpm | 21 |
| 容許輸入轉速 / Permissible Input Speed | | rpm | 3,000 |
| 背隙 / Backlash Ps | J_i | arcmin | ≤ 1 |
| 背隙 / Backlash P0 | J_i | arcmin | ≤ 3 |
| 背隙 / Backlash P1 | J_i | arcmin | ≤ 5 |
| 最大傾斜力矩 Max. Tilting Moment M_{2K} | M_{2K} | Nm | 7,000 |
| 額定壽命 / Rated Life | L_H | hr | S5 周期運轉 : >6,000 (S1 連續運轉 : >3,000 hrs) S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) |
| 扭轉剛性 / Torsional Rigidity | | Nm/arcmin | 980 |
| 效率 / Efficiency | η | % | ≥ 85 |
| 噪音值 / Noise Level | | dB | 80 |
| 重量 / Weight | | kg | 68.3 |

