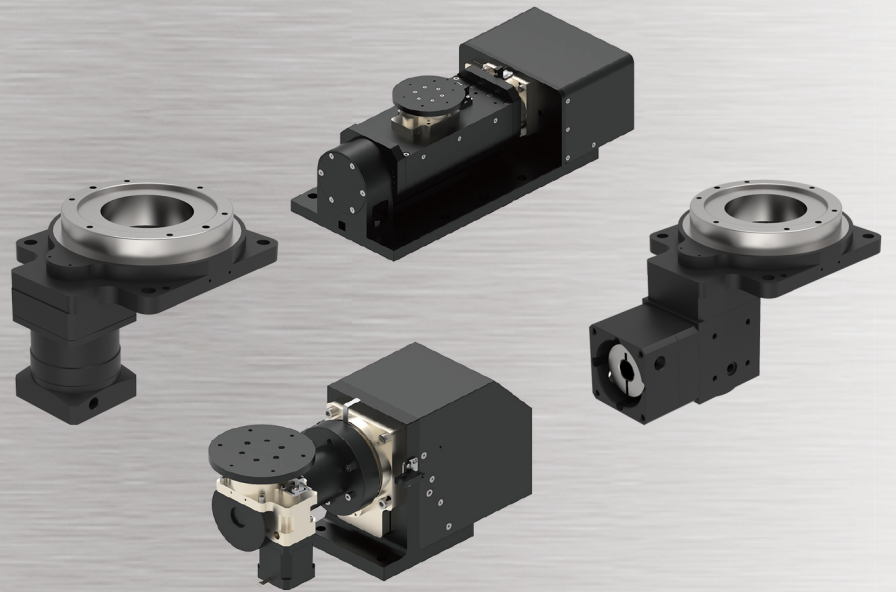
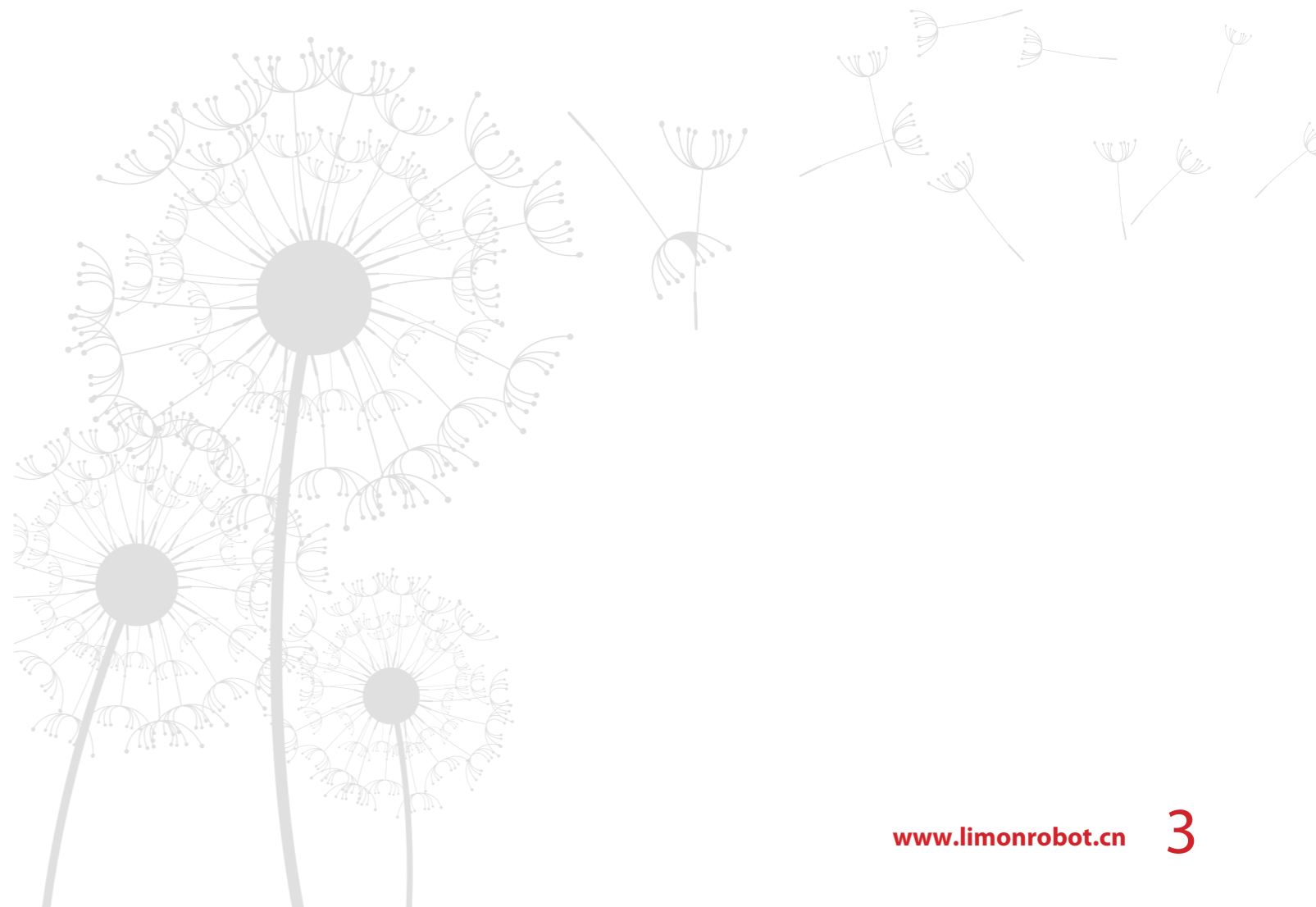


*LINEAR PRECISION*

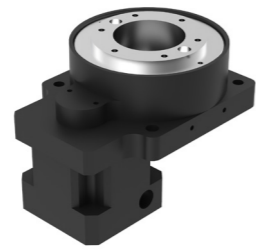
*LINEAR SPEED*





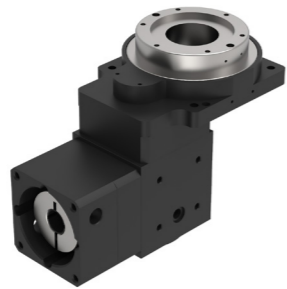
應用案例及產品特征 Application Examples & Features

DY60 Series



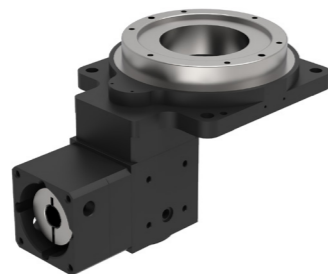
P4-P8

DY85 Series



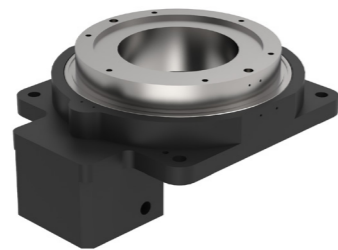
P9-P14

DY130 Series



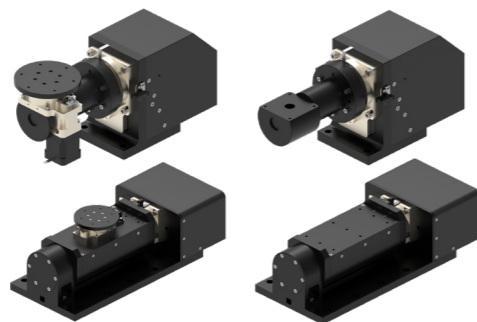
P15-P20

DY200 Series



P21-P25

MDR/MDA  
MDC/MDL  
Series

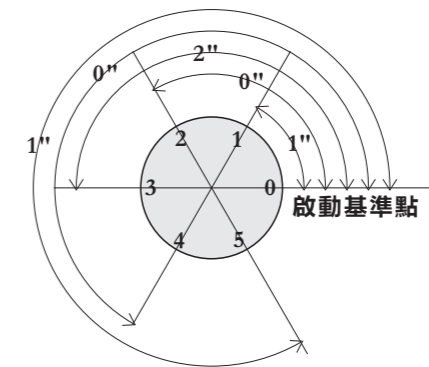


P26-P27

马达安装说明 Instructions of Motor Mounting

P28-P31

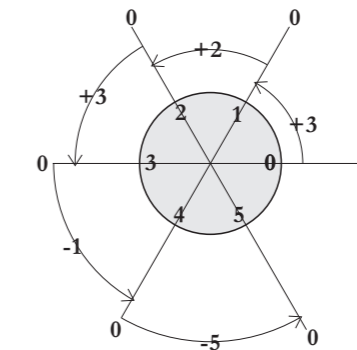
用語解說 Glossary Of Technical Terms



重複定位精度 / Repeated positioning accuracy

以起動基準點設定為“0”點，做任何不同角度之往復運動，其每次回到啟動點的精度誤差值為“重複定位精度”所標示之數值。

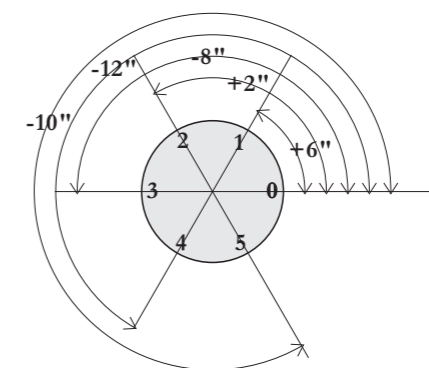
Set the starting reference point as "0" point, which make reciprocating motion at any different angle, and the precision error value of each moving point is the "Repeated positioning accuracy", as marked.



相對精度 / Relative accuracy

每次的啟動點，均視為“0”點，由此點轉動至下一個停止點的角度誤差值為“相對精度”標示，下次再啟動旋轉所設定的角度時，以目前的停止點，視為新的“0”點。

Each starting point is regarded as "0" point, the angular error from this point to the next stop point is the marked "Relative accuracy". When the next time the rotation is started, the current stop point will be regarded as the new "0" point.



絕對精度 / Absolute accuracy

以同一個啟動點的設定：經任意角度旋轉的單向定位精度皆處於“絕對精度”的範圍內。

The setting of the same starting point: the single positioning accuracy rotated by any angle is within the range of "Absolute accuracy".

註：圖表中的數據為範圍數字，實際值請參閱“規格表”

Note: the data in the chart are sample data, please refer to the specification table for actual values.

### 应用案例 Application Examples

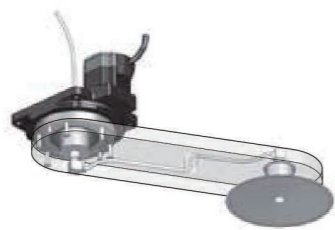
#### 高性能、高剛性的用途

High performance & stiffness application

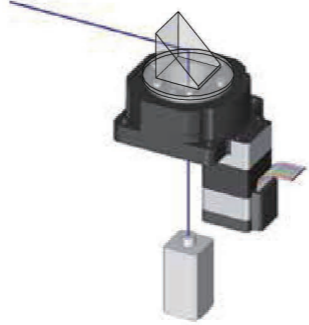
- 負載慣性產生變化的用途  
Applications subject to changing load inertia



- 施以慣量載重的用途  
Applications where a moment load is applied



- 光學用途  
Optical applications using the hollow hole



- 高精度定位用途

High accuracy positioning applications



- 利用中空孔的高精度定位用途

High accuracy positioning applications using the hollow hole



#### 安裝方向自由設計

Flexible design of assembling direction

DY 旋轉平台除水平安裝外，還可以垂直安裝或倒掛安裝，裝置設計的範圍較廣。

DY rotary platform can be assembled in vertical direction or upside down direction as well as the parallel direction.

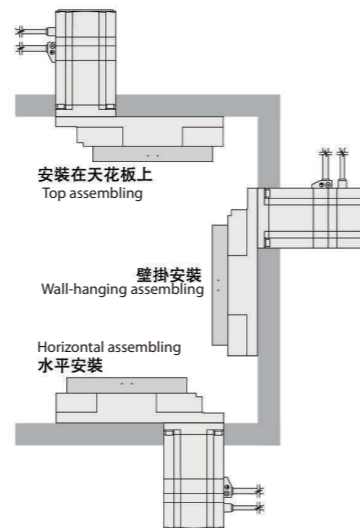
使用時注意事項：

中空旋轉式傳動裝置偶爾會有少量潤滑油滲出。如潤滑油滲出導致周圍環境污染，請在定期檢查時進行確認或安裝接油盤等裝置。

Note:

Hollow rotary drive system will occur the exudation of few lubrication oil.

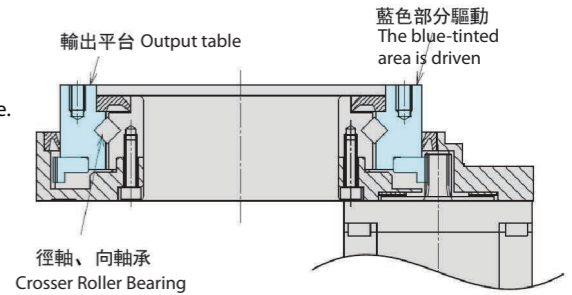
If the oil result in the environmental pollution, please check regularly or assemble the oil-receiving tray.



### 产品特征 Features

- 一體型產品 Integrated Products

DY 系列為組合中空旋轉平台與伺服馬達的產品。平台內部為減速比構造，可實現高輸出驅動。  
DY series are combined with hollow rotary actuators platform and servo motor. Inside are reduction ratio device which can achieve high output drive.



- 短時間定位 Short Positioning Time

可在短時間內實現慣性負載的定位。  
It can realize inertia load positioning in a short time.

- 無齒隙的高精度定位  
High Accuracy Positioning With Zero Backlash

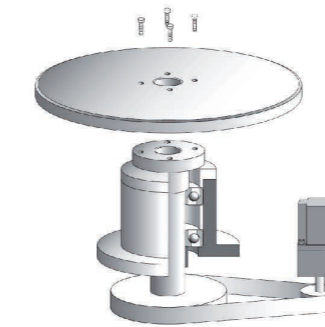
無齒隙，螺旋斜齒，研磨機齒輪：齒輪模數大，實現高扭矩反復定位精度  $\pm 15\text{arcsec}$  ( $\pm 0.04^\circ$ )

\*精度是在一定負載、一定溫度（常溫）下的數值。

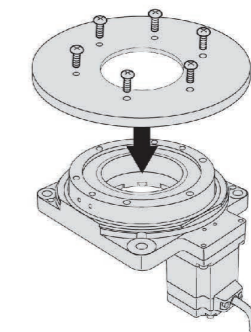
Zero backlash, spiral gear, grinding machine gear: high tooth module to achieve high torque. Repetitive Accuracy:  $\pm 15\text{arcsec}$  ( $\pm 0.04^\circ$ )  
Note: The repetitive positioning accuracy is measured at a constant temperature (normal temperature) under a constant load.

- 減少設計時間，縮短交期 Reduce Design Time And Shorten The Delivery .

輸出平台可直接安裝設備的工作台或機械手臂，與使用皮帶、皮帶輪等機械零件時比較，可以減少機構設計。零件調配、皮帶張力調整等時間及成本節省設備設計時間，有助於縮短交期。  
Equipment tables and arms can be installed directly on the output table. This saves you the hassle and cost of designing an installation mechanism, arranging necessary parts, adjusting the belt tension, etc. when mechanical parts such as belt and pulley are used for installation.



馬達+機構部件  
(另行設計、安排)  
Motor+mechanical parts (designed and arranged separately)

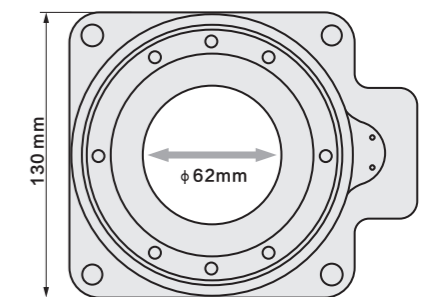


一體化設計  
(結合伺服電機型產品)  
Integrated product (combined with servo motor products)

- 大口徑中空輸出平台節省配線與配管  
Large-Diameter, Hollow Output Table Makes Simple Wiring and Piping Possible

大口徑的中空孔（貫穿）可利用在環境複雜的配線管上，可簡化設備設計。  
The large diameter hollow hole (through-hole) helps reduce the complexity of wiring and piping, thus simplifying your equipment design.

	安裝尺寸mm Frame Size	中空徑 Diameter of Hollow Section
DY60	60	$\phi 28$
DY85	85	$\phi 33$
DY130	130	$\phi 62$
DY200	200	$\phi 100$





### 产品特征 Features

#### 高輸出 高剛性 High Power and Rigidity

Standard Type的輸出平台軸承使用徑、軸向軸承，實現了高載重、高剛性。

<輸出> 最大容許慣量 200N·m

<剛性> 最大容許軸心方向載重 500N·m

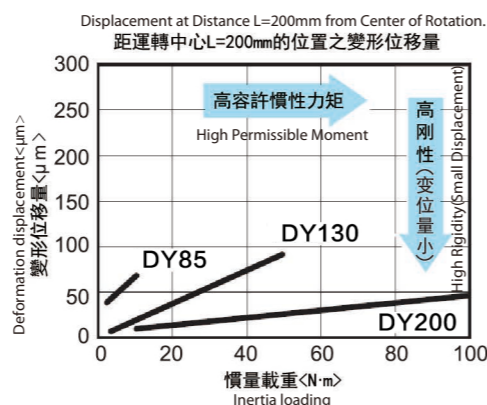
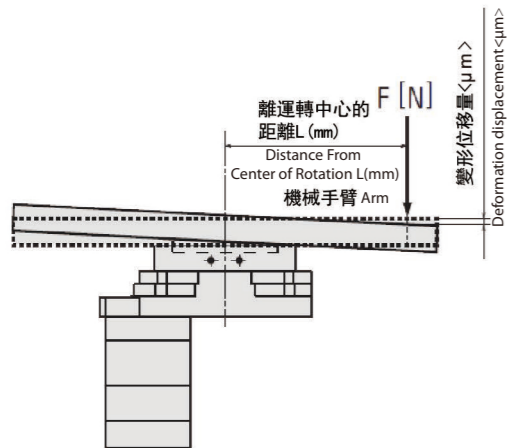
型號越大容許慣量越大，相對於負載慣量的變形位移量就越小。

The standard type-hollow output table is integrated with a high rigidity cross roller bearing to achieve high load and high rigidity.

<output>max permissible inertia 200N·m

<rigidity>max permissible load in axis direction 500N·m.

Larger size with bigger permissible inertia ,and smaller deformation displacement relative to load inertia .



#### 高剛性 High Rigidity

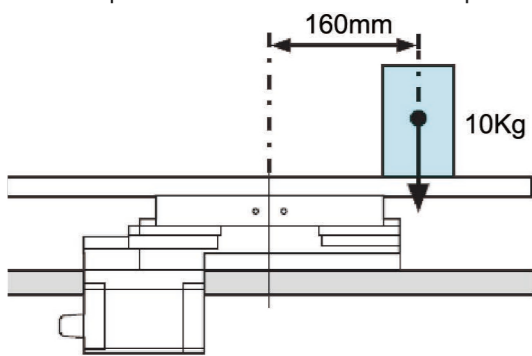
在距離平台中央部160mm的位置有10kg的工作物時，慣重為 15.7N·m。

When there is 10kg object working in the place which is distant 160mm from center plate,the inertia is 15.7N·m

$$10\text{kg} \times \text{gm/s}^2 \times 0.16\text{m} = 15.7\text{N} \cdot \text{m}$$

DY200的容許慣重為200N·m，在容許值以內。

The DY200's permissible inertia is 200N·m within the permissible value.



#### 高剛性 High Rigidity

品名: DY200-10 電源輸入: AC200V

Name: DY200-10 Input Power: AC200V

搬運重量: 91kg (工作物6個+平台)

: 工作物10kg/個 × 6個

: 平台31kg

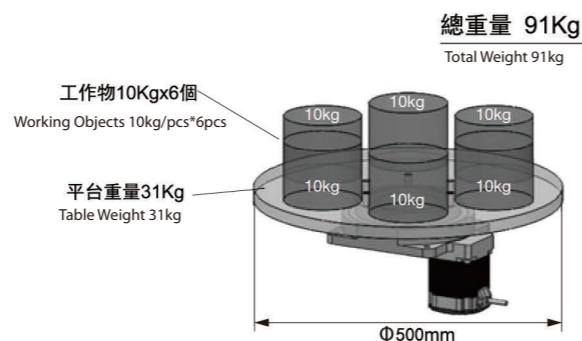
(直徑500mm、厚度200mm、鐵質)

Weight: 91kg(working objects 6pcs+table)

working objects 10kg/pcs\*6pcs

table 31kg

(diameter 500mm,thickness 200mm,Iron Material)



#### 擁有【原點檢知器套件】的選購配件 Home Sensor Suite Available for Optional Accessories

由於原點設定所需的零件齊全，因此可節省安裝檢知器的設計、製造、零件調配時間。

As the complete parts of home position setup ,the time regarding design,manufacturing,parts allocation of assembling sensor can be saved.

#### 搭配方便 Easy Match

可任意搭配任何品牌的伺服馬達或步進馬達。

It can be matched with any brand of servo motor or stepper motor.

### 訂購型號代碼 Code

**DY 60 - R - 5 - V1**

產品規格  
Specification

馬達連接方式  
Motor Connecting Method

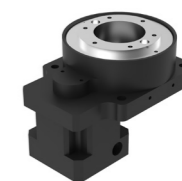
減速比  
Reduction Ratio

馬達類型  
Motor Type

F: 直結式  
F: Direct  
R: 一體式直角轉向  
R: Integrated Right Angle Turning  
P: 一體式行星減速機直連  
P: Integrated Planetary Reducer

5  
10  
15  
20  
30  
40

V1: 伺服 φ8 PCD45,M3  
V1: Servo φ8 PCD45,M3  
V2: 伺服 φ8 PCD46,M4  
V2: Servo φ8 PCD46,M4  
各廠牌100W AC 伺服馬達  
Factory Brand 100W AC Servo Motor  
T1: 步進 φ5 PCD43.8,M3  
T1: Stepper φ5 PCD43.8,M3  
T2: 步進 φ6 PCD43.8,M3  
T2: Stepper φ6 PCD43.8,M3  
5A: 含步進馬達 42H5K-2  
5A: Include Stepper Motor 42H5K-2  
各廠牌42型步進馬達  
All Kinds of Type 42 Stepper Motor

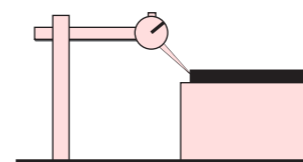


### 技術參數 Technical Parameters

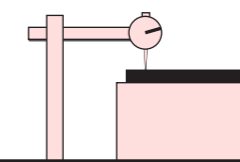
產品型號 Model Type	DY60-F	DY60-P	DY60-R
減速比 Reduction Ratio	5,10	20,40	15,30
容許轉矩 (N·m) Permissible Torque (N·m)	5		
轉動慣量(kg.m <sup>2</sup> ) Moment of Inertia (kg.m <sup>2</sup> )	4320*10 <sup>-7</sup>		
容許軸向負載 (N) Permissible Axial Load (N)	100		
容許慣性力矩負荷 (N.M) Permissible Inertia Moment Load(N.M)	5		
重複定位精度(arc-sec) Repetitive Accuracy(arc-sec)	≤15	≤30	≤30
定位精度(arc-min) Positioning Accuracy(arc-min)	≤1		
旋轉平臺平行度(mm) Rotary Plate Parallelism(mm)	≤0.02		
旋轉平臺同心度(mm) Rotary Plate Concentricity(mm)	≤0.02		
精度壽命(H) Accuracy Life(H)	15000		
允許轉速(RPM) Permissible Revolution Speed(RPM)	200 (盤面 Round Plate)		
重量(KG) Weight(KG)	0.65	1	1
防護等級 Protection Grade	IP40		

### Module Dimension

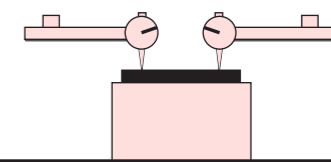
盤面同心度檢測  
Round Plate Concentricity Testing  
≤0.02mm



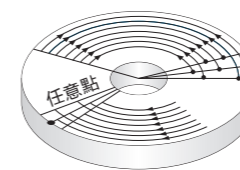
盤面旋轉振幅  
Round Plate Rotary Amplitude of Vibration  
≤0.02mm



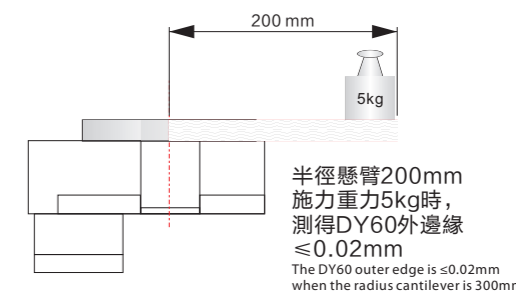
盤面與底座平行度  
Round Plate&Base Parallelism  
≤0.02mm



外徑任意點定位精度  
Positioning Accuracy of Arbitrary Point in Outer Diameter.  
半徑30mm  
Radius 30mm  
≤1min

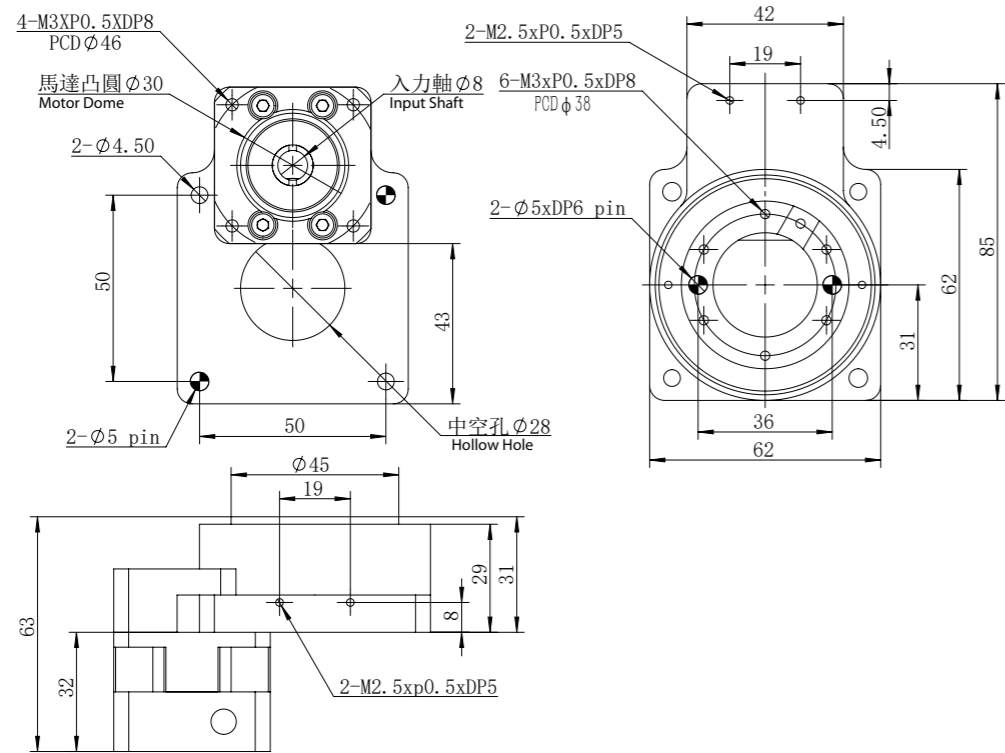


反覆定位精度  
Repetitive Accuracy Radius  
半徑30mm  
Radius 30mm  
≤15sec

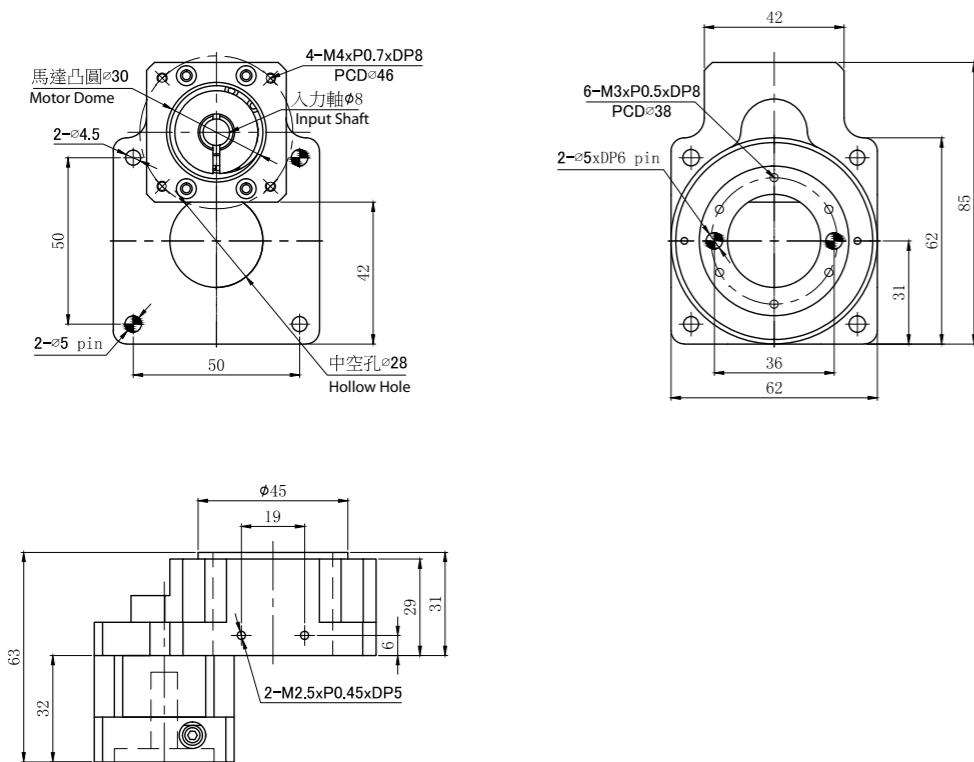


### 產品尺寸 Module Dimension

#### DY60F-5/10-V1

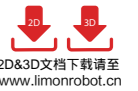
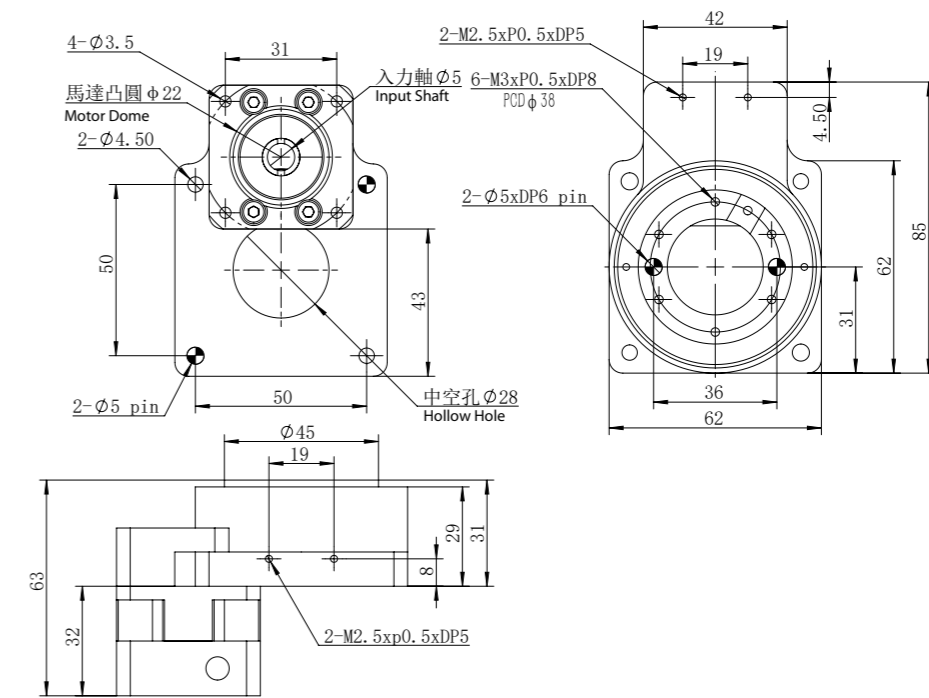
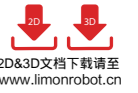


#### DY60F-5/10-V2

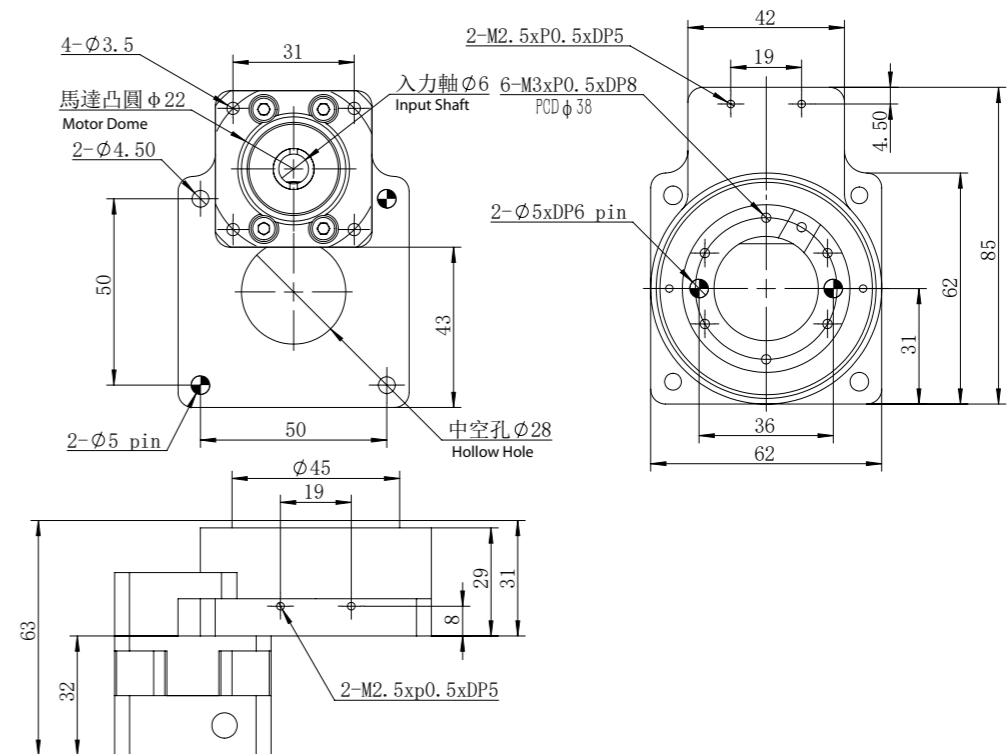


### 產品尺寸 Module Dimension

#### DY60F-5/10-T1

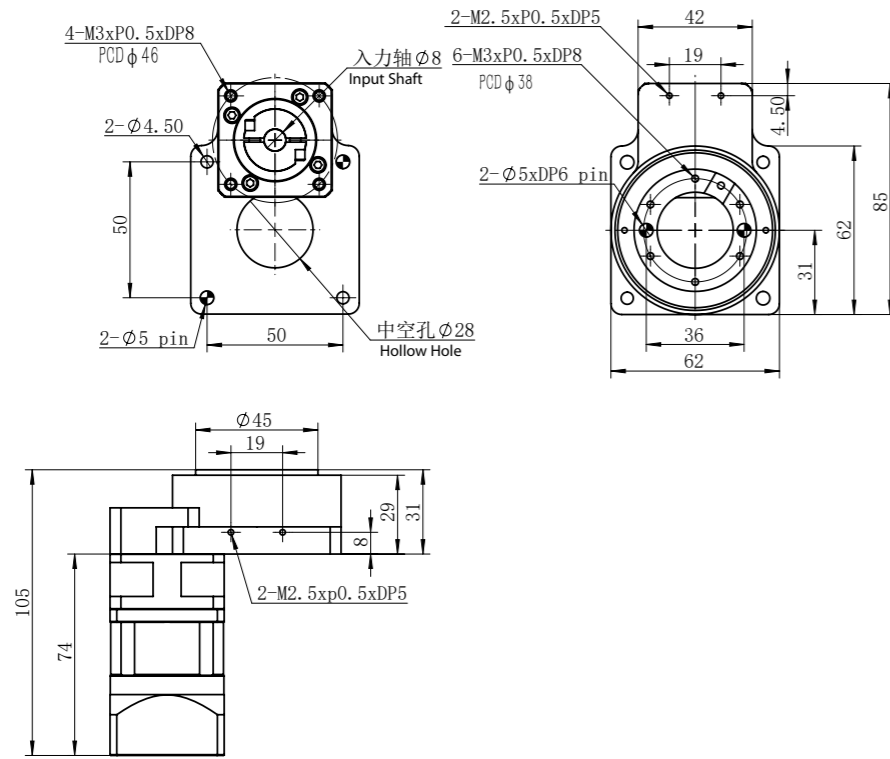


#### DY60F-5/10-T2

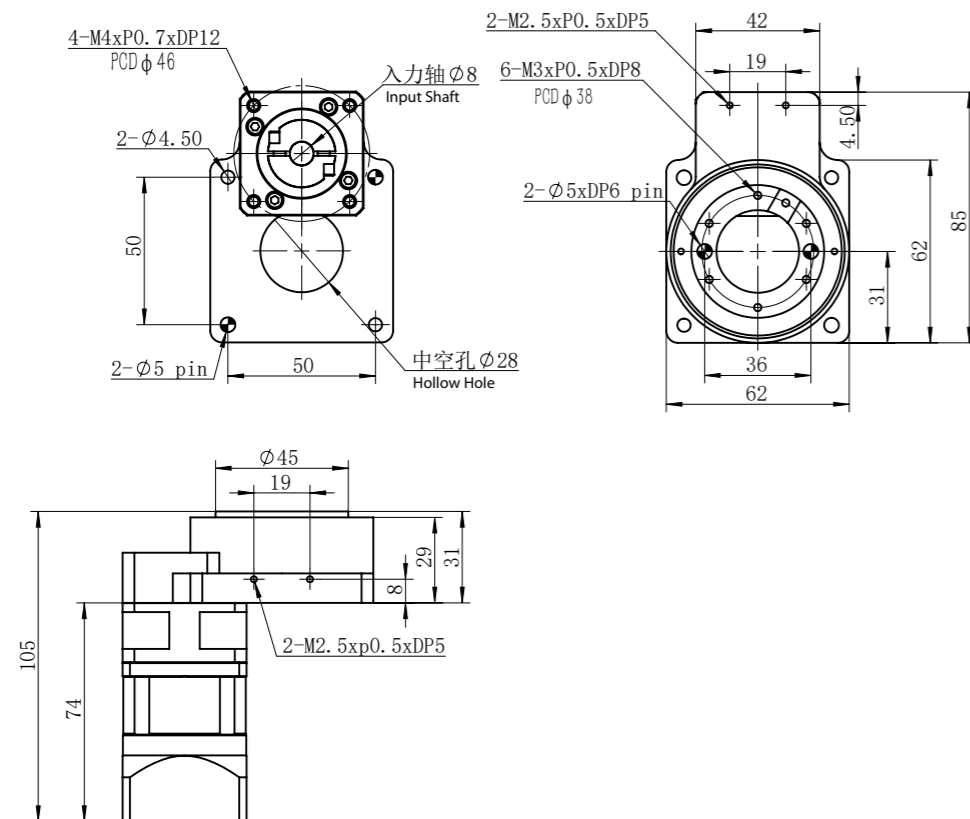


### 產品尺寸 Module Dimension

#### DY60P-20/40-V1

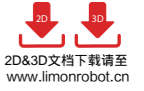
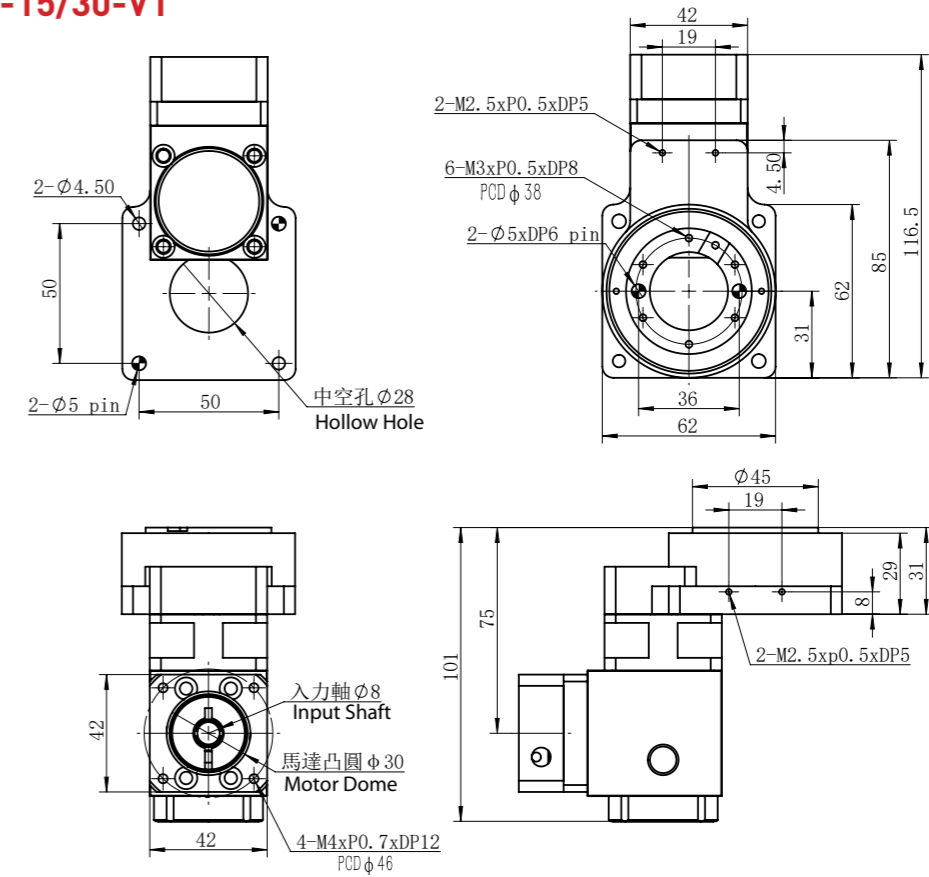


#### DY60P-20/40-V2

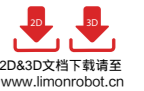
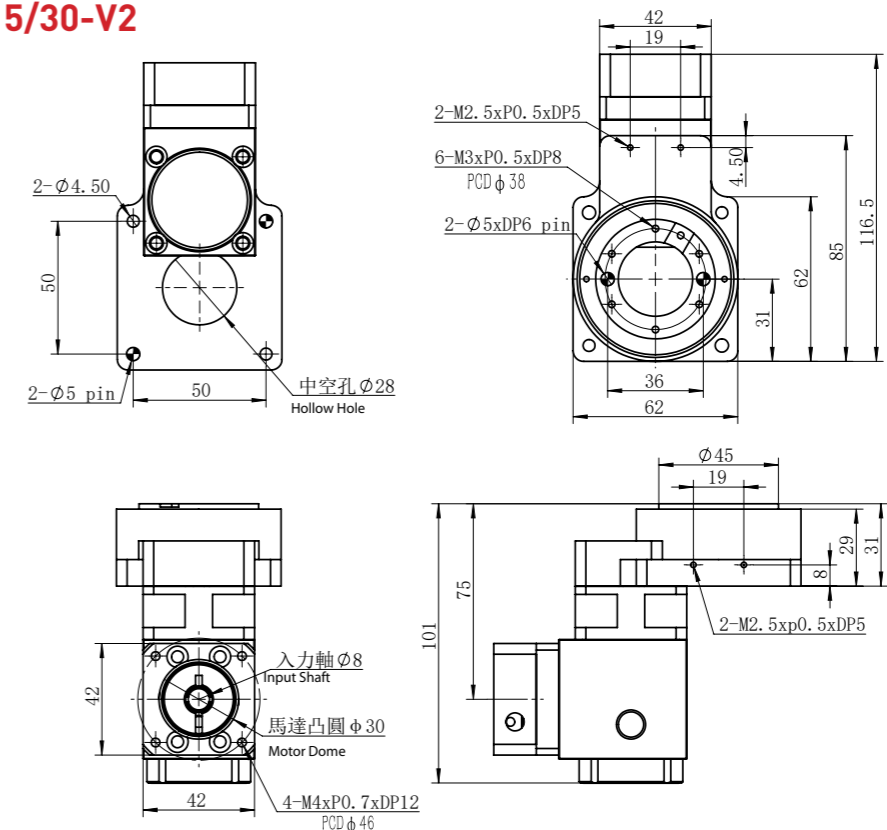


### 產品尺寸 Module Dimension

#### DY60R-15/30-V1

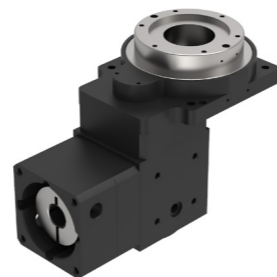


#### DY60R-15/30-V2



### 訂購型號代碼 Code

**DY 85 - R - 5 - V1**



#### 產品規格 Specification

#### 馬達連接方式 Motor Connecting Method

F: 直結式  
F: Direct  
R: 一體式直角轉向  
R: Integrated Right Angle Turning  
P: 一體式行星減速機直連  
P: Integrated Planetary Reducer

#### 減速比 Reduction Ratio

5  
10  
15  
18  
20  
30  
40  
54  
72

#### 馬達類型 Motor Type

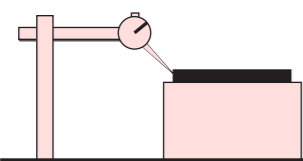
V1: 伺服  $\phi 14$  PCD70,M4  
V1: Servo  $\phi 14$  PCD70,M4  
V2: 伺服  $\phi 14$  PCD70,M5  
V2: Servo  $\phi 14$  PCD70,M5  
各廠牌200~400W AC 伺服馬達  
Factory Brand 200~400W AC Servo Motor  
T1: 步進  $\phi 8$  PCD66.67,M4  
T1: Stepper  $\phi 8$  PCD66.67,M4  
T2: 步進  $\phi 8$  PCD70,M4  
T2: Stepper  $\phi 8$  PCD70,M4  
T3: 步進  $\phi 10$  PCD70,M4  
T3: Stepper  $\phi 10$  PCD70,M4  
各廠牌60型步進馬達  
All Kinds of Type 60 Stepper Motor

### 技術參數 Technical Parameters

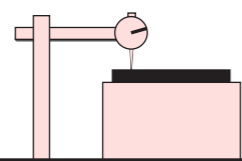
產品型號 Model Type	DY85-F	DY85-P	DY85-R
減速比 Reduction Ratio	5,10,18	20,40,72	15,30,54
容許轉矩(N·m) Permissible Torque (N·m)		15	
轉動慣量(kg·m <sup>2</sup> ) Moment of Inertia (kg·m <sup>2</sup> )		22090*10 <sup>-7</sup>	
容許軸向負載(N) Permissible Axial Load(N)		500	
容許慣性力矩負荷(N.M) Permissible Inertia Moment Load(N.M)		10	
重複定位精度(arc-sec) Repetitive Accuracy(arc-sec)	≤15	≤30	≤60
定位精度(arc-min) Positioning Accuracy(arc-min)		≤1	
旋轉平臺平行度(mm) Rotary Plate Parallelism(mm)		≤0.02	
旋轉平臺同心度(mm) Rotary Plate Concentricity(mm)		≤0.02	
精度壽命(H) Accuracy Life(H)		20000	
允許轉速(RPM) Permissible Revolution Speed(RPM)		200 (盤面 Round Plate)	
重量(KG) Weight(KG)	1.4	2.5	2.5
防護等級 Protection Grade		IP40	

### 定位檢測精度 Module Dimension

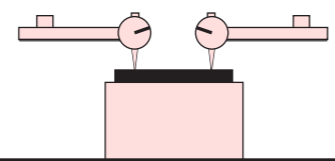
盤面同心度檢測  
Round Plate Concentricity Testing  
≤0.02mm



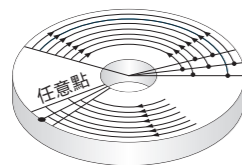
盤面旋轉振幅  
Round Plate Rotary Amplitude of Vibration  
≤0.02mm



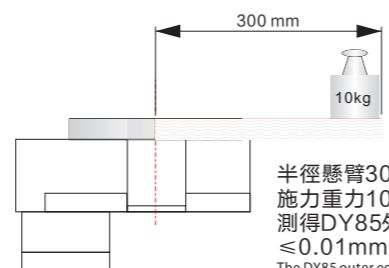
盤面與底座平行度  
Round Plate & Base Parallelism  
≤0.02mm



外徑任意點定位精度  
Positioning Accuracy of Arbitrary Point in Outer Diameter.  
半徑42.5mm  
Radius 42.5mm  
≤1min



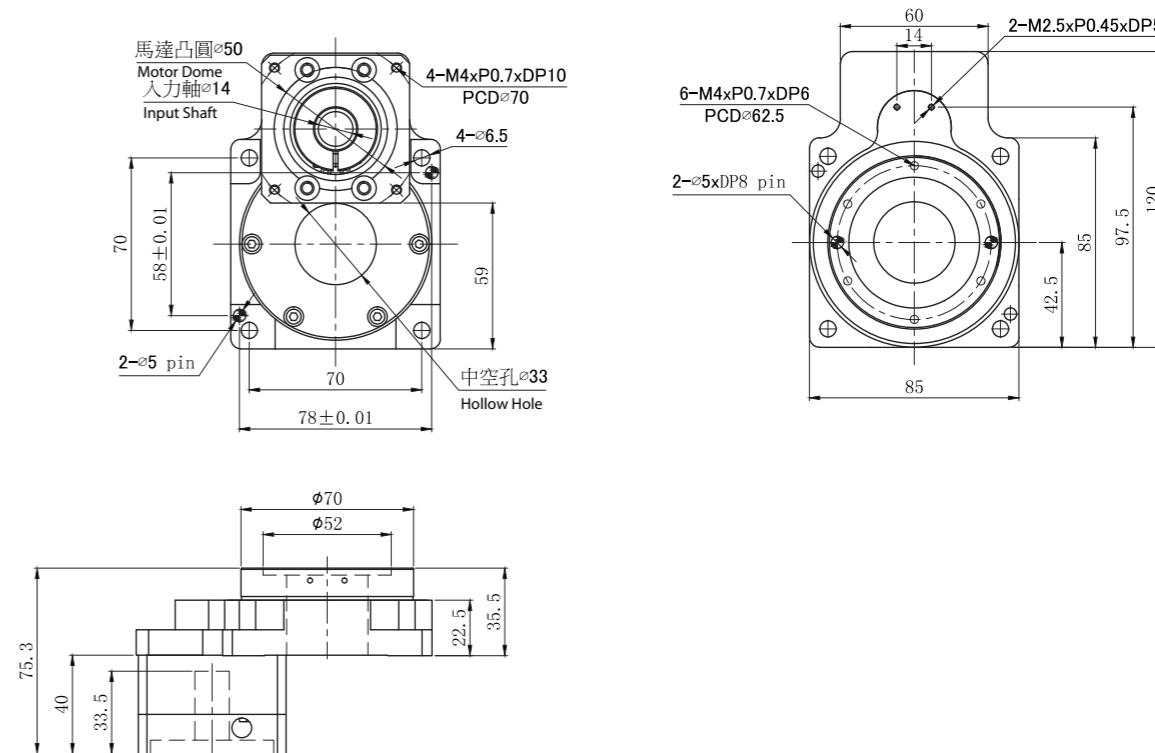
反覆定位精度  
Repetitive Accuracy Radius  
半徑42.5mm  
Radius 42.5mm  
≤10sec



半徑懸臂300mm  
施力重力10kg時,  
測得DY85外邊緣  
≤0.01mm  
The DY85 outer edge is ≤0.01mm  
when the radius cantilever is 300mm.

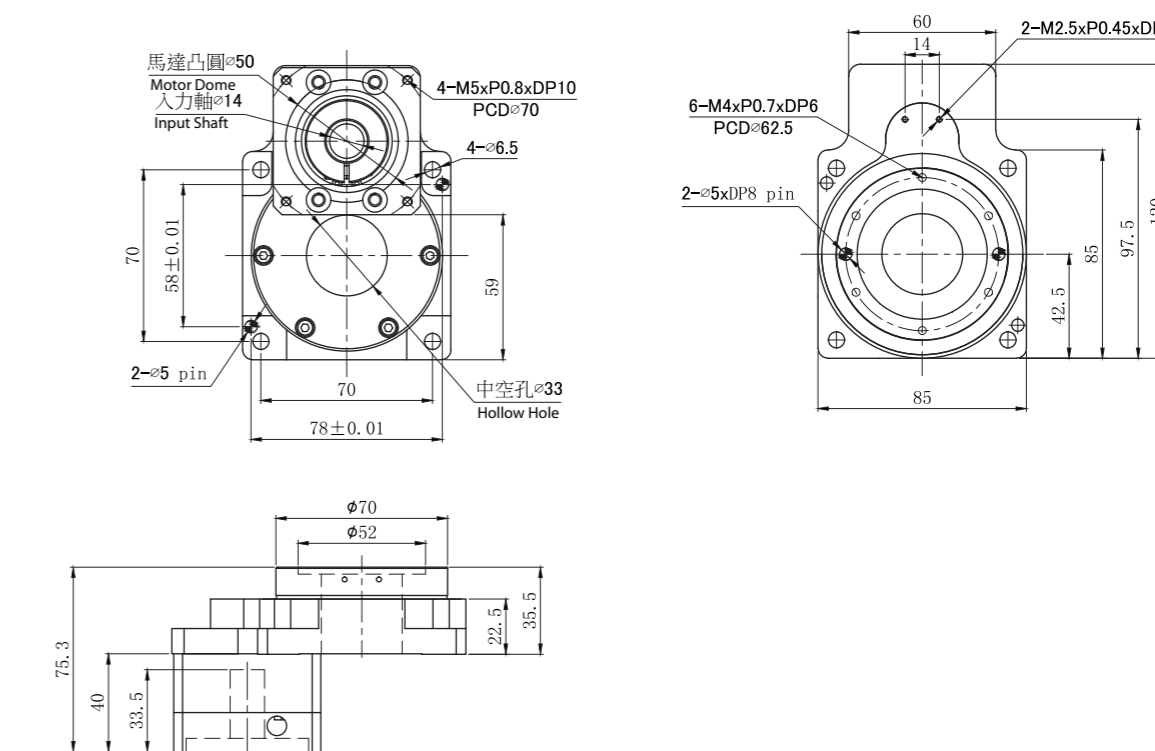
### 產品尺寸 Module Dimension

#### DY85F-5/10/18-V1



2D&3D文档下载請至  
www.limonrobot.cn

#### DY85F-5/10/18-V2

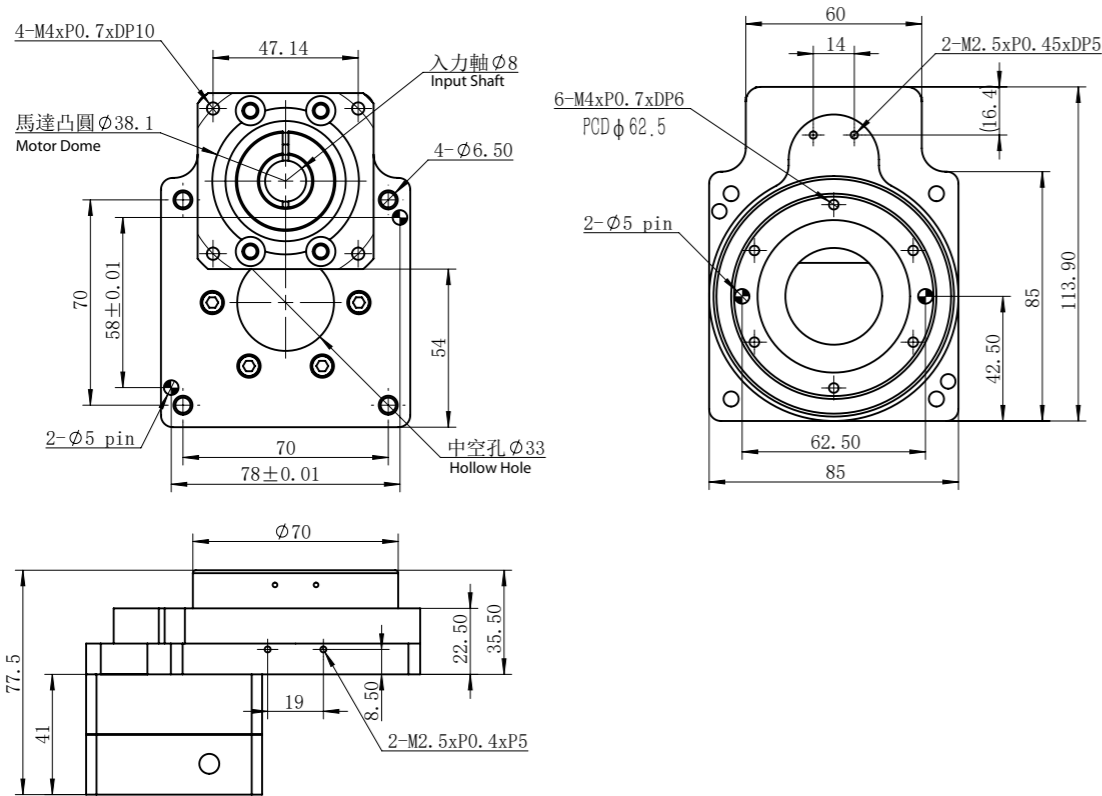


2D&3D文档下载請至  
www.limonrobot.cn

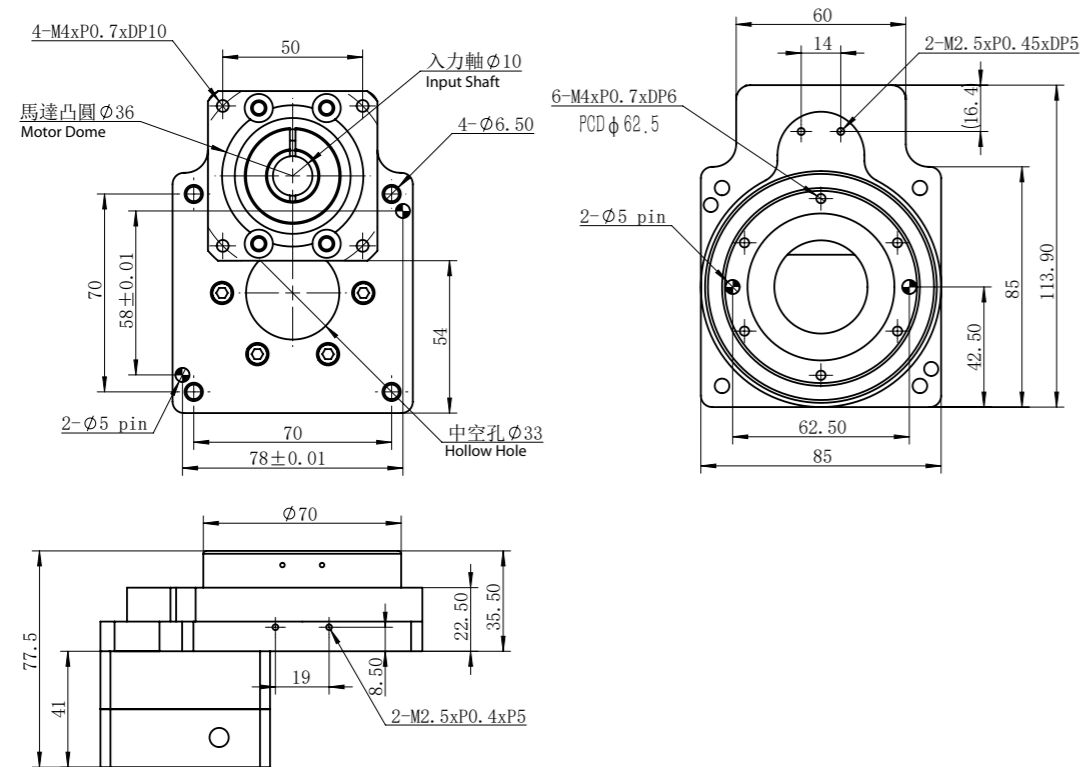


### 產品尺寸 Module Dimension

#### DY85F-5/10/18-T1

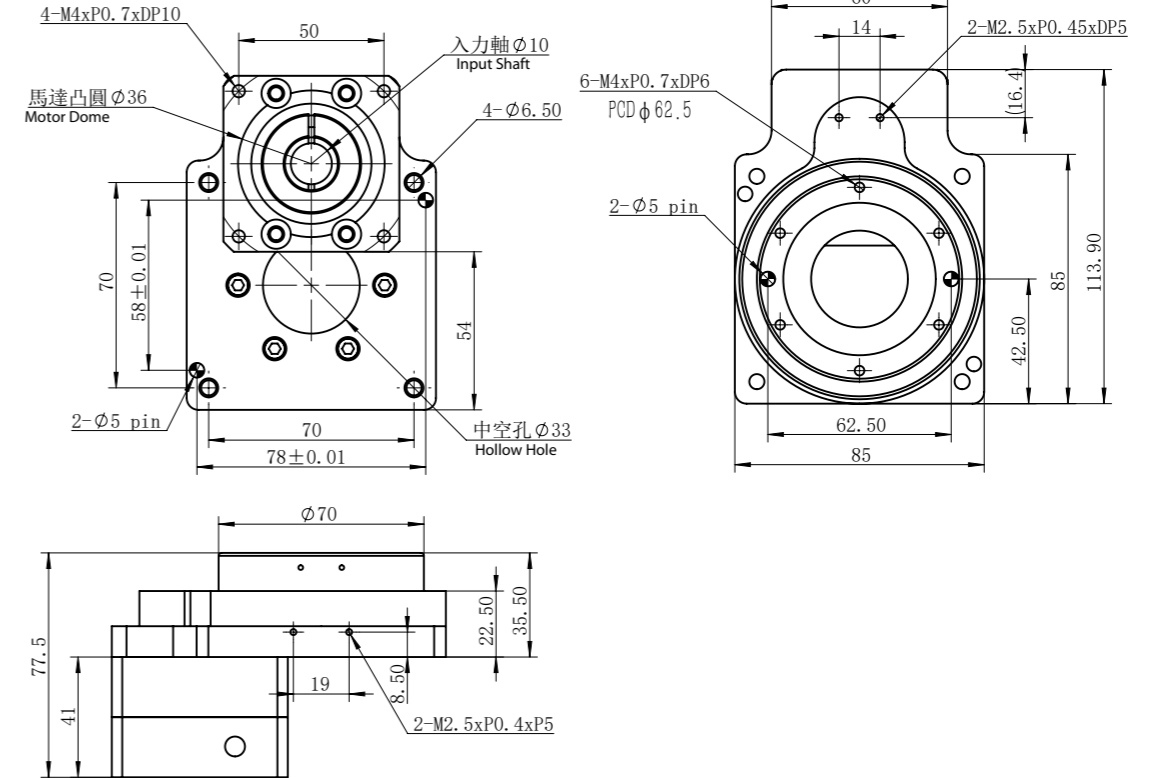
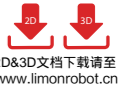


#### DY85F-5/10/18-T2

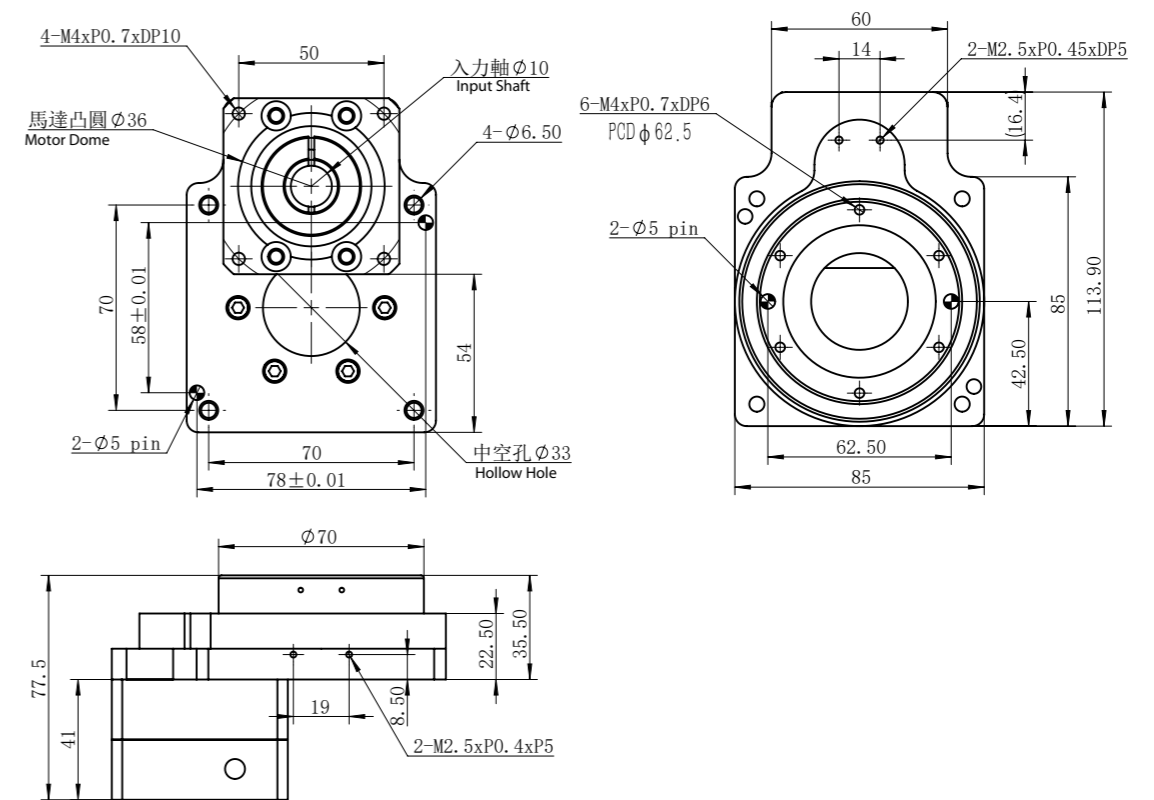


### 產品尺寸 Module Dimension

#### DY85F-5/10/18-T3

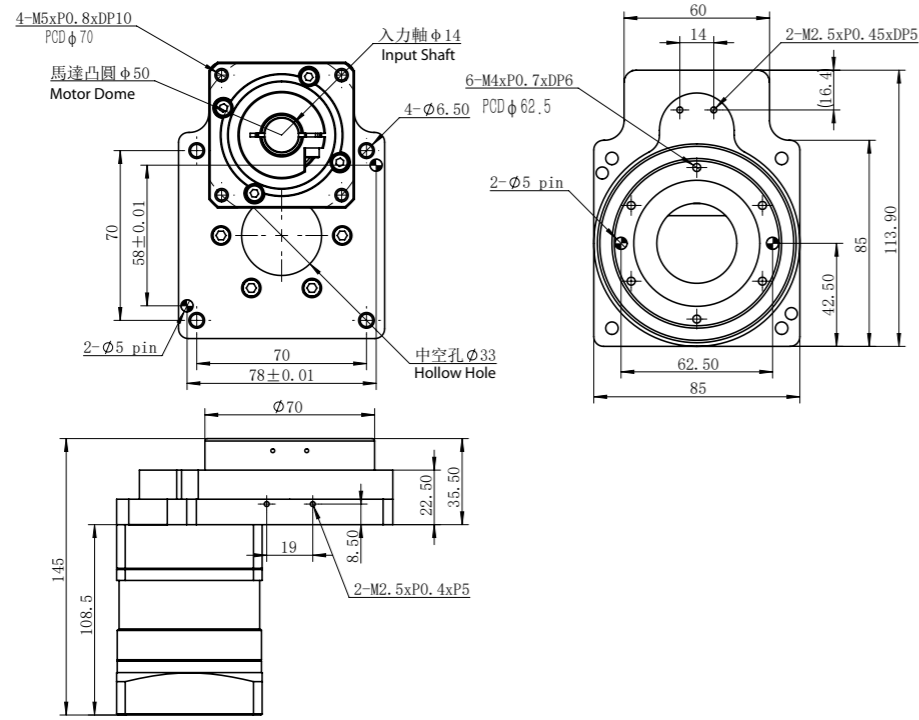


#### DY85P-20/40/72-V1

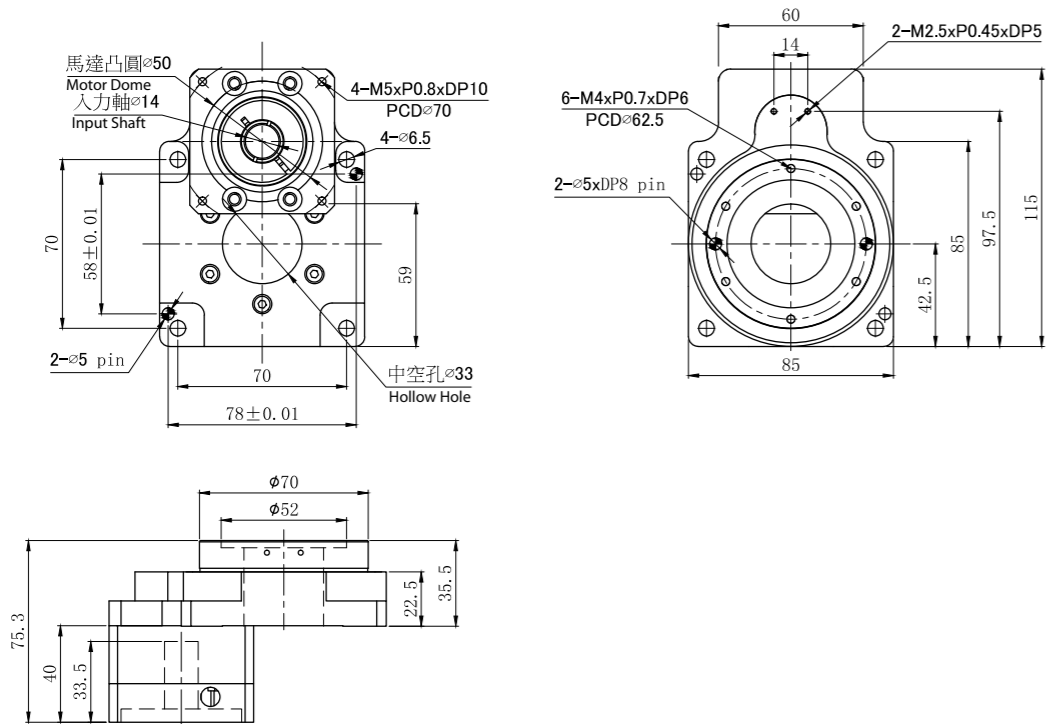


### 產品尺寸 Module Dimension

#### DY85P-20/40/72-V2

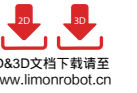
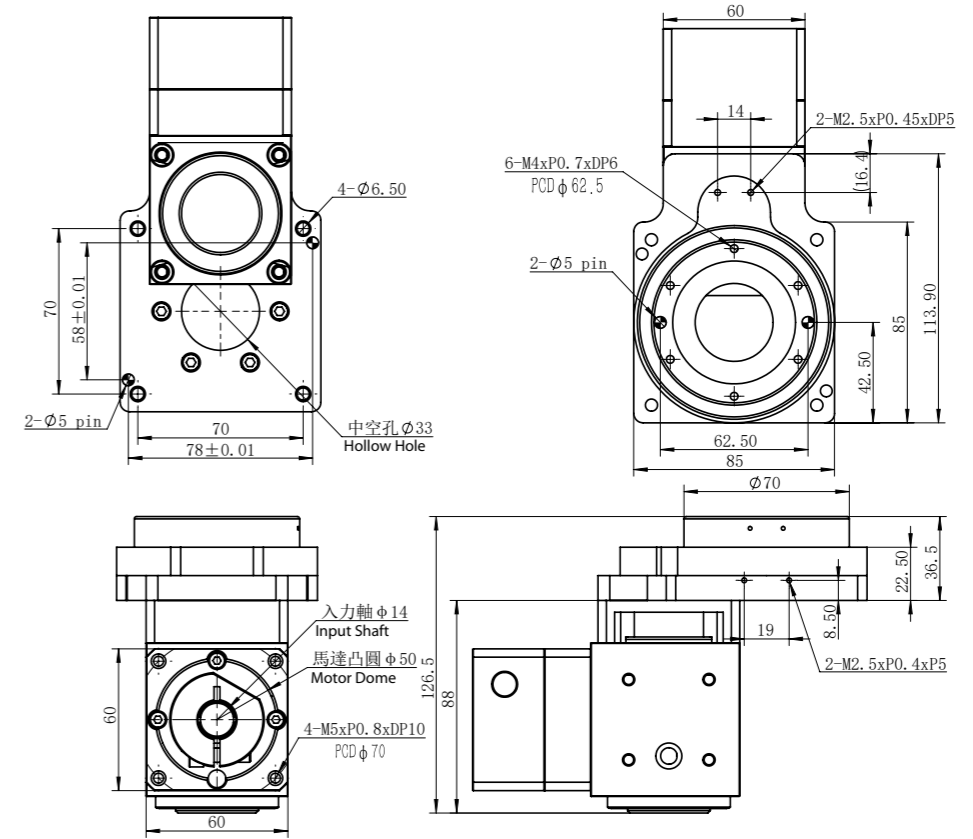


#### DY85R-15/30/54-V1



### 產品尺寸 Module Dimension

#### DY85R-15/30/54-V2



### 訂購型號代碼 Code

**DY 130 - R - 10 - V1**

產品規格  
Specification

馬達連接方式  
Motor Connecting Method

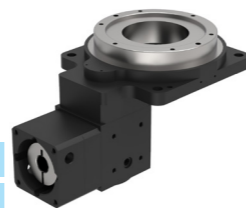
減速比  
Reduction Ratio

馬達類型  
Motor Type

F: 直結式  
F: Direct  
R: 一體式直角轉向  
R: Integrated Right Angle Turning  
P: 一體式行星減速機直連  
P: Integrated Planetary Reducer

10  
18  
30  
40  
54  
72

V1: 伺服 φ 14 PCD70,M4  
V1: Servo φ 14 PCD70,M4  
V2: 伺服 φ 14 PCD70,M5  
V2: Servo φ 14 PCD70,M5  
各廠牌200~400W AC 伺服馬達  
Factory Brand 200~400W AC Servo Motor  
T1: 步進 φ 8 PCD66.67,M4  
T1: Stepper φ 8 PCD66.67,M4  
T2: 步進 φ 8 PCD70,M4  
T2: Stepper φ 8 PCD70,M4  
T3: 步進 φ 10 PCD70,M4  
T3: Stepper φ 10 PCD70,M4  
各廠牌60型步進馬達  
All Kinds of Type 60 Stepper Motor

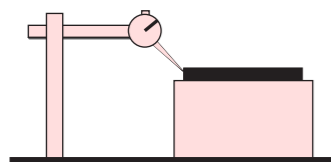


### 技術參數 Technical Parameters

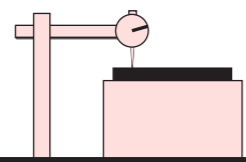
產品型號 Model Type	DY130-F	DY130-P	DY130-R
減速比 Reduction Ratio	10,18	40,72	30,54
容許轉矩 (N·m) Permissible Torque (N·m)		45	
轉動慣量(kg·m <sup>2</sup> ) Moment of Inertia (kg·m <sup>2</sup> )		150600*10 <sup>-7</sup>	
容許軸向負載 (N) Permissible Inertia Moment Load (N)		2000	
容許慣性力矩負荷 (N.M) Permissible Inertia Moment Load(N.M)		50	
重複定位精度(arc-sec) Repetitive Accuracy (arc-sec)	≤15	≤30	≤30
定位精度(arc-min) Positioning Accuracy(arc-min)		≤1	
旋轉平臺平行度(mm) Rotary Plate Parallelism(mm)		≤0.02	
旋轉平臺同心度(mm) Rotary Plate Concentricity(mm)		≤0.02	
精度壽命H Accuracy Life(H)		20000	
允許轉速(RPM) Permissible Revolution Speed(RPM)		200 (盤面 Round Plate)	
重量(KG) Weight(KG)	2.4	3.4	3.5
防護等級 Protection Grade		IP40	

### 定位檢測精度 Module Dimension

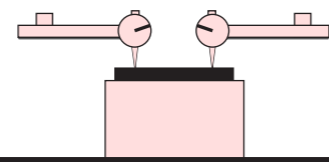
盤面同心度檢測  
Round Plate Concentricity Testing  
≤0.02mm



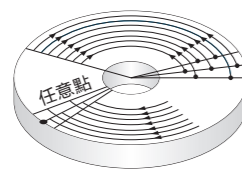
盤面旋轉振幅  
Round Plate Rotary Amplitude of Vibration  
≤0.02mm



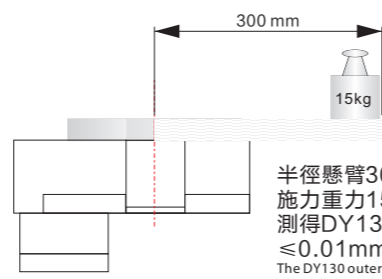
盤面與底座平行度  
Round Plate&Base Parallelism  
≤0.02mm



外徑任意點定位精度  
Positioning Accuracy of Arbitrary Point in Outer Diameter.  
半徑65mm  
Radius 65mm  
≤1min



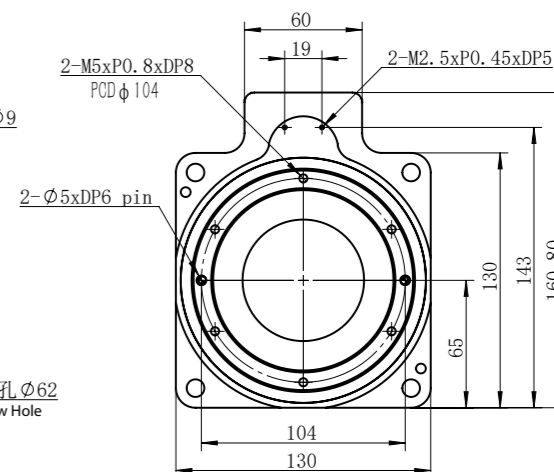
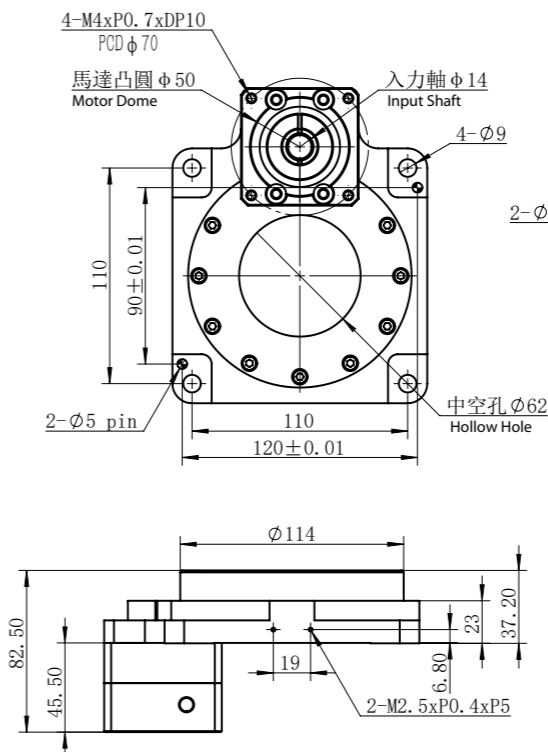
反覆定位精度  
Repetitive Accuracy Radius  
半徑65mm  
Radius 65mm  
≤10sec



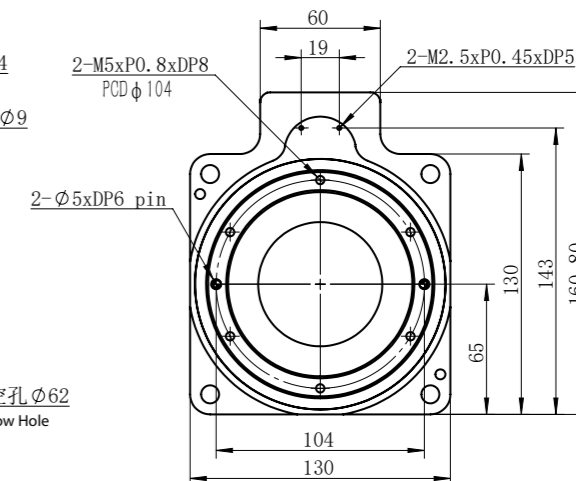
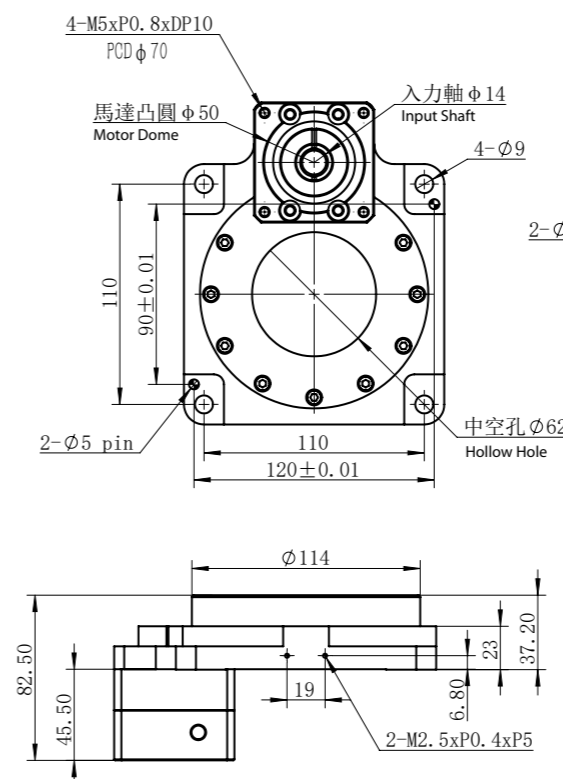
半徑懸臂300mm  
施力重力15kg時,  
測得DY130外邊緣  
≤0.01mm  
The DY130 outer edge is ≤0.01mm  
when the radius cantilever is 300mm.

### 產品尺寸 Module Dimension

DY130F-10/18-V1

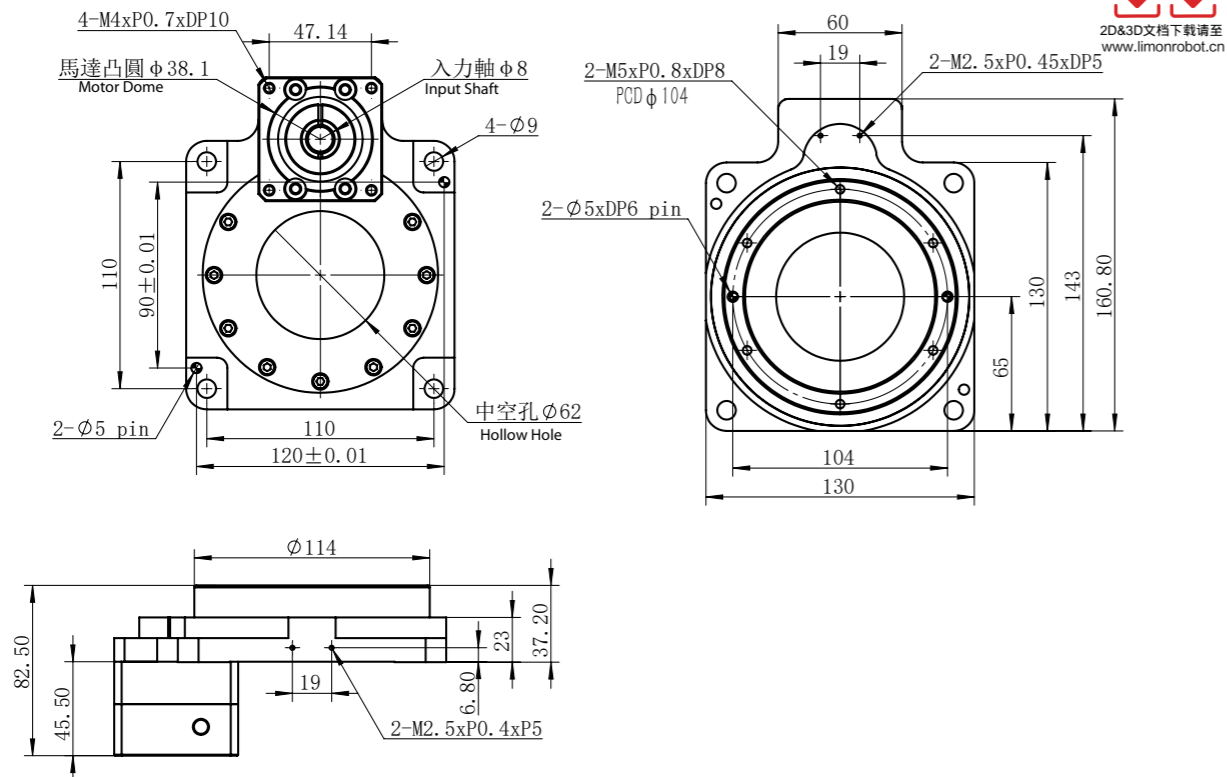


DY130F-10/18-V2

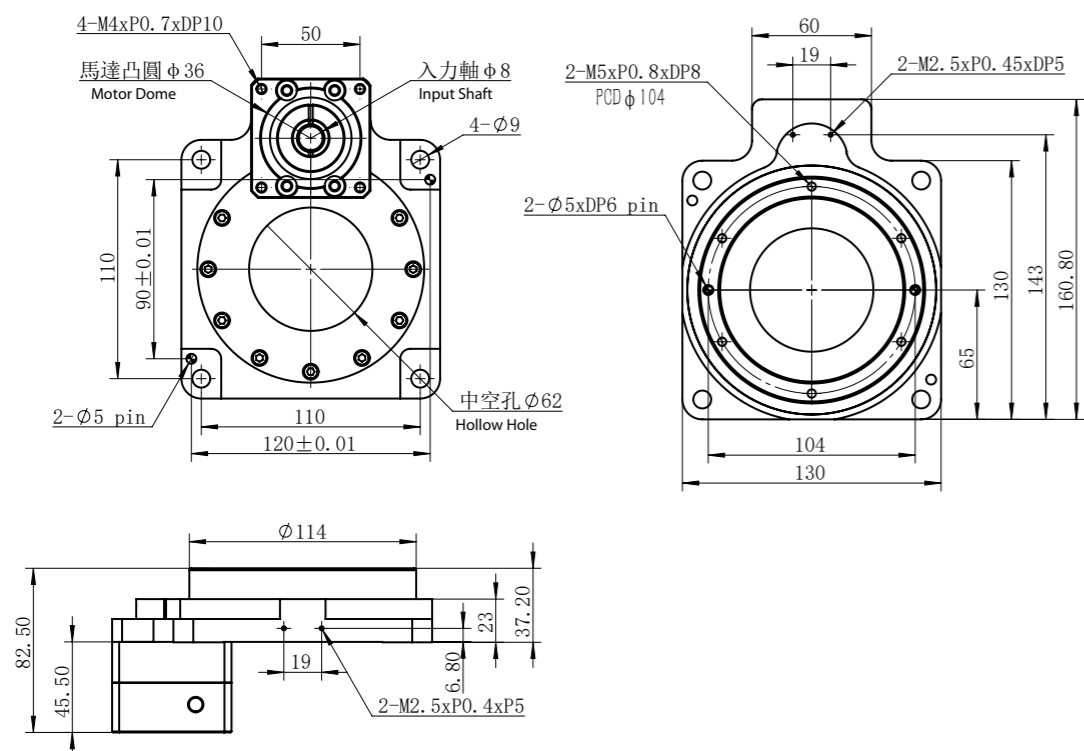


### 產品尺寸 Module Dimension

#### DY130F-10/18-T1

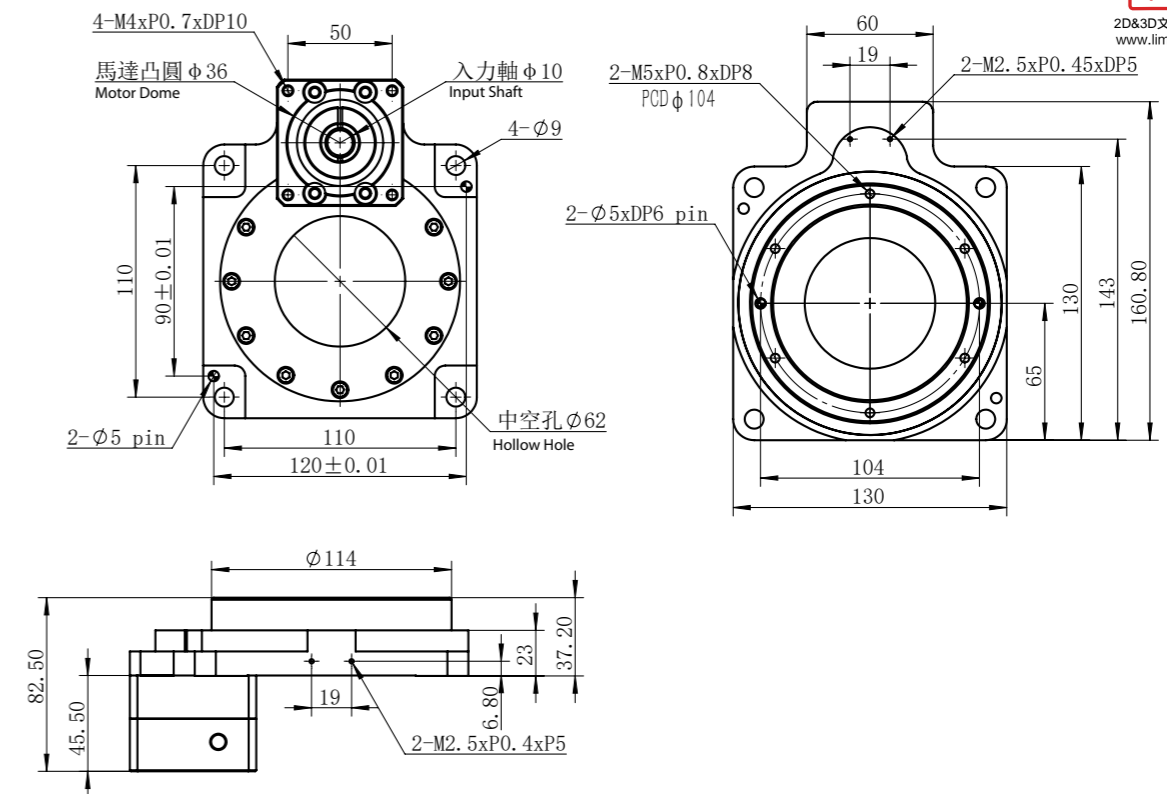


#### DY130F-10/18-T2

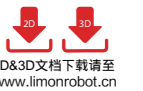
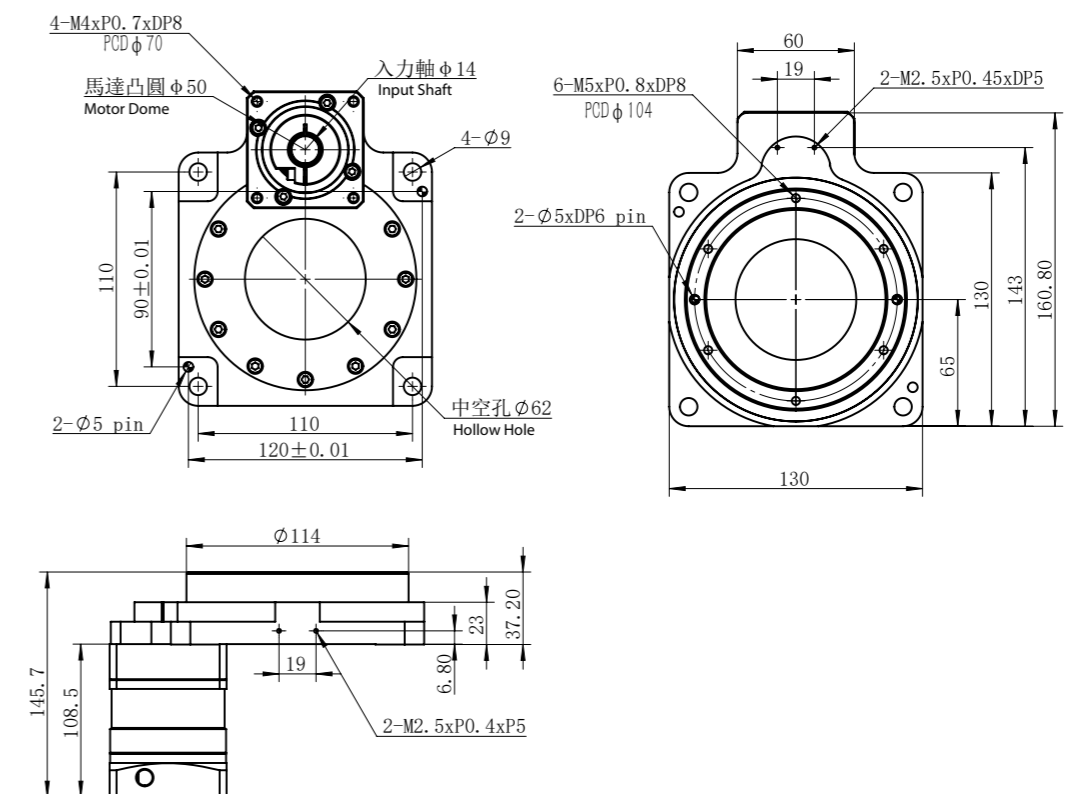


### 產品尺寸 Module Dimension

#### DY130F-10/18-T3



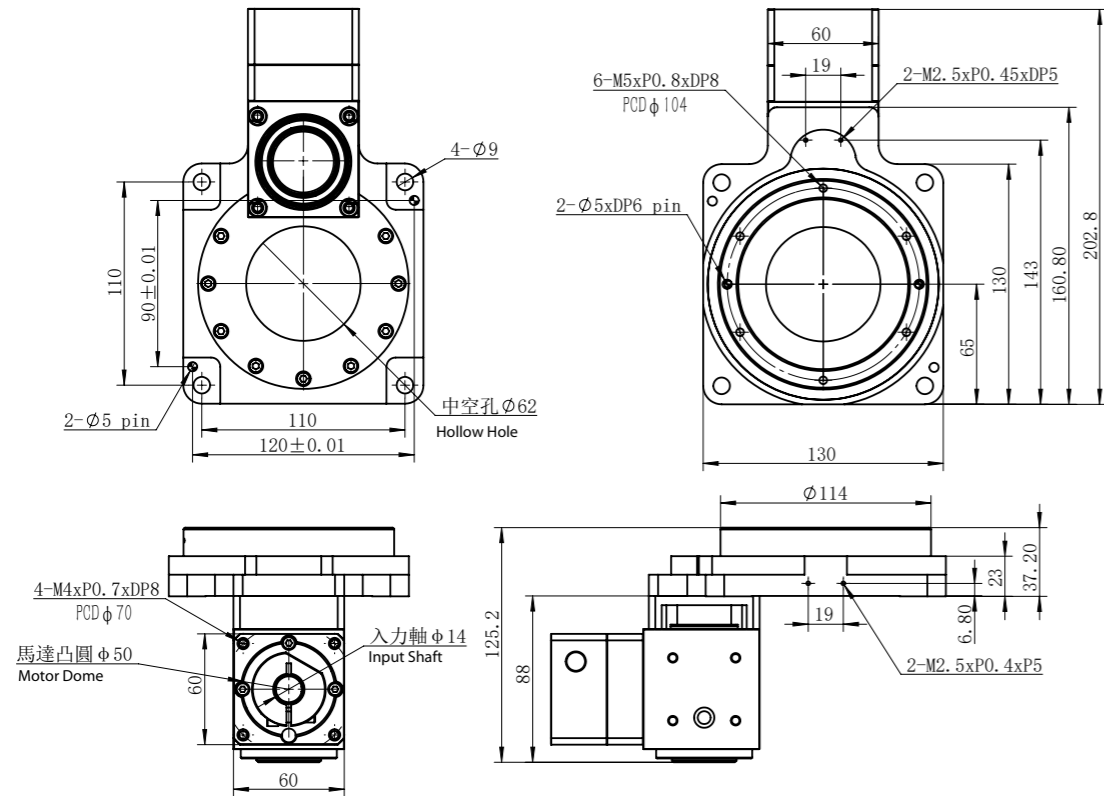
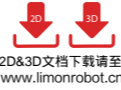
#### DY130P-40/72-V1



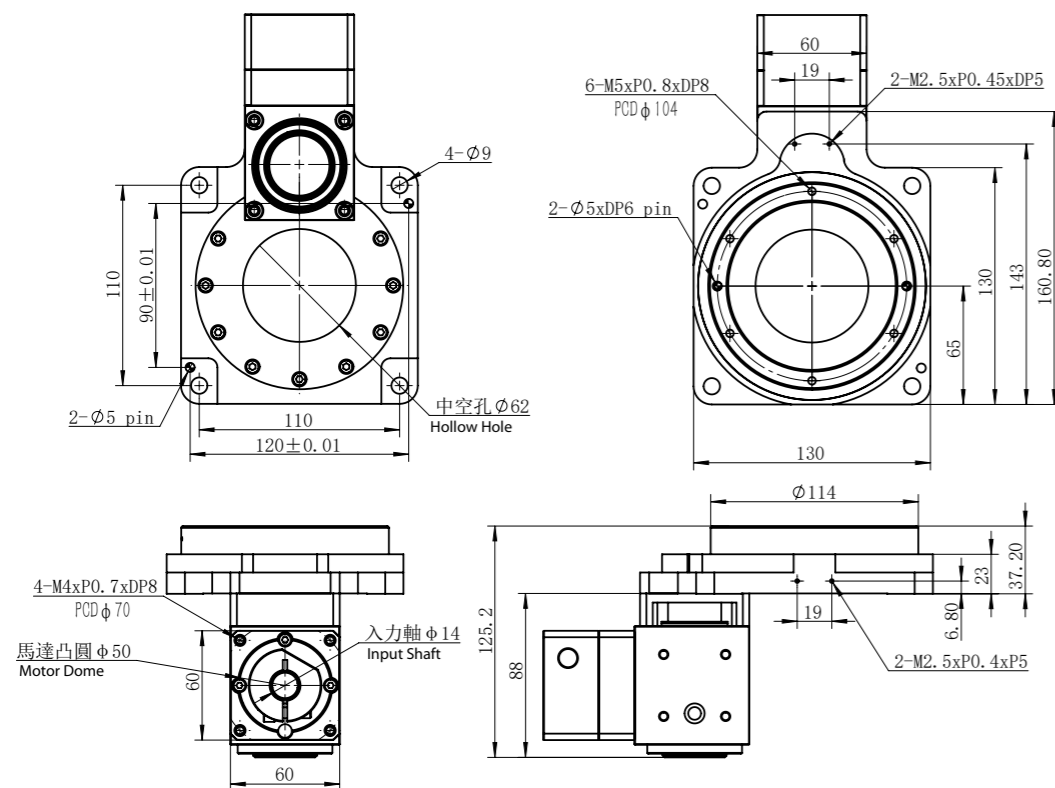


### 產品尺寸 Module Dimension

#### DY130P-40/72-V2

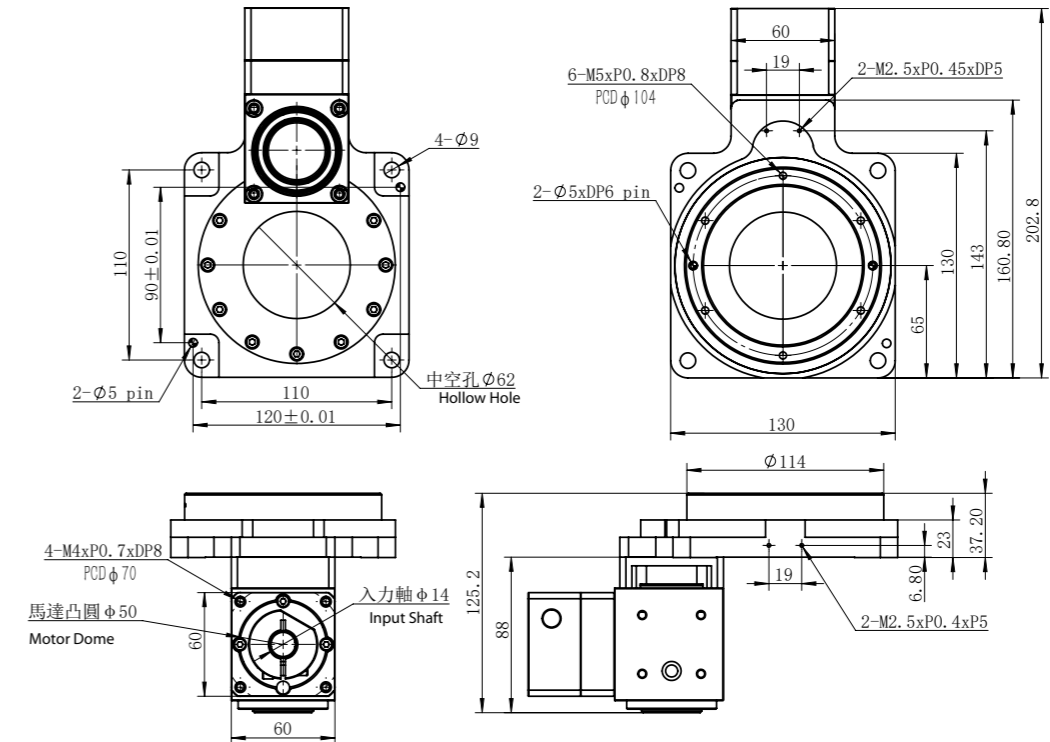
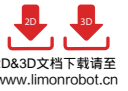


#### DY130R-30/54-V1



### 產品尺寸 Module Dimension

#### DY130R-30/54-V2



### 产品型號 Code

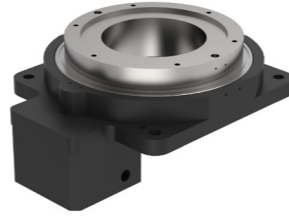
**DY 200 - R - 10 - V1**

產品規格  
Specification

馬達連接方式  
Motor Connecting Method

減速比  
Reduction Ratio

馬達類型  
Motor Type



- F: 直結式  
F: Direct
- R: 一體式直角轉向  
R: Integrated Right Angle Turning
- P: 一體式行星減速機直連  
P: Integrated Planetary Reducer

- 10
- 18
- 30
- 40
- 54
- 72

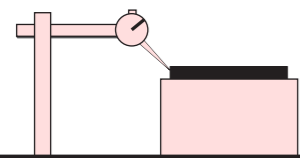
- V1: 伺服 φ19 PCD90,M5  
V1: Servo φ19 PCD90,M5
- V2: 伺服 φ19 PCD90,M6  
V2: Servo φ19 PCD90,M6
- 各廠牌750W AC 伺服馬達  
Factory Brand 750W AC Servo Motor
- T1: 步進 φ14 PCD98.4,M5  
T1: Stepper φ14 PCD98.4,M5
- T2: 步進 φ14 PCD98.4,M6  
T2: Stepper φ14 PCD98.4,M6
- 各廠牌86型步進馬達  
All Kinds of Type 86 Stepper Motor

### 产品參數 Module Parameters

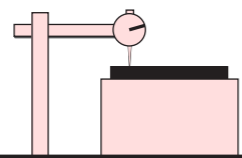
產品型號 Model Type	DY200-F	DY200-R	DY200-P
減速比 Reduction Ratio	10,18	30,54	40,72
容許轉矩 N·m Permissible Torque N·m		85	
轉動慣量 kg·m <sup>2</sup> Moment of Inertia kg·m <sup>2</sup>		916400*10 <sup>-7</sup>	
容許軸向負載 (N) Permissible Inertia Moment Load(N)		4000	
容許慣性力矩負荷 (N.M) Permissible Inertia Moment Load(N.M)		10	
重複定位精度(arc-sec) Repetitive Accuracy (arc-sec)	≤15	≤15	≤60
定位精度(arc-min) Positioning Accuracy (arc-min)		≤1	
旋轉平臺平行度(mm) Rotary Plate Parallelism (mm)		≤0.02	
旋轉平臺同心度(mm) Rotary Plate Concentricity (mm)		≤0.02	
精度壽命(H) Accuracy Life(H)		20000	
允許轉速(RPM) Permissible Revolution Speed (RPM)		150 (盤面 Round Plate)	
重量(KG) Weight(KG)	8.5	8.5	12.7
防護等級 Protection Grade		IP40	

### 定位檢測精度 Module Dimension

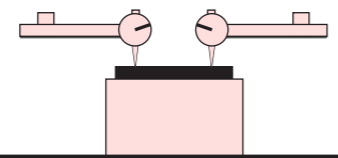
盤面同心度檢測  
Round Plate Concentricity Testing  
≤0.02mm



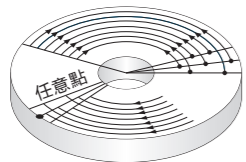
盤面旋轉振幅  
Round Plate Rotary Amplitude of Vibration  
≤0.02mm



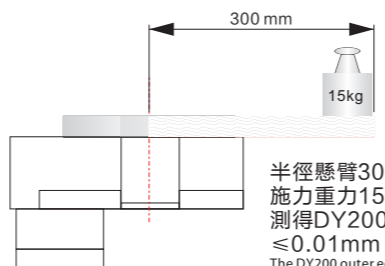
盤面與底座平行度  
Round Plate&Base Parallelism  
≤0.02mm



外徑任意點定位精度  
Positioning Accuracy of Arbitrary Point in Outer Diameter.  
半徑100mm  
Radius 100mm  
≤1min



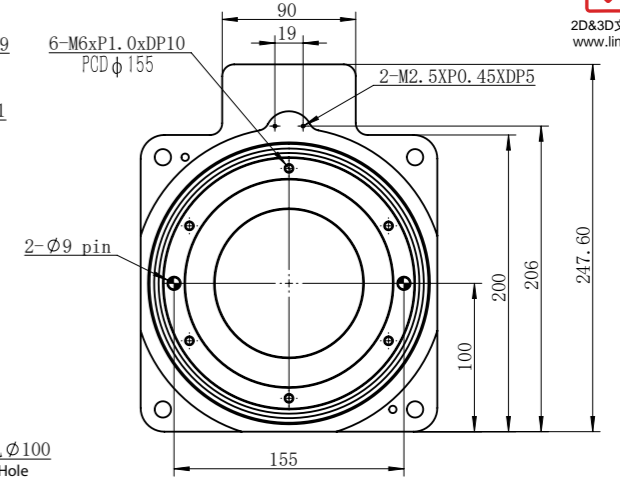
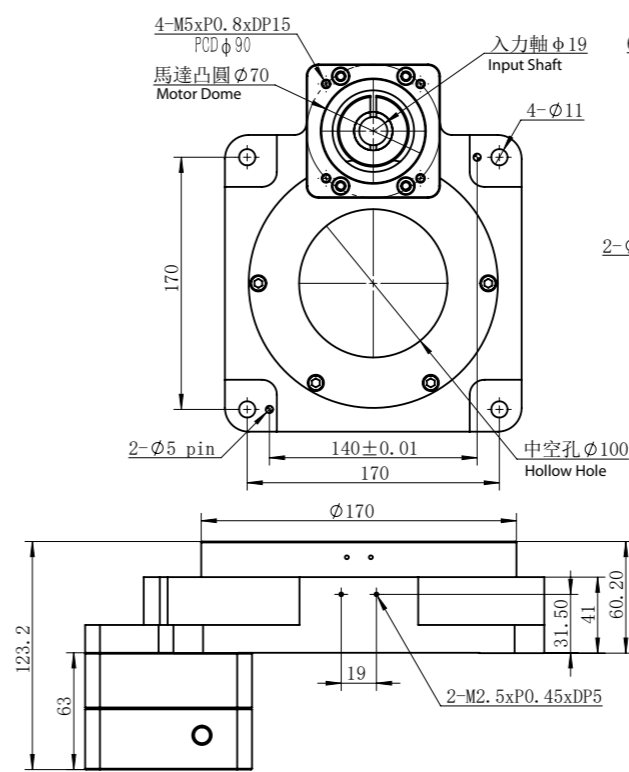
反覆定位精度  
Repetitive Accuracy Radius  
半徑100mm  
Radius 100mm  
≤10sec



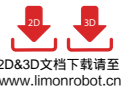
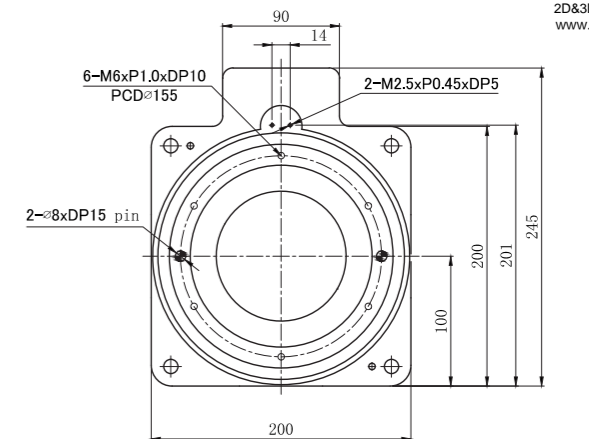
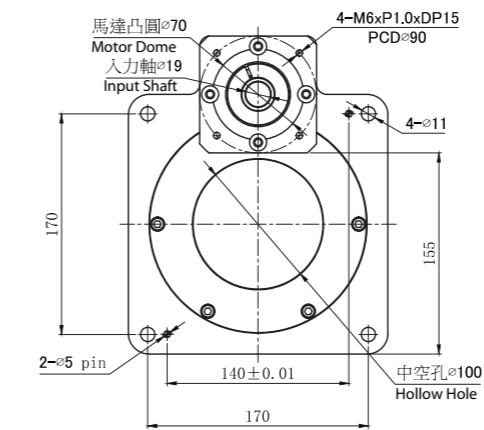
半徑懸臂300mm  
施力重力15kg時,  
測得DY200外邊緣  
≤0.01mm  
The DY200 outer edge is ≤0.01mm  
when the radius cantilever is 300mm.

### 产品尺寸 Module Dimension

DY200F-10/18-V1

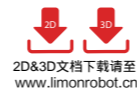
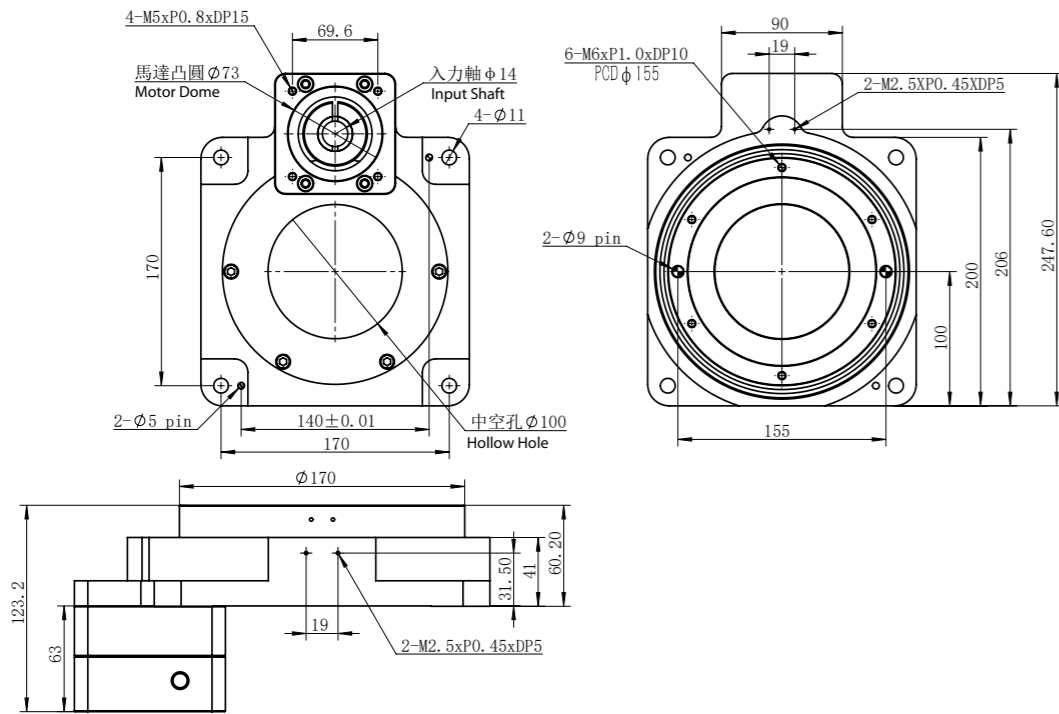


DY200F-10/18-V2

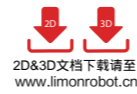
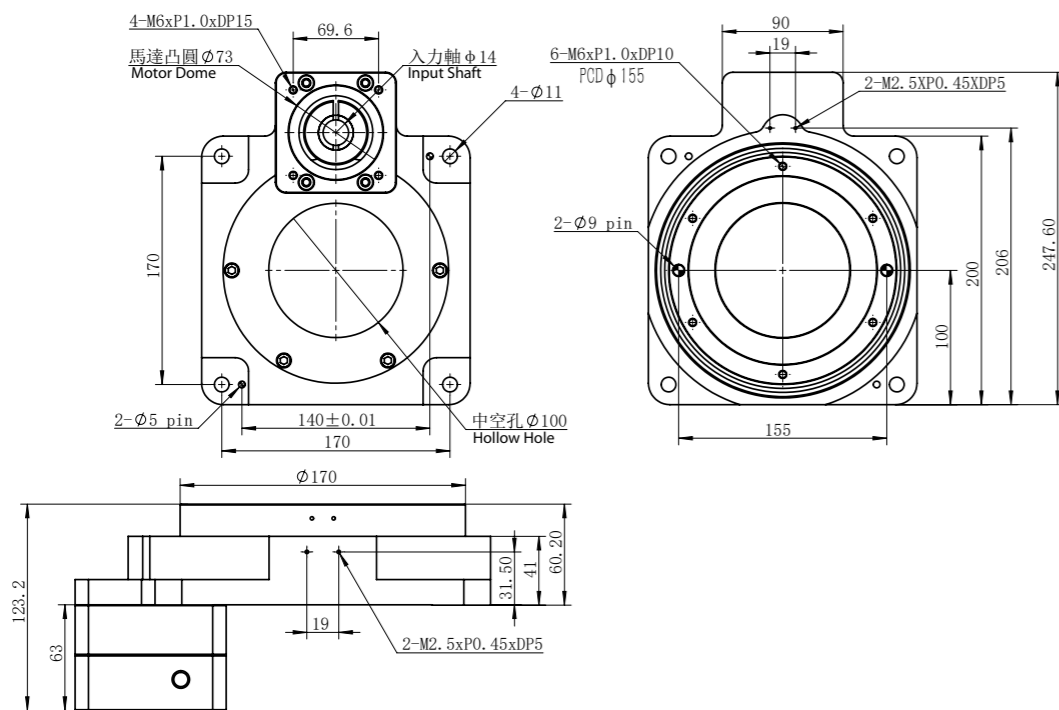


### 產品尺寸 Module Dimension

#### DY200F-10/18-T1

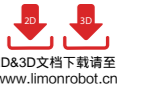
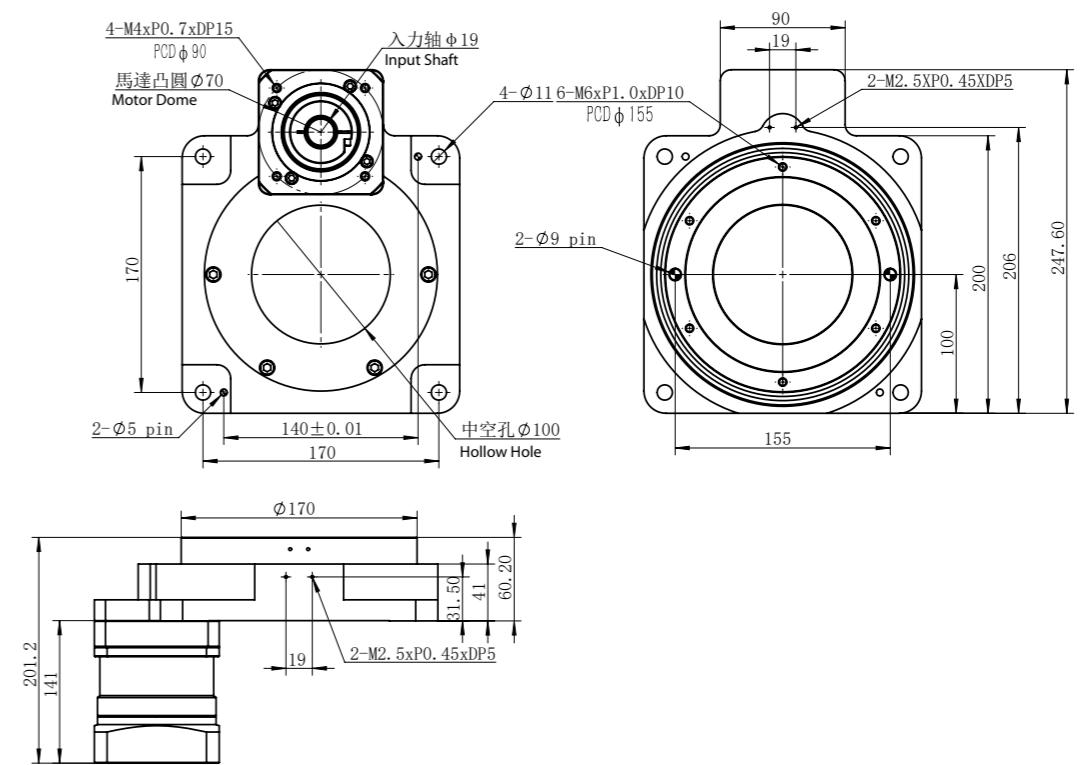


#### DY200F-10/18-T2

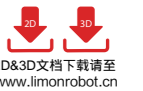
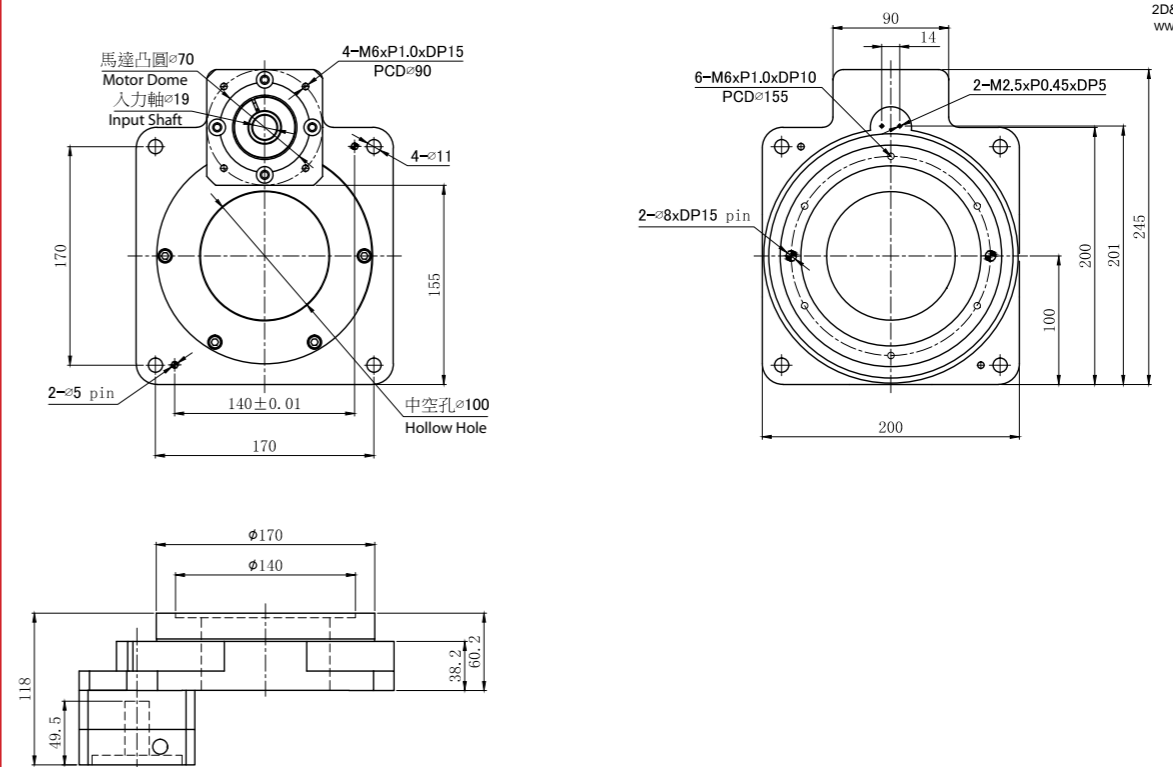


### 產品尺寸 Module Dimension

#### DY200P-40/72-V1



#### DY200P-40/72-V2

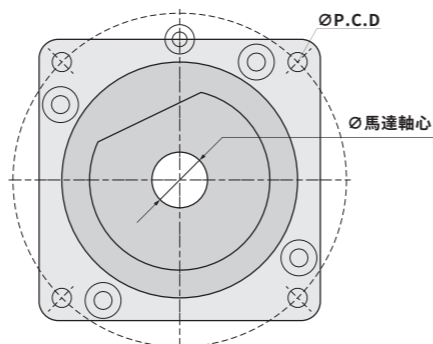
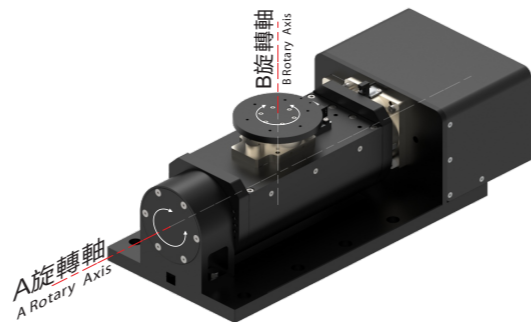






### 产品型號 Code MDC

產品型號 Model Type	MDC100□□-210	MDC100□□-310
容許轉矩 N·m Permissible Torque N·m	45	
容許荷重 kg Max Load kg	20	
旋轉角度 Angle of Rotation	A軸 / A Axis	±95°
	B軸 / B Axis	360°
旋轉精度 Precision of Rotation	A軸 / A Axis	≤30"
	B軸 / B Axis	≤30"
重複定位精度 Repetition precision	A軸 / A Axis	≤10"
	B軸 / B Axis	≤10"
最大旋轉半徑 mm Max Radius of Rotation mm	210	310
二維同心度 mm 2 Dimensional Concentricity mm	±0.02	
二維平行度 mm 2 Dimensional Parallelism mm	±0.02	
減速比 i Gear Ratio	A軸 / A Axis	1:24
	B軸 / B Axis	1:24
允許旋轉速度 Max Rotary Speed	540° / sec	
防護等級 Protection Rating	IP60	
馬達 Motor	A軸 / A Axis	60型步進馬達 or 200w伺服馬達
	B軸 / B Axis	42型步進馬達 or 100w伺服馬達
質量 kg Weight kg	15.5	15.7



馬達法蘭示意圖  
Instruction of Motor Flange

### 馬達安裝說明 Instructions of Motor Mounting

**1**

確認馬達和旋轉平臺的安裝尺寸，並清除表面所有的異物。  
Confirm the assembling size of motor and rotary plate as well as remove all the foreign materials in the surface.

**2**

拆下馬達法蘭板的防塵塞，然後調整位置，直至能夠看到緊固螺栓。  
查看(附件1)  
Dismantle the dust plug in the motor flange plate, then adjust the place until the fastening bolt can be seen. (refer to attachment 1)

**3**

將馬達與法蘭板位置調整好，輕輕旋緊緊固螺栓，直至鎖緊環不再空轉。  
Adjust the place of motor flange plate, then screw the fastening bolt gently until the binding ring no longer idle.

**4**

參照緊固扭力標準Ta，對角旋緊緊固螺栓。查看(附件2)  
According to the tightening torque standard Ta, screw the fastening bolt from corner (refer to attachment 2)

**5**

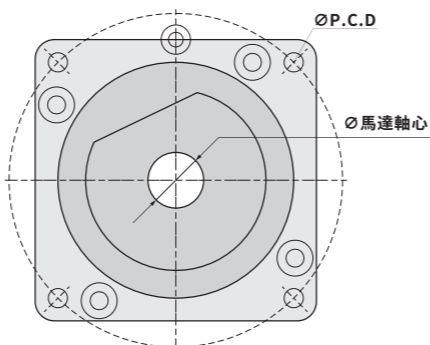
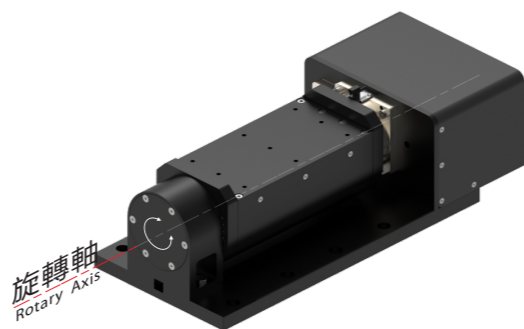
參照緊固扭力標準Tb，旋緊緊固螺栓。查看(附件2)  
According to the tightening torque standard Tb, screw the fastening bolt (refer to attachment 2)

**6**

安裝防塵塞。  
Assemble the dust plug

### 产品型號 Code MDL

產品型號 Model Type	MDL100□-210	MDL100□-310
容許轉矩 N·m Permissible Torque N·m	45	
容許荷重 kg Max Load kg	20	
旋轉角度 Angle of Rotation	±95°	
旋轉精度 Precision of Rotation	≤30"	
重複定位精度 Repetition precision	≤10"	
最大旋轉半徑 mm Max Radius of Rotation mm	210	310
旋轉同心度 mm Rotation of Concentricity mm	±0.01	
旋轉平行度 mm Rotation of Parallelism mm	±0.01	
減速比 i Gear Ratio	24	
允許旋轉速度 Max Rotary Speed	540° / sec	
防護等級 Protection Rating	IP60	
馬達 Motor	A軸 / A Axis	56/60型步進馬達 or 200-400w伺服馬達
質量 kg Weight kg	12.5	12.7



馬達法蘭示意圖  
Instruction of Motor Flange

### 附件1 Attachment 1 如何安裝馬達 How to assemble the motor

**(A)**

附有機械鍵的馬達拔出機械鍵，調整鎖緊環的位置使鎖緊環槽口與輸入軸槽口對齊，以便最大限度的緊固鎖緊環的緊固螺栓。  
Pull the motor out of mechanical key, then adjust the binding ring place to align the notch with the input shaft notch for screwing up the fastening bolt in the binding ring.

**(B)**

馬達軸徑與輸入軸孔徑不能匹配時，加入軸套，其安裝方法與圖A的安裝方法一樣，注意軸套槽口、輸入軸槽口、鎖緊環槽口要對齊。  
If the motor shaft diameter can not match with the input shaft diameter, then add the axle sleeve (the assembling method is same with pic A). Please note that the notch of axle sleeve, input shaft and binding ring are all in line.

### 附件2 Attachment 2 扳手螺栓緊固轉矩 Fastening the torque by using the wrench bolt.

扳手螺栓尺寸 Wrench Bolt Size	馬達安裝 Motor Mounting Ta-8.8T		鎖緊環安裝 Binding Ring Assembling Tb	
	N·m	kgf·cm	N·m	kgf·cm
M3	1.28	13	2.15	22
M4	2.9	30	4.95	50
M5	5.75	59	9.7	99
M6	9.9	101	16.5	168
M8	24	245	40	408
M10	48	489	81	826
M12	83	846	140	1428
M14	132	1346	220	2243
M16	200	2039	340	3467

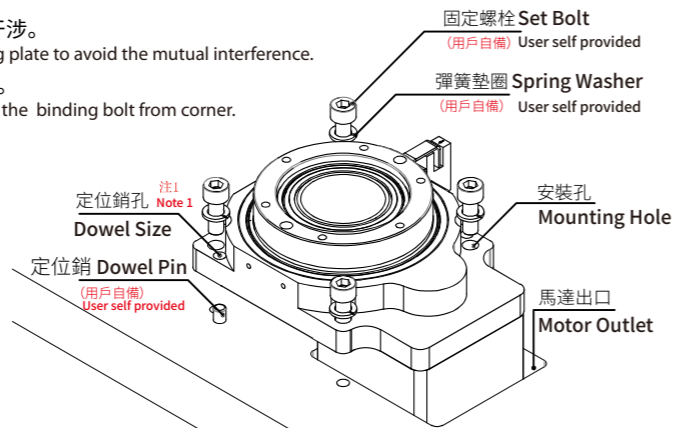
### 中空旋轉平臺安裝說明 Hollow Rotary Table Assembling Instructions

在中空旋轉平臺安裝板上預留馬達出口，以免馬達與安裝板干涉。  
Reserve the place of motor outlet in the hollow rotary table assembling plate to avoid the mutual interference.

安裝2個定位銷孔將中空旋轉平臺定位，再對角旋緊固定螺柱。  
Assemble two dowel holes to fix the hollow rotary table, then screw up the binding bolt from corner.

#### 注1 Note 1 定位銷孔尺寸 Dowel Size

平臺規格 Table Specification	銷孔直徑 Pin Hole Diameter mm	銷孔深度 Pin Hole Depth mm	銷孔數量 Pin Hole Quantity
DY60	$\phi 5^{+0.012}_{0}$ (H7)	10(貫穿 through)	2
DY85	$\phi 5^{+0.012}_{0}$ (H7)	10.5(貫穿 through)	2
DY130	$\phi 5^{+0.012}_{0}$ (H7)	11.5(貫穿 through)	2
DY200	$\phi 5^{+0.012}_{0}$ (H7)	15.2(貫穿 through)	2



#### 中空旋轉平臺上安裝負載

Assembling load in the hollow rotary table.

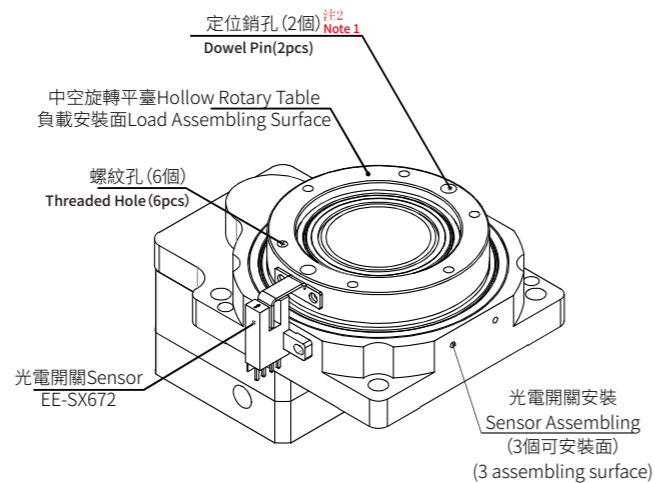
中空旋轉平臺2個負載的定位銷孔，用於確認負載的位置。將負載安裝在中空旋轉平臺安裝面，使用上面的6個螺紋孔完成對負載的緊定。

中空旋轉平臺安裝板  
Rotary Table Assembling Plate

Assemble two loading dowel pins in the hollow rotary table to confirm the loading position. Assemble the load in the hollow rotary table assembling plate, use the six taper holes above to finish load screwing.

#### 注1 Note 1 定位銷孔尺寸 Dowel Size

平臺規格 Table Specification	銷孔直徑 Pin Hole Diameter mm	銷孔深度 Pin Hole Depth mm	銷孔數量 Pin Hole Quantity
DY60	$\phi 5^{+0.012}_{0}$ (H7)	6	2
DY85	$\phi 5^{+0.012}_{0}$ (H7)	6	2
DY130	$\phi 5^{+0.012}_{0}$ (H7)	6	2
DY200	$\phi 8^{+0.015}_{0}$ (H7)	15	2



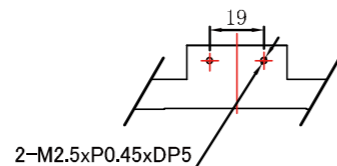
#### 定位銷孔尺寸

安裝之前，應通讀如下安裝注意事項，並按照如下條件安裝：

- 1.室內(不直接接觸陽光的區域)
- 2.沒有熱輻射的區域
- 3.工作環境(溫度:0~+50°C/濕度:低於85%)
- 4.原點感測器下方溫度:0~+40°C
- 5.不存在易燃易爆的酸性氣體
- 6.可阻擋灰塵、油和濺水的地方
- 7.不遭受直接震動和過度撞擊的地方

Before assembling, please read below attention matters and assemble according to the conditions:

- 1.Indoor (not exposed to the sunshine).
- 2.Without the heat radiation.
- 3.Working environment(temperature:0~+50°C/humidity: lower than 85%)
- 4.The temperature below home sensor:0~+40°C
- 5.Without inflammable and explosive acid gas
- 6.Place where cut off the dust, oil and splash.
- 7.Without direct vibration



光電開關安裝孔尺寸圖  
Sensor Assembling Hole Dimension Figure.

### 慣量計算範例 Inertia Calculation Example

如圖(1)所示。

假設a=400mm, b=600mm, 質量m為40kg

今令其每秒轉90°

①先求轉動慣量:

$$I = 1/12 m(a^2 + b^2) = 1/12 * 40 * (0.4^2 + 0.6^2) = 1.73 \text{ kg} \cdot \text{m}^2$$

②求轉動加速力矩:

$$M = I * \alpha \text{ 其中 } \alpha = \omega / T$$

$$\omega = 2\pi N \text{ (每秒轉動 } 360^\circ = 2\pi, 180^\circ = \pi, 90^\circ = 1/2\pi \text{)}$$

(revolve 360° per second = 2π, 180° = π, 90° = 1/2π)

因要求每秒90°，角加速度設定其0.5秒

得  $\alpha = 1/2\pi / 0.5 = 3.14$

$$\text{故 } M = 1.73 * 3.14 = 5.4 \text{ N} \cdot \text{m}$$

As picture(1)

Assume a=400mm, b=600mm, mass=40kg,

And make it revolve 90° per second.

① Calculate the rotary inertia:

$$I = 1/12 m(a^2 + b^2) = 1/12 * 40 * (0.4^2 + 0.6^2) = 1.73 \text{ kg} \cdot \text{m}^2$$

② Calculate the rotary accelerating moment:

$$M = I * \alpha \text{ which } \alpha = \omega / T$$

$$\omega = 2\pi N \text{ (revolve } 360^\circ \text{ per second} = 2\pi, 180^\circ = \pi, 90^\circ = 1/2\pi \text{)}$$

As it requires 90° per second, assuming the angular acceleration is 0.5 second.

$$\text{So } \alpha = 1/2\pi / 0.5 = 3.14 \text{ And } M = 1.73 * 3.14 = 5.4 \text{ N} \cdot \text{m}$$

如圖(2)所示。

假設圓盤半徑r=300mm, 質量m為40kg

今令其每秒轉180°

①先求轉動慣量:

$$I = mr^2/2 = 40 * 0.3^2 / 2 = 1.8 \text{ kg} \cdot \text{m}^2$$

②求轉動加速力矩:

$$M = I * \alpha \text{ 其中 } \alpha = \omega / T$$

$$\omega = 2\pi N \text{ (每秒轉動 } 360^\circ = 2\pi, 180^\circ = \pi \text{)}$$

因要求每秒180°，角加速度設定其0.5秒

得  $\alpha = \pi / 0.5 = 3.14 / 0.5 = 6.28$

$$\text{故 } M = 1.8 * 6.28 = 11.3 \text{ N} \cdot \text{m}$$

As picture(2)

Assume Radius of the circular disk r=300mm, weight m=40kg,

And make it revolve 180° per second.

① Calculate the rotary inertia:

$$I = mr^2/2 = 40 * 0.3^2 / 2 = 1.8 \text{ kg} \cdot \text{m}^2$$

② Calculate the rotary accelerating moment:

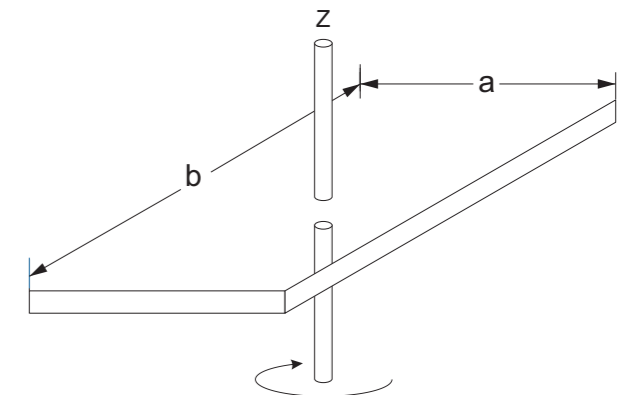
$$M = I * \alpha \text{ which } \alpha = \omega / T$$

$$\omega = 2\pi N \text{ (revolve } 360^\circ \text{ per second} = 2\pi, 180^\circ = \pi, 90^\circ = 1/2\pi \text{)}$$

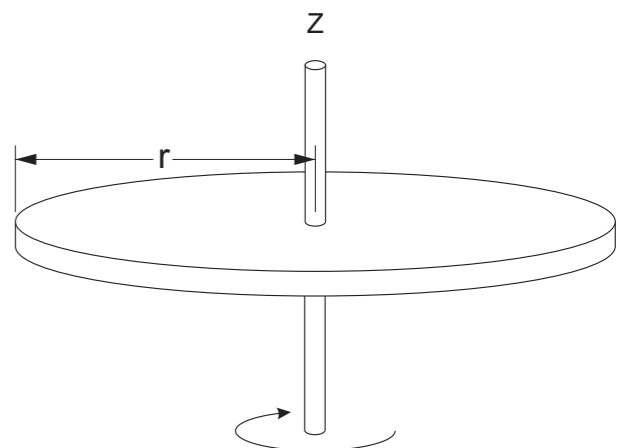
As it requires 180° per second, assuming the angular acceleration is 0.5 second.

得  $\alpha = \pi / 0.5 = 3.14 / 0.5 = 6.28$

$$\text{So } \alpha = \pi / 0.5 = 3.14 / 0.5 = 6.28 \text{ And } M = 1.8 * 6.28 = 11.3 \text{ N} \cdot \text{m}$$



圖(1) Picture(1)



圖(2) Picture(2)

# 中空旋轉平臺

## Hollow Rotary Actuators

→ Note

如圖(3)所示。

假設圓柱半徑 $r=100\text{mm}$ ,

$Z_0$ 到 $Z_1$ 的 $d=300\text{mm}$ ,  $a=1000\text{mm}$ ,  $b=600\text{mm}$ ,

方形盤質量 $m$ 為 $50\text{kg}$ , 圓柱體質量為 $10\text{kg}$

今令其每秒轉 $90^\circ$

①先求轉動慣量:

$$I_1 = 1/12 m(a^2 + b^2) = 5.67 \text{kg} \cdot \text{m}^2$$

$$I_2 = mr^2/2 + md^2 = 1.4 \text{kg} \cdot \text{m}^2$$

$$I = I_1 + I_2 = 5.67 - 1.4 = 7.07 \text{kg} \cdot \text{m}^2$$

②求轉動加速力矩:

$$M = I \cdot \alpha \quad \text{其中 } \alpha = \omega / T$$

$$\omega = 2\pi N \quad (\text{每秒轉動 } 360^\circ = 2\pi, 180^\circ = \pi, 90^\circ = 1/2\pi)$$

因要求每秒 $90^\circ$ , 角加速度設定其 $0.5$ 秒

$$\text{得 } \alpha = 1/2\pi / 0.5 = 3.14$$

$$\text{故 } M = 7.07 \cdot 3.14 = 22.2 \text{ N} \cdot \text{m}$$

As picture(3)

Assume Radius of Cylinder  $r=100\text{mm}$ ,  $b=600\text{mm}$

Square disk mass is  $50\text{kg}$ , Cylinder mass is  $10\text{kg}$ ,

And make it revolve  $90^\circ$  per second.

① Calculate the rotary inertia:

$$I_1 = 1/12 m(a^2 + b^2) = 5.67 \text{kg} \cdot \text{m}^2$$

$$I_2 = mr^2/2 + md^2 = 1.4 \text{kg} \cdot \text{m}^2$$

$$I = I_1 + I_2 = 5.67 - 1.4 = 7.07 \text{kg} \cdot \text{m}^2$$

② Calculate the rotary accelerating moment:

$$M = I \cdot \alpha \quad \text{which } \alpha = \omega / T$$

$$\omega = 2\pi N \quad (\text{revolve } 360^\circ \text{ per second} = 2\pi, 180^\circ = \pi, 90^\circ = 1/2\pi)$$

As it requires  $90^\circ$  per second, assuming the angular acceleration is  $0.5$  second.

$$\text{So } \alpha = 1/2\pi / 0.5 = 3.14 \quad \text{And } M = 7.07 \cdot 3.14 = 22.2 \text{ N} \cdot \text{m}$$

### 用語注釋說明:

\*1容許轉矩: 減速機構部的機械強度界限值。包括加速轉矩、負載慣量, 皆須在此容許轉矩範圍內使用。

\*2允許轉速: 減速機構部的機械強度可允許的旋轉平台之盤面轉速。

\*3定位精度: 選裝平台盤面於 $360^\circ$ 以內所累計的定位角度誤差總和。

\*4重複精度: 旋轉平台在任一點做正轉方向定位, 再由逆轉方向定位的相對角度誤差。

\*5旋轉平台平行度: 旋轉平台盤面運轉時相對於底座安裝面的平行度。

\*6旋轉平台同心度: 指無負載時旋轉平台內徑與外徑的同心度誤差值。

### Note:

1. Permissible torque: mechanical strength threshold value in the reducing gear part, including the accelerating torque, load inertia, all should be within the permissible torque.

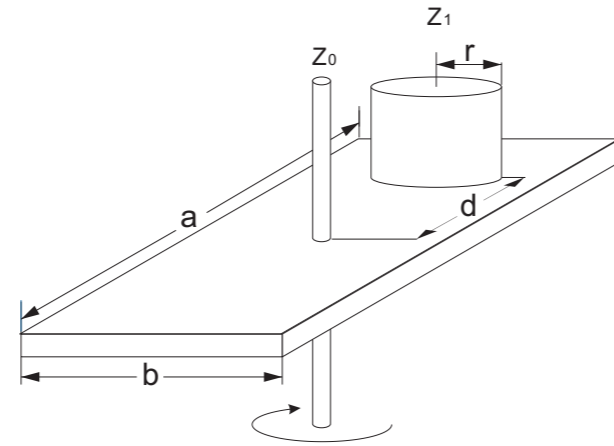
2. Permissible rotating speed: round plate rotating speed in the rotary table which is within the mechanical strength's permission in reducing gear part.

3. Positioning accuracy: accumulated positioning angle error summation within  $360^\circ$  in the rotary table.

4. Repetitive accuracy: the relative angle error regarding forward positioning in any point of rotary table compared with reverse positioning.

5. Parallelism of rotary table: Parallelism when the rotary table in round plate revolving relative to bottom base assembling surface.

6. Concentricity of rotary table: Concentricity error value of the rotary table's outer diameter and internal diameter when without any load.



圖(3) Picture (3)

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