

# TROY

TROY ENTERPRISE COMPANY LTD.

*Striving For  
Superior Precision*



泰映微信搜一搜  
TROY WeChat



## Planetary Gearbox

低背隙行星式 **減速機** 型錄

Ver.  
**2.1**

# About

## 品質・技術・服務一體的泰映

Quality, Technology, Service all-in-one

『泰映科技股份有限公司』，為精密馬達、馬達控制器及精密減速機，設計、製造一體的馬達專業製造商。  
TROY Enterprise Co., Ltd. specializes in the designing and manufacturing of Motors, Motor drivers, Controllers, and Gearboxes series.

為了建立『以客戶為中心、滿足客戶需求』的銷售、服務、信用體系，落實『提供好的產品與服務給客戶，協助客戶提升競爭力』的企業政策與承諾：

- 1996年公司成立即積極導入ISO9001、ISO14001之國際品質與環境保證體系，於1999年首次通過德國TÜV認證，且每年持續進行系統稽核至今。
- 產品安全規格認證方面：於2001年起陸續通過SGS-CE、TÜV-CE、CQC-CCC、cTÜVus、RoHS.....等產品安全相關認證及持續每年度稽核查驗。
- 企業財務信用認證方面：於2011年起每年接受Dun & Bradstreet, Inc.的D&B Credit 財務風險管理認證。

In order to establish a sales, service and credit system that is "Customer-centric and meet customer needs"; Implement corporate policies and commitments to provide customers with "Providing good products and services to customers and assisting customers to enhance their competitiveness".

- When TROY was founded in 1996, it actively introduced international quality and environmental assurance systems, ISO9001 and ISO14001. We passed the German TÜV certification in 1999 and continues to conduct systematic audits every year.
- Product safety specification certification: Since 2001, we have passed SGS-CE, TÜV-CE, CQC-CCC, cTÜVus, RoHS... and other product safety-related certifications and continuous annual inspections.
- Corporate financial credit certification: TROY got the D&B Credit financial risk management certification of Dun & Bradstreet, Inc. annually since 2011.

『泰映科技』是一家具備創新精神、設計理念、系統發展的公司。

以滿足顧客需求為中心，思考產品應具備的特性及功能；以色彩、造型、質感為研發設計訴求，顛覆傳統對工業產品的既有觀感；確立產品的自有特色與市場定位；將複雜的技術理論化身為簡單、易用、可靠的產品；徹底落實『品質』、『技術』、『服務』的經營理念。

TROY is a company with an innovative spirit, design concept, and system development.

We think about the features and functions of products focused on customer needs. Through the color, shape, texture for the R & D design appeal to establish the product's own characteristics and market positioning; to subvert the traditional impression of industrial products. Incorporate complex technical theories into simple, easy-to-use, and reliable products; to thoroughly implement the business philosophy of "Quality, Technology, Service all-in-one".

## 製造體系架構

Manufacturing system architecture

馬達・減速機・驅動器・控制器

Motors・Gearboxes・Motor Drivers・Motor Controllers

可依客戶需求提供ODM及OEM的專業服務

ODM & OEM professional service by demand



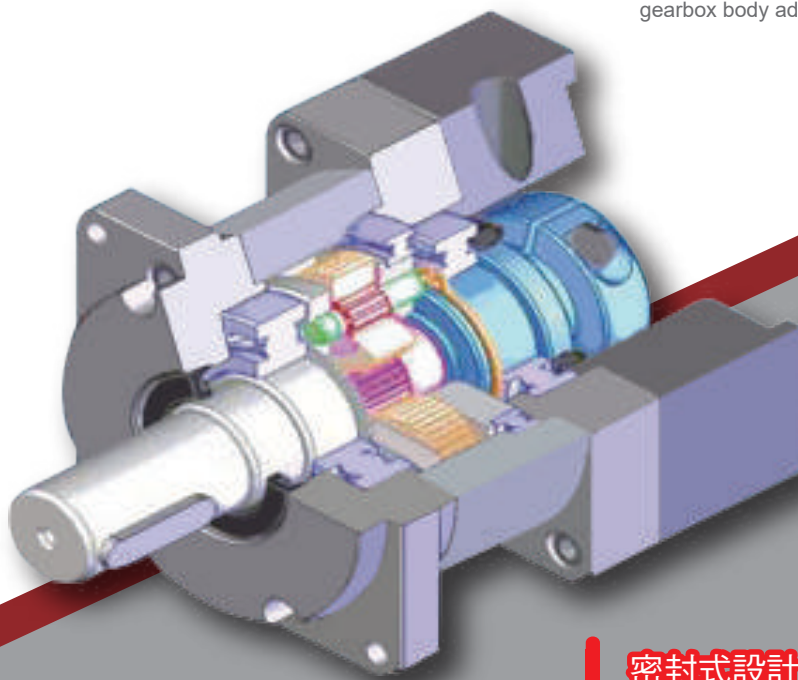
# 減速機結構特色

## Gearbox Structure Features

### 一體化設計 提升結構強度

#### Integrated Design to Enhance the Structural Strength

- ◆ 精密型/標準型，皆採直接在減速機本體內部進行內環齒的滾製，提高齒輪系嚙合精度與結構強度  
Both of the precision type / standard type have been conducted rolled for its inner ring tooth to enhance the precision engagement and structural strength to the gearbox.
- ◆ 出力軸與行星齒輪架一體加工成型，提升減速機的最大容許轉矩  
Integral processing and molding for output shaft and planetary gearbox wheel frame to enhance the maximum permissible torque of the gearbox.



### 合金鋼材質SKIVING製程

#### Alloy Steel Material SKIVING Process

- ◆ 全系齒輪採用高韌性、高強度的SCM系合金鋼材質  
Full gear series adopts high toughness and high strength SCM series alloy steel material.
- ◆ 齒輪採SKIVING滾齒製程，提高齒輪系嚙合精度  
Gear adopts SKIVING hobbling process, improve the mesh accuracy for the gear train.

### 雙螺絲鎖付軸心固定方式

#### Fixing Method Of Double Screws For Locking Output Shaft

- ◆ 馬達軸心與減速機連結方式採對邊雙螺絲鎖付方式，提升締結的鎖緊力  
Link method for motor output shaft and gearbox adopts opposite double screw locking way to enhance the locking force to the linkage.

### 耐環境性表面特殊處理

#### Special Surface Processing For Environmental Resistance

- ◆ 本體合金鋼材部分採無電解鍍表面光亮處理  
Alloy steel material part of the gearbox body adopts no electrolytic nickel surface bright processing.
- ◆ 前後蓋鋁合金材部分採陽極電著皮膜處理  
Front and rear cover aluminum alloy material part of the gearbox body adopts anode electricity film processing.

### 密封式設計 無須更換潤滑油

#### Sealed Design Without Replacing Lubricating Oil

- ◆ 配置前後二段油封，潤滑油不會洩漏  
With before and after two oil seals, the lubricating oil will not leak out.
- ◆ 採用耐極壓性合成潤滑油脂，無須換油保養  
Use extreme pressure resistance synthetic lubricants, there is no need to replace lubricating oil for maintenance.

### 模組化多樣式馬達安裝

#### Modular Multi-Style Motor Mounting Surface

- ◆ 多樣式馬達安裝面選用，可搭配各廠牌伺服、無刷、步進馬達安裝  
Multi-style motor mounting surface choice for matching with all brands of servo, brushless, stepper motor.

**高精度 · 高機械剛性**  
High Precision · High Mechanical Rigidity



**減速比：3-100**

Gearbox Ratio

**搭配馬達容量：0.1KW-5KW**

Available Motor Capacity

**精密型**

Precision Type

**背隙5-8分**

Backlash 5~8 arc-min



**標準型**

Standard Type

**背隙6-10分**

Backlash 6~10 arc-min





## 低背隙行星式減速機

LOW Backlash Planetary Gearbox

## Contents

品名看法 Model Name	01
減速機比數一覽表 Gearbox Ratio List	02
精密型 Precision Type	02
標準型 Standard Type	03
規格&額定輸出轉矩 Specification & Rated Output Torque	04
外形尺寸圖&馬達安裝面編碼說明 Dimension & Motor Mounting Surface Coding Instruction	05
安裝說明 Installation Instruction	07
產品保固及注意事項 Product Warranty Precaution	08

提供好的產品與服務給客戶  
Provide good products and services to customers  
協助客戶提升競爭力  
To Enhance Customers Competitiveness  
是 **TROY** 對您的承諾!!  
Is TROY Commitment To You !!

Planetary  
Gearbox

# Planetary Gearbox

## 行星式減速機

### ■ 品名看法 Model Name

9 P 5 G - 1

安裝面尺寸 Installation Sizes	產品系列 Product Series	減速比 Gearbox Ratio	型式 Type	馬達安裝面編碼 Motor Mounting Surface Coding
<b>6</b> 精密型(方形) Precision type (square type) □60mm 標準型(圓形) Standard type (circular type) □62mm	行星式減速機 Planetary Gearbox	<b>3</b> 1/3 <b>25</b> 1/25 <b>4</b> 1/4 <b>28</b> 1/28 <b>5</b> 1/5 <b>30</b> 1/30 <b>7</b> 1/7 <b>35</b> 1/35 <b>10</b> 1/10 <b>40</b> 1/40 <b>12</b> 1/12 <b>50</b> 1/50 <b>15</b> 1/15 <b>70</b> 1/70 <b>16</b> 1/16 <b>100</b> 1/100 <b>20</b> 1/20	<b>H</b> 精密型(方形) Precision type (square type) <b>G</b> 標準型(圓形) Standard type (circular type)	<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b> <b>6</b> <b>7</b> <b>8</b> <b>9</b> <b>S</b> 訂製品(詳如下述) Customized products (details as follows)
<b>9</b> □90mm <b>12</b> □120mm <b>15</b> □142mm				

\*精密型與標準型提供比數各有不同，請詳閱頁碼P.2~3  
 \*Precision and standard type provide different gearhead ratio, Please refer to page P.2 ~3.

### 訂製品 Customized Products

9P5G - S 1 A B C d

訂製品 Customized Products	馬達安裝面編碼 Motor Mounting Surface Coding	變更部位 A Modification Part A	需求尺寸 Demand Size	變更部位 B Modification Part B	需求尺寸 Demand Size	變更部位 C Modification Part B	需求尺寸 Demand Size	變更部位 d Modification Part d	需求尺寸 Demand Size
	<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b> <b>6</b> <b>7</b> <b>8</b> <b>9</b>	馬達安裝面 尺寸PCD ∅ Motor Installation Dimension		螺絲孔 Screw Holes		馬達凸緣 尺寸 ∅ Motor Flange Size		馬達軸徑∅ Motor Shaft Diameter	

\*毋需變更之部位，則不必列出。  
 \*To no need for changing part will not be listed.



### ■ 減速機比數一覽表 Gearbox Ratio List

#### 精密型 Precision Type

使用馬達規格 Motor Specification		減速比 Gearbox Ratio	低減速比 Low Gearbox Ratio					中減速比 Medium Gearbox Ratio												
功率 (W) Power	轉速 (r/min) Speed		型號 Model	3	4	5	7	10	12	15	16	20	25	28	30	35	40	50	70	100
100	3000	6P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
200	3000	6P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
		9P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
400	3000	6P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆						
		9P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆
500	2000	9P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆							
		12P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
750	3000	9P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆							
		12P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
1K	2000	9P□H-□	◆	◆	◆	◆														
		12P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
		15P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
1.5K	2000	9P□H-□	◆	◆	◆	◆	◆													
		12P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆						
		15P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
2K	3000	12P□H-□	◆	◆	◆	◆	◆	◆	◆											
	2000	15P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
3.5K	3000	12P□H-□	◆	◆	◆	◆	◆	◆	◆											
	2000	15P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆					
5K	3000	12P□H-□	◆	◆	◆	◆	◆	◆	◆											
	2000	15P□H-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆							

※1：上述“◆”記號為可選用之減速比。

Above “◆” mark is selectable gearbox ratio.

※2：100比以上之高比數減速機為訂製品，若有需要請洽各營業所。

The gearbox ratio which is higher than 100 is customized, if necessary, please contact our local sales.

※3：負載慣性慣量較大的場合，減速機型號請加大一級使用，若有特殊需求請洽各營業所。

Under larger load inertia occasion, please use the larger ratio level gearbox. If you have special spec, please contact our sales.



## 標準型 Standard Type

使用馬達規格 Motor Specification		減速比 Gearbox Ratio	低減速比 Low Gearbox Ratio					中減速比 Medium Gearbox Ratio												
功率 (W) Power	轉速 (r/min) Speed		型號 Model	3	4	5	7	10	12	15	16	20	25	28	30	35	40	50	70	100
100	3000	6P□G-□		◆	◆	◆	◆			◆	◆	◆	◆		◆	◆	◆	◆	◆	
200	3000	6P□G-□		◆	◆	◆	◆			◆	◆	◆	◆		◆	◆	◆			
		9P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆
400	3000	6P□G-□		◆	◆	◆	◆			◆	◆	◆	◆							
		9P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆
500	2000	9P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆							
		12P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
750	3000	9P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆							
		12P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
1K	2000	9P□G-□	◆	◆	◆	◆														
		12P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
		15P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
1.5K	2000	9P□G-□	◆	◆	◆	◆	◆													
		12P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆						
		15P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
2K	3000	12P□G-□	◆	◆	◆	◆	◆	◆	◆											
	2000	15P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
3.5K	3000	12P□G-□	◆	◆	◆	◆	◆	◆	◆											
	2000	15P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆					
5K	3000	12P□G-□	◆	◆	◆	◆	◆	◆	◆											
	2000	15P□G-□	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆							

※1：上述“□”記號為可選用之減速比。

Above "□" mark is selectable gearbox ratio.

※2：100比以上之高比數減速機為訂製品，若有需要請洽各營業所。

The gearbox ratio which is higher than 100 is customized, if necessary, please contact our local sales.

※3：負載慣性慣量較大的場合，減速機型號請加大一級使用，若有特殊需求請洽各營業所。

Under larger load inertia occasion, please use the larger ratio level gearbox. If you have special spec, please contact our sales.



# Planetary Gearbox

## 行星式減速機

### ■ 規格 Specifications

安裝面(mm) Mounting Surface		精密型 Precision Type	□60	□90	□120	□142	
		標準型 Standard Type	□62				
型式 Type	精密型 Precision Type □P□H-□	型號 Model		6P□H-□	9P□H-□	12P□H-□	15P□H-□
		背隙 Backlash (arc-min)	3-10比 Ratio	≤ 5			
	12-100比 Ratio		≤ 8				
	標準型 Standard Type □P□G-□	型號 Model		6P□G-□	9P□G-□	12P□G-□	15P□G-□
背隙 Backlash (arc-min)		3-10比 Ratio	≤ 6				
			12-100比 Ratio	≤ 10			
最大輸出轉矩Max. Output Torque (Nm)			3倍額定輸出轉矩 3 Times of Rated Output Torque				
額定輸入轉速Rated Input Speed (r/min)			3000				
扭轉剛性Torsional Rigidity (Nm/arc-min)			5	18	28	51	
容許徑向力Max. Radial Force (N)			1100	2000	5500	9000	
容許軸向力Max. Axial Force (N)			550	1000	2750	4500	
效率Efficiency (%)	3-10比 Ratio		96				
	12-100比 Ratio		93				
重量Weight (Kg)	3-10比 Ratio		1.6	4.5	8.0	17.0	
	12-100比 Ratio		2.0	6.0	11.0	22.0	
使用溫度Operation Temperature (°C)			-10~+80				
潤滑油Lubrication			耐極壓型合成油脂 Extreme Pressure Resistance Type Synthetic Grease				
安裝方向 Mounting Position			任意方向 Any Direction				
噪音值Noise Level (dB)※			≤ 65		≤ 68		

※ 在一般環境的背景噪音下，以噪音計距離減速機本體1cm進行量測。

Under the background noise of general environment, please use noise meter to measure from the distance 1cm to the gearbox body.

### ■ 額定輸出轉矩 Rated output torque

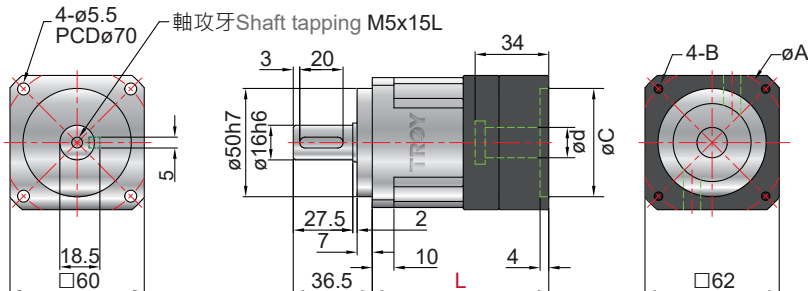
減速比 Gearbox Ratio		低減速比 Low Gearbox Ratio					中減速比 Medium Gearbox Ratio													
		3	4	5	7	10	12	15	16	20	25	28	30	35	40	50	70	100		
額定輸出轉矩 Rated output torque	精密型 Precision Type	6P□H-□	50	45	50	50	35	45	50	45	50	50	50	50	52	50	40	35	35	35
		9P□H-□	75	90	100	100	75	75	75	90	90	100	90	75	100	75	75	75	75	75
		12P□H-□	208	290	330	300	230	208	208	290	290	330	290	330	330	290	330	300	230	230
		15P□H-□	342	542	650	550	450	342	342	542	542	650	542	342	650	542	650	550	450	450
	標準型 Standard Type	6P□G-□	-	45	50	50	35	-	-	45	50	50	50	-	50	40	35	35	35	
		9P□G-□	75	90	100	100	75	75	75	90	90	100	90	75	100	75	75	75	75	
		12P□G-□	208	290	330	300	230	208	208	290	290	330	290	330	330	290	330	300	230	
		15P□G-□	342	542	650	550	450	342	342	542	542	650	542	342	650	542	650	550	450	



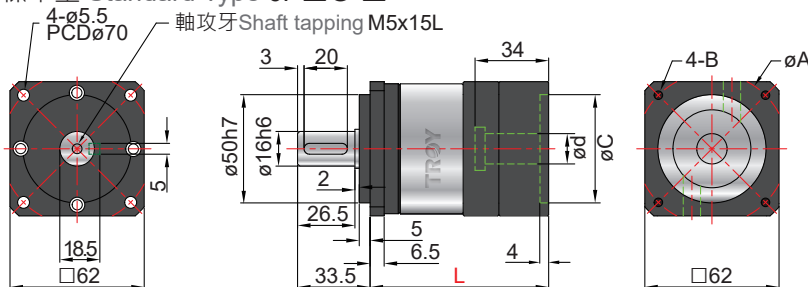
## ■ 外形尺寸圖 Dimension

### □60mm / □62mm

#### ◆ 精密型 Precision Type 6P□H-□

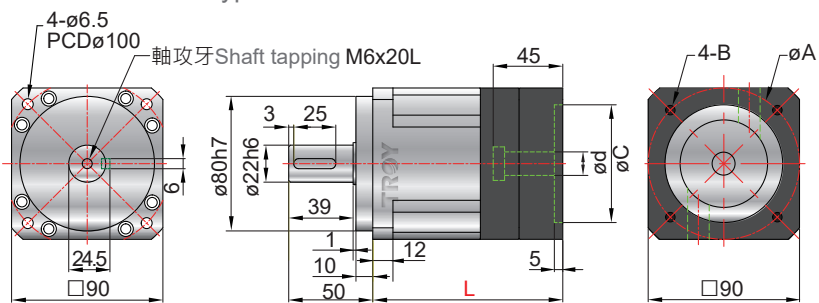


#### ◆ 標準型 Standard Type 6P□G-□

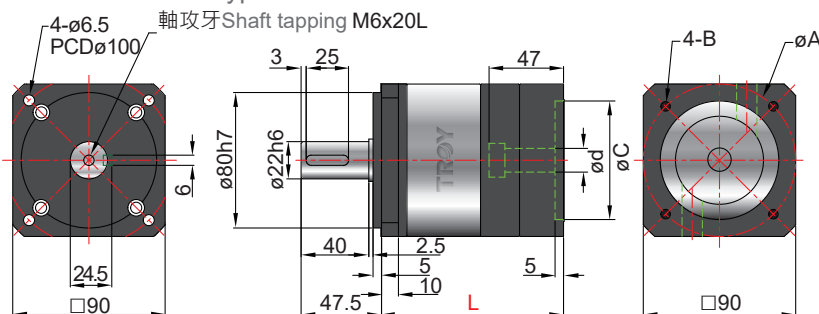


### □90mm

#### ◆ 精密型 Precision Type 9P□H-□



#### ◆ 標準型 Standard Type 9P□G-□



※1：馬達安裝面編碼所對應的尺寸會依各廠牌馬達的不同而有所差異，請做再次確認。  
The size of the motor mounting surface coding will be different depends on all brands motor. Please confirm the spec again.

※2：若您需求的馬達安裝面尺寸不在表格中，請提供馬達尺寸以做進一步確認。  
If your required motor mounting surface size is not in the table, please provide the motor size tous for further confirmation.

※3：本公司擁有尺寸變更的權利。  
Our company has the right of changing size.

(單位Unit : mm)

馬達 Motor				
安裝面編碼 Mounting Surface Coding	安裝面尺寸 Mounting Surface Size	螺絲孔 Screw Hole	凸緣尺寸 Flange Size	軸徑 Shaft
NO.	PCD ØA	B	ØC	Ød
1	46	M3	30	8
2		M4		50
3	14			
4				
5	70	M5	70	14~16
6		M6		
7	66.7	M4	38.1	6.35
8				
9	70	M4	47	6
A				
B	70.7	M4	36	8
C				10

#### 本體長度 Body Length L

型式 Type	比數 Ratio	3~10比 Ratio	12~100比 Ratio
	精密型 Precision Type	81.5	105.5
標準型 Standard Type	82.5	105.5	

(單位Unit : mm)

馬達 Motor				
安裝面編碼 Mounting Surface Coding	安裝面尺寸 Mounting Surface Size	螺絲孔 Screw Hole	凸緣尺寸 Flange Size	軸徑 Shaft
NO.	PCD ØA	B	ØC	Ød
1	70	M4	50	11
2		M5		70
3	16			
4				
5	90	M6	80	16
6		19		
7	100	M8	83	14
8				10
9	104	M8	83	12
A				14
B	98.9	M5	60	14
C				12
D	73	M5	73	14
E				12
F	14			

#### 本體長度 Body Length L

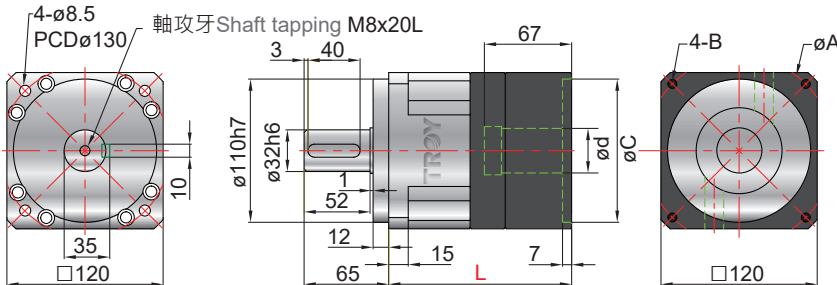
型式 Type	比數 Ratio	3~10比 Ratio	12~100比 Ratio
	精密型 Precision Type	113	144
標準型 Standard Type	107.5	134.5	

# Planetary Gearbox

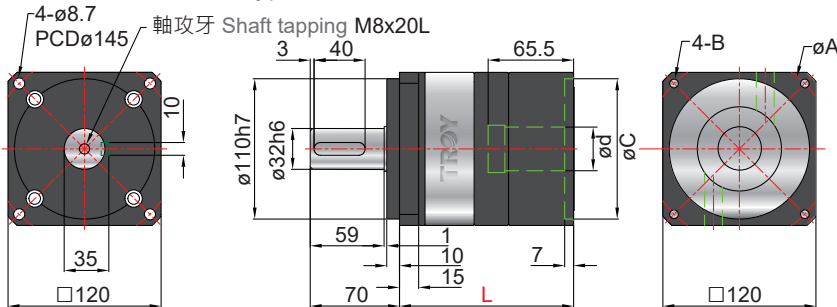
## 行星式減速機

### □120mm

#### ◆ 精密型 Precision Type 12P□H-□



#### ◆ 標準型 Standard Type 12P□G-□



(單位Unit : mm)

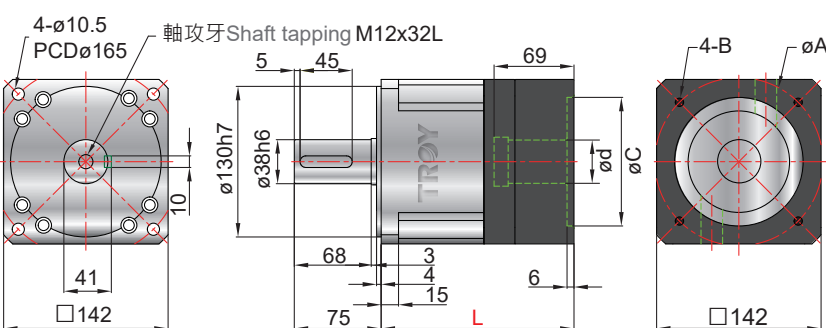
馬達 Motor				
安裝面編碼 Mounting Surface Coding	安裝面尺寸 Mounting Surface Size	螺絲孔 Screw Hole	凸緣尺寸 Flange Size	軸徑 Shaft
NO.	PCD ØA	B	ØC	Ød
1	90	M6	70	16
2		M5		19
3	100	M6	80	19
4				19
5	145	M8	110	19
6				22
7				24
8				28

### 本體長度 Body Length L

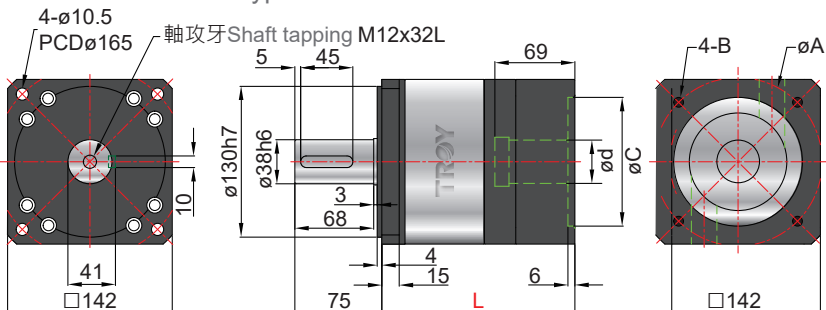
		比數 Ratio	
型式 Type	馬達安裝面編碼 Motor Mounting Surface Coding	3~10比 Ratio	12~100比 Ratio
精密型 Precision Type	1~4	140.5	171.5
	5~8	150.5	181.5
標準型 Standard Type	1~4	136.5	167.5
	5~8	146.5	177.5

### □142mm

#### ◆ 精密型 Precision Type 15P□H-□



#### ◆ 標準型 Standard Type 15P□G-□



(單位Unit : mm)

馬達 Motor				
安裝面編碼 Mounting Surface Coding	安裝面尺寸 Mounting Surface Size	螺絲孔 Screw Hole	凸緣尺寸 Flange Size	軸徑 Shaft
NO.	PCD ØA	B	ØC	Ød
1	145	M8	110	19
2				22
3				24
4				28
5	165	M10	130	32
6	200	M12	114.3	35
7				42
8	215		180	38

### 本體長度 Body Length L

		比數 Ratio	
型式 Type	馬達安裝面編碼 Motor Mounting Surface Coding	3~10比 Ratio	12~100比 Ratio
精密型 Precision Type	1~5	166.5	212.5
	6~8	186.5	232.5
標準型 Standard Type	1~5	166.5	212.5
	6~8	186.5	232.5

※1：馬達安裝面編碼所對應的尺寸會依各廠牌馬達的不同而有所差異，請做再次確認。  
The size of the motor mounting surface coding will be different depends on all brands motor.  
Please confirm the spec again.

※2：若您需求的馬達安裝面尺寸不在表格中，請提供馬達尺寸以做進一步確認。  
If your required motor mounting surface size is not in the table, please provide the motor size tous for further confirmation.

※3：本公司擁有尺寸變更的權利。  
Our company has the right of changing size.

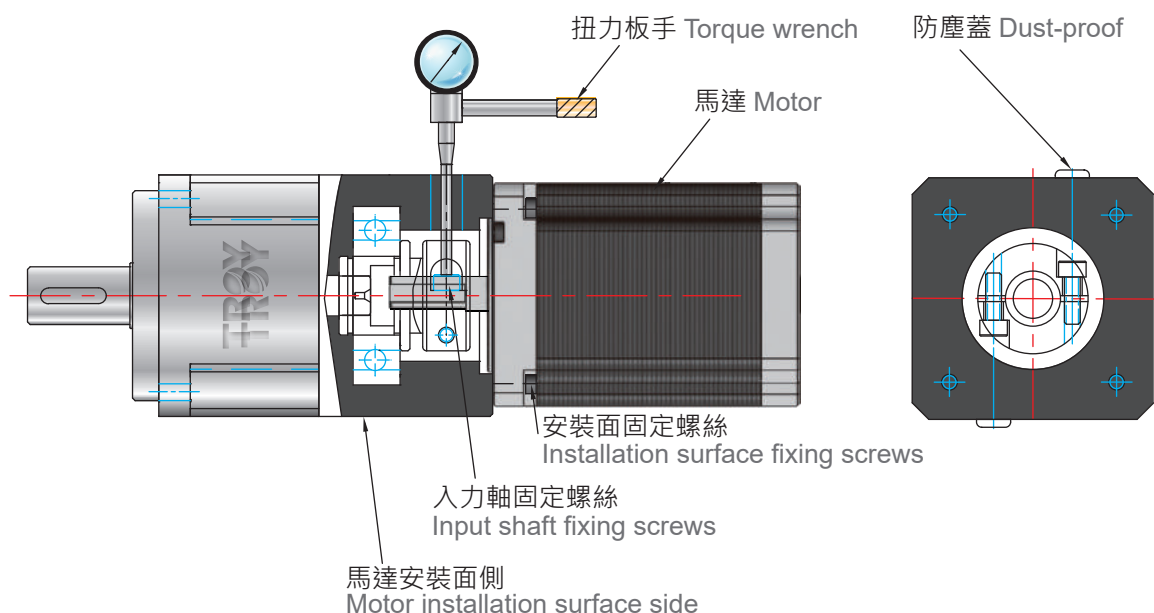


## ■ 減速機與馬達安裝順序 Gearbox and Motor Installation Sequence

1. 將馬達出力軸擦拭乾淨  
Wipe the motor output shaft clearly.
- ↓
2. 將馬達裝入減速機內並鎖緊螺絲  
Install the motor into the gearbox and lock the screws.
- ↓
3. 將減速機入力軸套的兩顆螺絲鎖緊(螺絲鎖緊的扭力請參考下表)  
Lock the two screws of the gearbox input shaft sleeve. (Please refer to the following table for screw locking torque)
- ↓
4. 將防塵蓋裝入減速機  
Put dust-proof cover into the gearbox.

## ■ 螺絲鎖緊的扭力 Screw Locking Torque

螺絲規格 Screw Specification		M3	M4	M5	M6	M8	M10	M12
鎖緊扭力 Locking Torque	Nm	0.2	0.45	0.9	1.53	3.0	7.35	12.8
	kgcm	2.0	4.5	9.0	15.3	30.0	73.5	128.0



### ■ 保固內容 Warranty Content

#### 1. 保固期間 Warranty period

本公司的產品保固期間為購買產品後抑或是將產品交貨至指定地方後一年內。

Our company's products warranty period is after purchasing or after delivering products to the designated place within one year.

#### 2. 保固範圍 Warranty range

保固期間內，若產品因非人為因素而發生故障，客戶將產品寄回，本公司免費更換受損零件。但因下列故障原因不在保固範圍內：

During the warranty period, if the product have malfunction condition due to non-human factors, customers need to ship the product back for us our freely replace damaged parts . But the following reasons does not be covered in the warranty range:

a) 不在本目錄或規格書內所規定的條件、環境的使用下所造成的故障。

The faults caused by not the prescribed condition and the using environment to the contents of this catalog or specification.

b) 非產品本身原因所造成的故障。

The faults caused by non-product itself reason.

c) 未依照原本設計之使用方式所造成的故障。

The faults caused by not in accordance with the original design of using way.

d) 非經由本公司所進行的改裝或維修所造成的故障。

The faults caused by non-via modification or maintenance from our company.

e) 其他天然、自然災害等不可抗力所導致的故障。

The faults caused by other force majeure factor like natural disasters.

此外，上述保固僅限於本公司產品本身，因產品故障所導致之相關損失並不包含在本保固範圍內。Besides, above warranty is only limited to our company's products. If the related losses due to products' malfunction does not be included within the scope of warranty.

### ■ 責任限制 Limitation of Liability

關於因本公司產品所引發之一切特別損害、間接損害、消極損害(應得利益之喪失)，本公司不負任何責任。

About the all special damages, indirect damages and negative damages (loss of deserve benefits) caused by our company's products, we will assume no responsibility.

### ■ 選購時，應符合用途條件

#### Compliance using application conditions while purchasing

將本公司產品與其他產品搭配使用時，請確認是否符合客戶所需之規格、法規或限制等。此外，請客戶自行確認目前所使用的系統、機械或是裝置是否適用於本公司產品。如未確認是否符合或適用時，本公司無須對本公司產品的適用性負責。

When use our company's products with other products, make sure it meets customer's required specification, regulation and restriction or not. Besides, let customers confirm their own using systems, mechanical parts and device is suitable for our present company's product or not. If not confirming the compliance or suitability, our company will not be responsible for the suitability of our company's products.

### ■ 潤滑 Lubrication

減速機為密封式設計，不需換油。

Gearbox belongs to sealed design , it has no need to replace lubricating oil.

油品採用耐極壓型合成油脂。

Lubricating oil adopts the extreme pressure resistance synthetic lubricants.

周圍使用溫度0~+40°C。

Ambient temperature 0 ~ + 40°C

減速機本體最高容許溫度85°C以下。

The max. permissible ambient temperature to the gearbox body : below 85°C

※：工作場合溫度0°C以下，訂購前需註明清楚。

Under workplace temperature below 0°C, please indicate it clearly before ordering.



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