

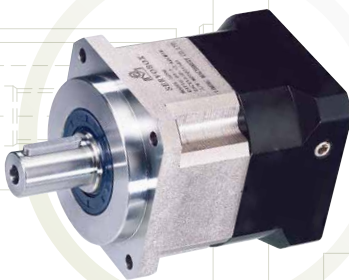
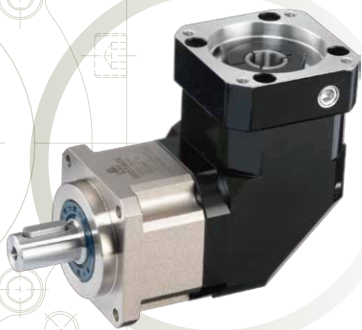
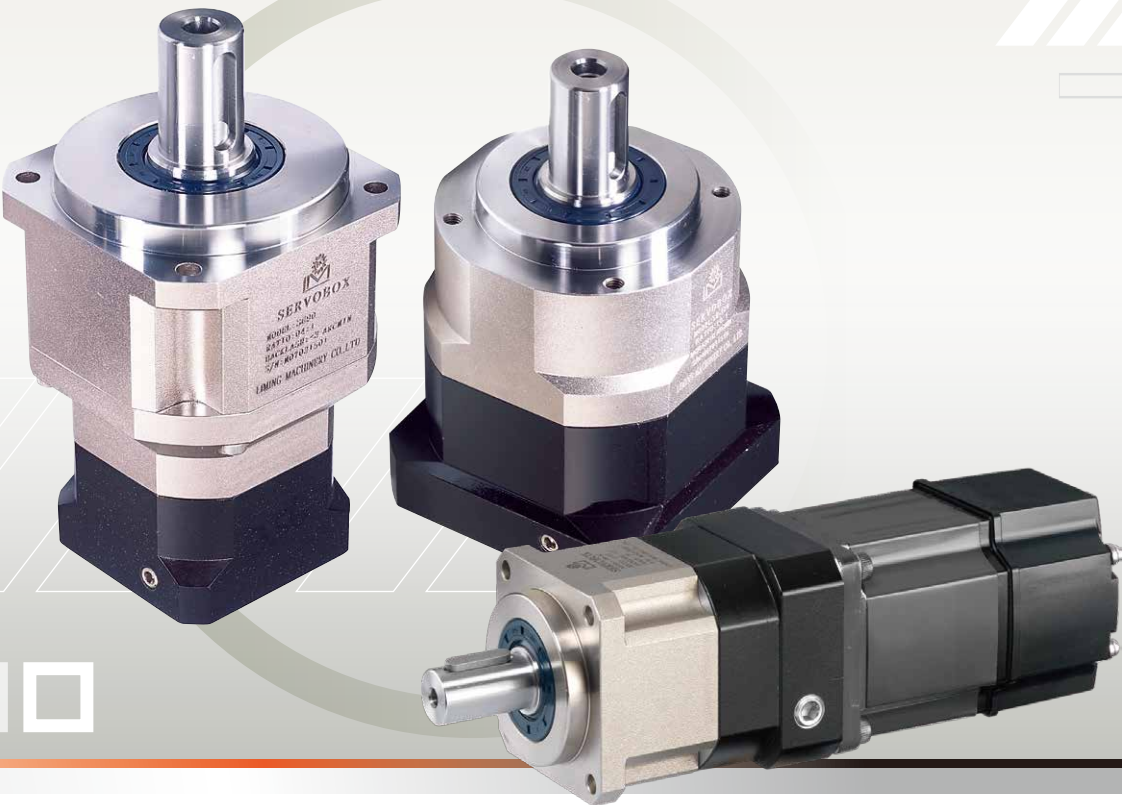
Preview

[2025]



Planetary Reducers 精密行星減速機

SERVOBOX Series



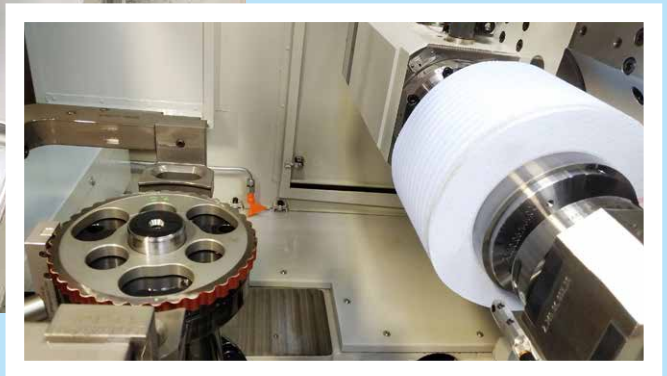
【 傳動裝置的解決方案 / 減速機的領導品牌 】

LI MING MACHINERY CO., LTD.



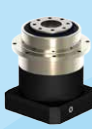
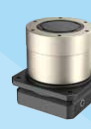
Quality First & Customer's Satisfaction





High Precision Planetary Reducers

高 精 密 伺 服 用 行 星 減 速 機

螺旋齒輪 Helical Gear						
1'、3'、5'、7'				≤ 6'		
3'、5'、7'、9'				≤ 8'		
SB  22	SE  46	SF  96	SA  64	SD  70	SDD  78	SR  90
3、4、5、6、7、8、9、10			3、4、5、7、10	4、5、7、10		2、3、4、6、9
15、20、25、30、35、40、50、60、70、80、90、100			15、20、25、30、35、40、50、70、100	20、25、35、40、50、70、100		10、15、20、24、30、36、40、45、60、90
V	V	-	-	-	-	-
滾珠軸承 Ball	滾珠軸承 Ball	滾錐軸承 Tapper	滾珠軸承 Ball	滾珠 / 滾錐 Ball / Tapper	滾珠 / 滾錐 Ball / Tapper	滾珠軸承 Ball
Bore-Hole	Screw	Bore-Hole	Screw	Bore-Hole	Bore-Hole	Screw
6mm ~ 75mm	6mm ~ 75mm	6mm ~ 55mm	6mm ~ 32mm	6mm ~ 55mm	-	10mm ~ 28mm
100W ~ 75kW	100W ~ 75kW	100W ~ 30kW	100W ~ 3.75kW	100W ~ 30kW	-	400W ~ 2.2kW

Gear Type

Backlash (1-Stage)

Backlash (2-Stage)

Type

Page

Ratio (1-Stage)

Ratio (2-Stage)

Ratio (3-Stage)

Bearing Type

Fixed Reducer

Input Bore

Input Power

SERVOBOX®

螺旋齒輪 & 螺旋傘齒輪 Helical Gear & Spiral Bevel Gear				螺旋齒輪 & 戟齒輪 Helical Gear & Hypoid Gear	
2'、4'、6'、8'		2'、4'、6'、8'		-	
4'、7'、9'、12'		-		4'、7'、10'	
SBL	SEL	SFL	SDL	SBT	SDH
					
38	56	102	74	44	82
3、4、5、6、7、8、9、10、 12、14、16、18、20		4、5、7、 10、14、20		3、4、5、6、7、8、 9、10、15、20、25、 30、35、40、45、50	-
15、20、25、30、35、 40、50、60、70、80、90、 100、120、140、160、180、200		20、25、35、 40、50、70、 100、140、200		-	20、25、35 50、70、100、150
V	V	-	-	-	-
滾珠軸承 Ball	滾珠軸承 Ball	滾錐 Tapper	滾珠 / 滾錐 Ball / Tapper	滾珠軸承 Ball	滾珠 / 滾錐 Ball / Tapper
Bore-Hole	Screw	Bore-Hole	Bore-Hole	Bore-Hole	Bore-Hole
6mm ~ 55mm	6mm ~ 55mm	6mm ~ 55mm	6mm ~ 55mm	6mm ~ 55mm	6mm ~ 55mm
100W ~ 30kW	100W ~ 30kW	400W ~ 30kW	100W ~ 30kW	100W ~ 30kW	100W ~ 30kW

SERVOBOX

Precision Planetary Reducers

精密伺服行星減速機

螺旋齒輪 Helical Gear							
<8'	<8'				<8'	-	
<10'	<12'				<10'	-	
PB  108	SN  128	FA  136	FB  142	FE  148	FC  152	FN  160	FD  166
3、4、5、 6、7、8、9、10	3、4、5、7、10						
15、20、25、 30、35、40、50、 60、70、80、90、100	15、20、25、30、35、40、50、70、100						
Bore-Hole	Screw	Screw	Bore-Hole	Screw	Bore-Hole	Bore-Hole	Bore-Hole
6mm ~ 55mm	5mm ~ 38mm	6mm ~ 55mm	6mm ~ 55mm	6mm ~ 55mm	8mm ~ 38mm	8mm ~ 38mm	6mm ~ 38mm
100W ~ 30kW	100W ~ 7.5kW	100W ~ 30kW	100W ~ 30kW	100W ~ 30kW	100W ~ 7.5kW	100W ~ 7.5kW	100W ~ 7.5kW

Gear Type

Backlash (1-Stage)

Backlash (2-Stage)

Type

Page

Ratio (1-Stage)

Ratio (2-Stage)

Fixed Reducer

Input Bore

Input Power

FABGEAR®

螺旋齒輪 & 螺旋傘齒輪
Helical Gear & Spiral Bevel Gear

<10'

<12'

-

-

-

-

PBL

PBT

SNL

FCL

FNL



120

126

134

158

164

3、4、5、
6、7、8、9、10、
12、14、16、18、20

3、4、5、6、7、8、
9、10、15、20、25、
30、35、40、45、50

3、4、5、6、7、8、
9、10、15、20、25、
30、35、40、50

3、4、5、6、7、8、9、10、
15、20、30、40、50

15、20、25、30、35、
40、50、60、70、80、90、
100、120、140、160、180、200

-

-

-

-

Bore-Hole

Bore-Hole

Screw

Bore-Hole

Bore-Hole

6mm
~
55mm

6mm
~
55mm

6mm
~
38mm

8mm
~
35mm

8mm
~
35mm

100W
~
30kW

100W
~
30kW

100W
~
7.5kW

100W
~
5.5kW

100W
~
5.5kW

FABGEAR



High Tech

H i g h P r e c i s i o n

傳動裝置的解決方案 / 減速機的領導品牌

品質至上、顧客滿意

利茗機械股份有限公司專業從事高科技的各種減速馬達、螺旋齒輪減速機、蝸桿蝸輪減速機，以及行星式減速機的設計、研發、生產。近年來肩負著顧客們對產品質量與價格的追求，不斷地在提高減速機的高性能，實現效率的最大化和提供廣泛的技術資源等方面做著不懈的努力。公司奉行『品質至上、顧客滿意』及『勤、誠、信』的經營理念、不斷吸納專業人才，使得公司始終擁有一批掌握業界高階技術的科技人才。公司以積極務實的作風，借鑒各種先進的管理經驗，不斷實現自我完善，建立起良好企業文化。

在減速機家族中，行星減速機以其體積小，承受扭力大，傳動效率高，減速範圍寬，精度高，而被廣泛應用於伺服、步進、直流等傳動系統中。在保證精密傳動的前提下，主要被用來降低轉速，增大扭矩和降低負載電機的轉動慣量比。高扭矩，低背隙及運轉安靜是 LIMING 減速機三大設計特點。LIMING 減速機一直位居市場領導地位。

Quality Supreme & Customer's Satisfaction

LI MING Machinery CO., LTD. is specialist in design, R&D and manufacturing of a wide range of high-tech gear motor and helical gear reducers, worm gear reducers, planetary gear reducers. In recent years, to meet customers' requirements of quality and price, we have been dedicated to constantly upgrade the performance of gear reducer, maximize efficiency, and provide the most comprehensive technical supports. Under the company's policy of " Quality Supreme; Customer Satisfaction and Intelligence; Sincerity; Honesty " , we have invited many highly experienced talents. At LI MING, we have a team with outstanding background in high-tech field. LI MING's outstanding enterprise culture results from its practicality, constantly learning the advanced management system and a commitment to excellence.

The Art of Transmission



High Accuracy & Efficiency Profit

Among the wide range of speed reducers, the planetary gear reducer features compact construction, high-torque resistance, high transmission efficiency, wide range of speed reduction and high accuracy.

The planetary gear reducers are widely applied in servo, stepping and DC transmission system. With its outstanding feature of high precision transmission, the planetary gear reducer is excellent for reducing speed, increasing torque and reducing torsional inertia ratio. High torque, low backlash and low noise are three key features of LIMING's gear reducers, and these are the reasons why LIMING gear reducers are in the leading position in the industry.





自動化加工設備

秉持對減速機各部份零件的獨特加工特性的認知，我們自行開發設計一系列高效率自動化的加工設備，以配合系列高性能加工機械。

本公司經驗豐富的技術員，掌握零件加工特性精度控制，嚴格品質管制以確保所有零組件的精度及性能。一系列自動化加工設備為零件加工精度穩定性提供最穩固的基礎。



Integrated

Manufacturing with
Full Range of
Automatic Equipment

Integration / Automation Machining Equipment

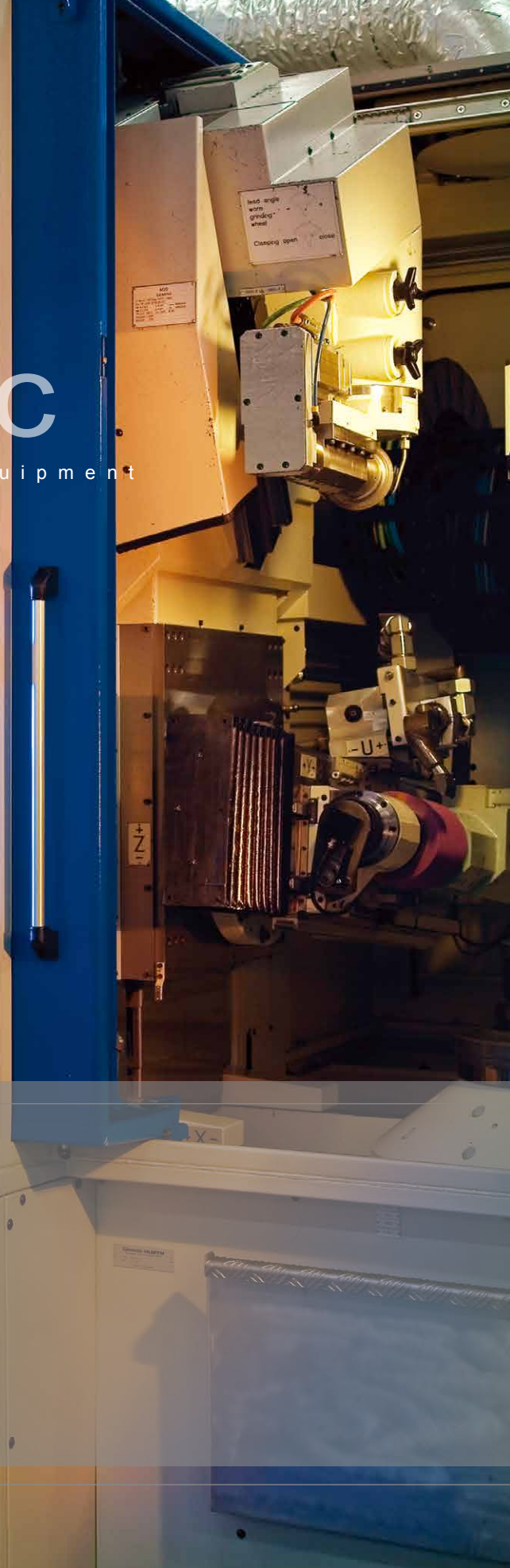
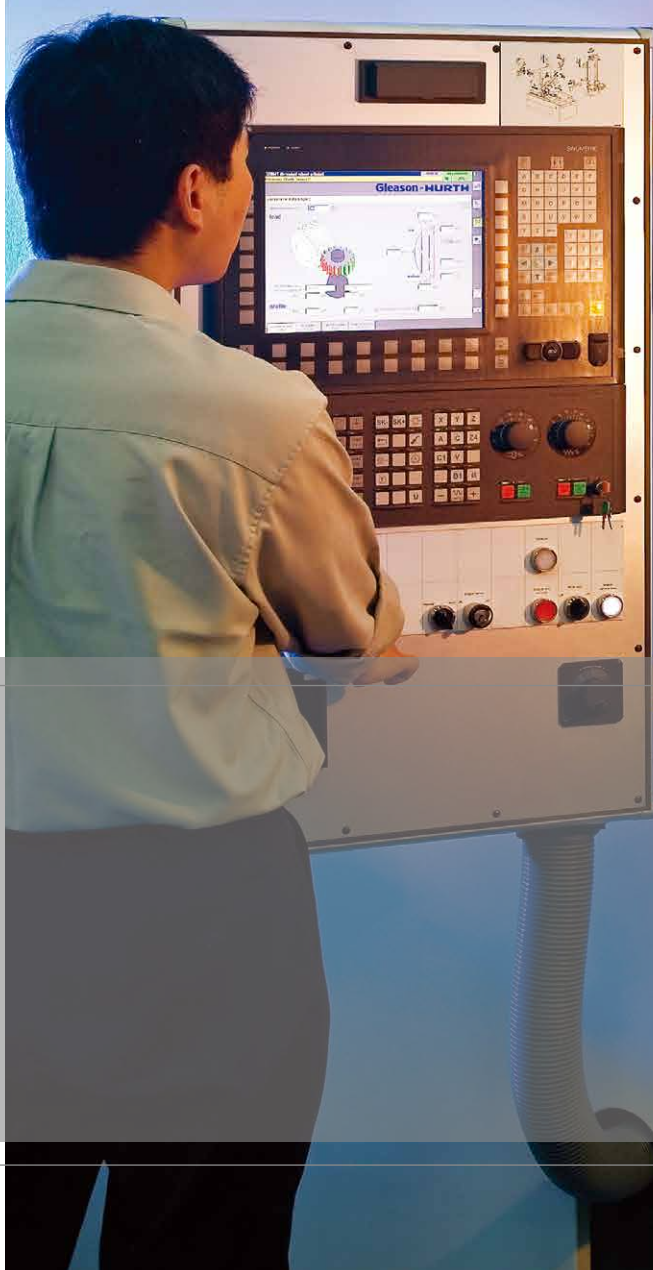


Based on our acknowledgement of the unique processing characteristics of speed reducers on all parts, we have developed and designed a series of high-efficiency automatic machining equipment to work with high-performance processing machines. Our well-experienced technicians take good control of precision in our parts, and stringent quality control to ensure the best precision and performance of all parts and components. A series of automatic processing equipment provides the most solid foundation for the consistency of precision in the machining of parts and components.



Automatic

Processing Equipment



高精密的加工設備

利茗機械公司為增進技術精良，斥資購置整套最新 CNC 電腦加工機械設備，以精密零件加工，配合優秀工程人員，提升零件精度，確保穩定的品質。

High Precision & Automatic Processing Equipment

To enhance technical improvement, LI MING Machinery Company has placed a huge investment in the purchase of a whole set of the latest generation of Computer Numerically-Controlled (CNC) machines and equipments, in combination with distinguished engineering personnel, to upgrade the precision of parts and ensure stable quality.



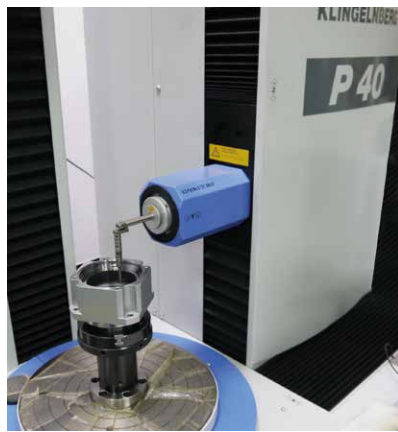


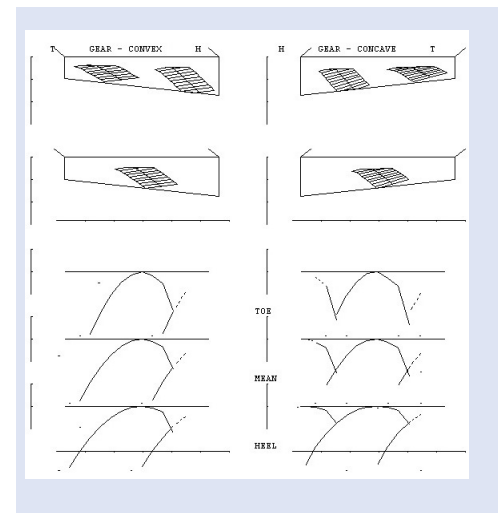
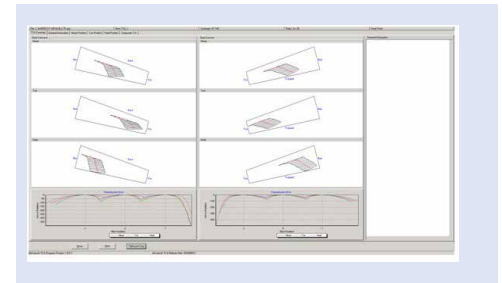
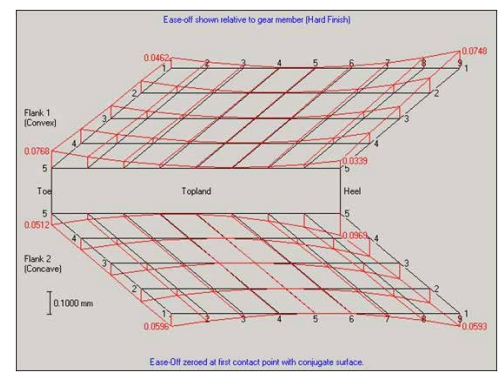
「全面品管」不只是口號

「全面品管」在利茗公司絕不是一句口號。我們對品質政策的執著，對每一個品質要求都訂有嚴格的品質標準書，迅速而確實的品質管制。每一個零件從最初的進料製程，裝配完成品的運轉等檢驗測試，鉅細靡遺，以完全符合您的要求及利茗的品質標準。品管部門有先進的檢驗設備，作精密的量測。「工欲善其事，必先利其器」，我們精密的檢驗儀器，是品質信賴的保證。

Total Quality Management (TQM) isn't a Mere Slogan

Total Quality Management (TQM) is never a mere slogan of LI MING Company. We adhere to our quality policy. To each quality requirement, we have to set up rigorous quality standards for prompt and accurate quality control every single part is subjected to comprehensive inspection and tests, from initial receipt of material to assembly of finished products and regular operation, to completely satisfy your requirement. Our quality control department has the most advanced inspection equipment conducting precision measurement. A good tool is the master of all good works, our precision inspection equipments are the best assurance of our reliable quality.





先進的製造技術

使用高端的設計軟件及世界級的高精密的加工設備，並配合全面品質管理確保設計輸入到輸出端的品質一致的閉循環 (Close Loop) 生產流程。

Using high-tech design software and world-class high-precision processing equipment, and with comprehensive quality control. Designed to ensure the quality of the input to the output of the same closed loop production process.

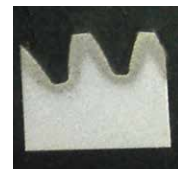
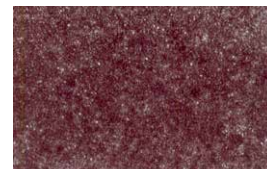
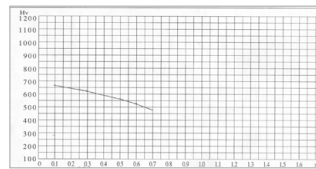


Advanced

Manufacturing Technology

The image displays four pieces of laboratory equipment from the company AZIONE. From left to right: a vacuum oven with a transparent door and a control panel; a control panel with a digital display and several buttons; a vacuum chamber with a transparent door and a control panel; and a vacuum pump with a control panel and a pressure gauge.

A large, green industrial machine, possibly a CNC lathe or mill, is shown in a factory setting. The machine has a large, dark, arched opening in the center. It is surrounded by various components, including a control panel and a large, vertical, cylindrical structure on the left. The machine is situated on a polished floor, and the background shows a large industrial building with a high ceiling and structural beams.



* 金相組織相片 Metallograph

Gear Profile/Lead

Prog. No.: G8T40D103 9	P. 26/	Date: 26.10.2007 10:52
Part: PB-142	Order: LIN	Draw: 240mm
Drawing No.: T0848-26-40	No. of teeth: 40	Draw depth: 3.99mm
Order ref.: 1	Pressure angle: 20°	Length Pz. in: 19.2mm
Inv. depth. No.: L1 MING	Module: 2	Upper Length M: 6.61mm
Inv. of diam.: AB0V80BAR	Base Dia. of db: 42.925mm	Radius: (R6) .5mm
Condition: G8TNDING	Base Dia. of a: -11.257	Lead Mod Offset: .318

left flank

PROFILE

right flank

DIN 3676

Tip

Va500:l

Vb10:l

Root

	31	21	11	1	Tooth	1	11	21	31	
	Act.value[μm]				Quality	lin.value[μm]				Quality
filom	1.5	0.9	0.9	0.9	0.1	-0.3	1	1	1	
fms	1.5	0.4	1.6	2.5	4.7	8.7	7	6.4	1.0	
fm	3.4	2.9	3.3	3.9	4	12	7	12	3.2	
fss	2.6	2.7	2.4	2.7	4	7	9	7	3.2	

left flank

LEAD

right flank

Top

Va500:l

Vb10:l

Bottom

	31	21	11	1	Tooth	1	11	21	31
	V 0.9					0.3-1			
filom	0.7	1	0.9	0.9	0.1	-0.3	1	1	1
fms	3.1	0.2	0.4	0.9	13	7	13	7	0.3
fm	2.5	1.7	2.0	2.3	19	7	19	7	1.2
fss	0.9	0.9	0.8	0.8	9	7	9	7	0.9

* Gear Profile / Lead 齒形及導程

The planetary gear and sun gear are manufactured from high quality NI-Cr-Mo alloy steel (SNM220), precision machined and carburized to hardness 57-60HRC. Precision teeth grinding assures gear accuracy reaches DIN6 class. It provides better wear resistance, impact resistance and longer service life than gears with only surface nitrided.

SERVOBOX[®]

高精密行星減速機

Characteristic of SERVBOX Series

SERVBOX 系列產品特性

利明牌精密行星減速機 SERVBOX 系列，以螺旋齒輪設計，採用精密 CNC 滾齒機加工，咬合精準、運轉順暢，低噪音。一體式的齒輪箱本體，與同規格型減速機相比，體積小 (省 1/4 以上體積與重量) 輸出扭力大、傳動效率高。

SERVBOX series high precision planetary gear reducer employs helical gears. All gears are high precision machined by CNC gear hobbing machine, providing high accuracy gear engagement, smooth running and minimum noise.

LIMING gear box is one-piece fabricated. When comparing with the competitive gear reducer, LIMING gear reducer features smaller construction (saves over 1/4 of size and weight), higher output torque and higher transmission efficiency.

低 噪 音

低於 65dB。

Low Noise

Under 65dB.

低 背 隙

單段低於 7 弧分 (arcmin)，可選擇 1 弧分規格。
雙段減速在 9 弧分以內。

Low Backlash

Backlash for 1-stage model is under 7 arcmin. Available to select specification with 1 arcmin of backlash. Backlash for 2-stage model is under 9 arcmin.

高 效 率

單段式在 97% 以上，雙段式在 94% 以上。

High Efficiency

Efficiency for 1-stage model exceeds 97%; 2-stage model exceeds 94%.

高輸入轉速

可達 5,000 RPM。

High Input Speed

Input speed allows for 5,000 RPM.

高 扭 矩

比一般正齒輪行星減速機扭矩高。

High Torque

Higher output torque is in comparison with spur gear planetary gear reducers.

高穩定性

採用高強度合金鋼材，整顆齒輪經硬化處理，非只有表面硬化，確保使用壽命及長期使用仍保持最初的精密度。

High Stability

Employs high tensile strength alloy steel. Gear hardening is made for the entire gear instead of only surface hardening, which extends gear service life and maintain high accuracy after a long period of operation.

高減速比

採模組化設計，行星齒箱可相互連結，速比可達 1/10000 以上。

High Speed Reduction Ratio

The gear reducer is a modular design. The planetary gear box can be connected. Speed reduction ratio can reach over than 1/10000.

Features of SERVBOX Series

SERVBOX 系列產品特點



螺旋齒輪設計

減速機構採用螺旋齒輪設計，齒形嚙合率為一般正齒輪的二倍以上，具有運轉平順、低噪音、高輸出扭矩和低背隙的特性。

Helical Gear Design

The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also features extremely smooth running, low noise, high torque output and low backlash.



全合成潤滑油脂

採 IP65 防護等級的密封設計，潤滑油脂不洩漏免保養。

Synthetic Lubrication Grease

The protective class IP65 seals design avoids leakage problem. It features no maintenance.



筒夾式連結機構

輸入端與馬達的連結採用筒夾式的鎖緊機構，並經動平衡分析，以確保在高輸入轉速下結合介面的同心度和平衡度，及零背隙的動力傳遞。

Collet Locking Mechanism

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.



滿針滾針軸承設計

行星齒輪的傳動介面採用不含保持器之滿針滾針軸承，增加接觸面積以提高結構剛性及使用壽命。

Full Needle Roller Bearings Design

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.



一體式行星臂架及雙懸臂設計

行星臂架與輸出軸採一體式的結構設計，以確保提高扭轉剛性及精確度。並使用一次加工完成，控制精度在公差之內。

Integrated Planetary Arm Bracket

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy. The entire structure is one-time machined for controlling accuracy in the specified tolerance.



高精度齒輪加工

行星齒輪及太陽齒輪材料採用高級之鎳鉻鉬合金鋼 (SNCM220)，切削加工後，經滲碳熱處理至硬度 57~60HRC，再進行齒面研磨，確保齒輪精度在 DIN6 級以內，比只有表面的氮化處理，獲得最佳的耐磨耗和耐衝擊韌性，壽命更長。

High Precision Gear Machining

The planetary gear and sun gear are made by high quality Ni-Cr-Mo alloy steel (SNCM220), precision machined and carburized to hardness 57-60 HRC. Precision teeth grinding assures gear accuracy reaches DIN6 class. It provides better wear resistance, impact resistance and longer service life than gears with only surface nitrided.

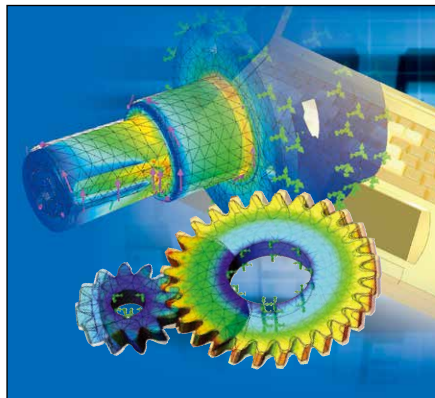


一體式齒輪箱本體

齒輪箱和內環齒輪採一體式的設計，材質為鎳鉻鉬合金鋼 SCM440，經調質後加工，輸出扭矩大，齒輪精度達 DIN6 級，精密度高，表面防鏽處理，提高環境的耐受性和抗腐蝕能力。

One-piece Gear Box & Advanced Surface Treatment

The gear box and internal gear ring are one-piece constructed, which is made by Cr-Mo alloy steel (SCM440), and tempered for high torque output. High gear accuracy meets DIN6 class standard. Gearbox surface is anti-corrosive treated for upgrading environmental-resistant and corrosion-resistant capability.

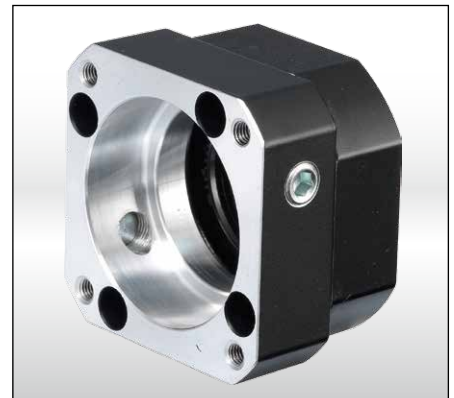


CAE 設計分析技術

利用 3D-CAE 軟體的設計分析技術，對減速機整體強度進行分析及螺旋齒面作齒形及導程修整，以降低齒輪對啮入及嚙出的衝擊和噪音，增加齒輪系及減速機的使用壽命。

CAE Design and Analysis

Employs 3D-CAE software for analysis and design, the software allows for analyzing the strength of the entire gear reducer and modifying the helical teeth profile and lead. This reduces the impact and noise during teeth engage and disengage, while increasing the service life of gears and the gear reducer.



模組化馬達連接板設計

獨特的馬達連接板模組化設計，適用於任何廠牌和型式的伺服馬達，材質採用鋁合金，表面經由防氧化處理，提高環境的耐受性和抗腐蝕能力。

Modular Design of Motor Connection Plate

The special modular design of motor connection plate is suitable for any brand and any type of servomotor. It is made by aluminum alloy. Its surface is anti-oxidant treated for upgrading environmental-resistant and corrosion-resistant capability.

Indication of Model Numbers

機種型號表示

SB	90	10			P1	MOTOR
減速機型 Type	型號 Model	速比 Ratio	出力軸鍵槽 Output Shaft	入力軸鍵槽 Input Shaft	背隙等級 Backlash Class	馬達型號 Motor Type
SB	44	單段 1-Stage	□標準品，有鍵槽 Standard (Keyway)	□無鍵槽 No Keyway	Ps	
SE	62	3, 4, 5, 6, 7, 8, 9, 10		K: 有鍵槽 Keyway	P0	
SB-A	90		N: 實心軸，無鍵槽 Solid Output Shaft (No Keyway)		P1	
SE-A	120	雙段 2-Stage		(142#~330#)	P2	
SBL	142	15 ~ 100				
SEL	180					
SBL-A	220	三段 3-Stage				
SEL-A	270	125 ~ 1000				
SBT	330					
		SBT 單段 1-Stage 3 ~ 50				

SB



SB-A



SBL



SBL-A



SBT



SE



SE



SE-A



SEL



SEL-A



Description of Standard and A-Type

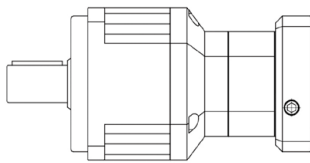
標準型及 A-Type 說明

在 2 段或 3 段減速時，減速比高，輸出扭矩大，標準型的 2 段或 3 段齒箱為大齒箱接小齒箱，可限制入力馬力，以符合額定輸出扭矩。

A-Type 為二個相同框號齒箱的連結。

The features of 2-stage or 3-stage gearbox are high gear ratio and large output torque. The standard type of 2-stage or 3-stage gearbox are combined by big and small gearboxes to have a limit to input power and then to meet rated output torque. A-Type has a combination of 2 gearboxes with same frame.

Standard



例如：

使用伺服馬達，功率 0.5kW，額定輸出扭矩 2.39Nm，馬達軸心為 Ø24mm

1. 假設減速比為 1/50 時：

輸出扭矩為 $2.39\text{Nm} \times 50 \times 94\%$ (效率) = 112Nm

(1) 可選擇 SB-120-50

額定輸出扭矩 333Nm S.F.=2.97(安全系數)

(2) 亦可選擇 SB-90A-50

額定輸出扭矩 160Nm S.F.=1.42(降框號使用)

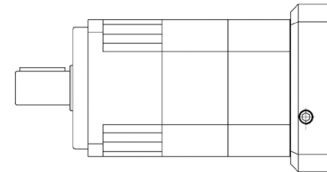
2. 假設減速比為 1/100 時：

輸出扭矩為 $2.39 \times 100 \times 94\%$ (效率) = 224Nm

可選用 SB-120-100 S.F.=1.3

選用 SB-90A-100 時 S.F.=0.62 安全系數不足，不建議使用

A-Type



Example:

Servo motor 0.5 kW, rated output torque 2.39 Nm, motor shaft Ø24 mm.

1. Suppose the speed reduction ratio is 1/50:

Output torque is $2.39 \text{ Nm} \times 50 \times 94\%$ (efficiency) = 112 Nm.

(1) You can select SB-120-50 with rated output torque of 333 Nm and S.F. = 2.97

(2) You can select SB-90A-50 with rated output torque of 160 Nm and S.F. = 1.42

2. Suppose the speed reduction ratio is 1/100:

Output torque is $2.39 \times 100 \times 94\%$ (efficiency) = 224 Nm.

You can select SB-120-100 and S.F. = 1.3. You are not suggested to choose SB-90A-100 because of low S.F. = 0.62.

Description Right Angle of L-Type and T-Type

直交軸 L-Type / T-Type 說明

SBL：螺旋傘齒輪段減速比 1:1、1:2

優點：總長度較短

缺點：減速比較少

SBT：螺旋傘齒輪段減速比 1:1、1:2、1:3、1:4、1:5

優點：減速比較多

缺點：總長度較長

SBL: Spiral Bevel Gear Ratio 1:1, 1:2

Pros: Shorter overall length.

Cons: Ratio less.

SBT: Spiral Bevel Gear Ratio 1:1, 1:2, 1:3, 1:4, 1:5

Pros: Ratio more.

Cons: Overall length is longer.

L-Type



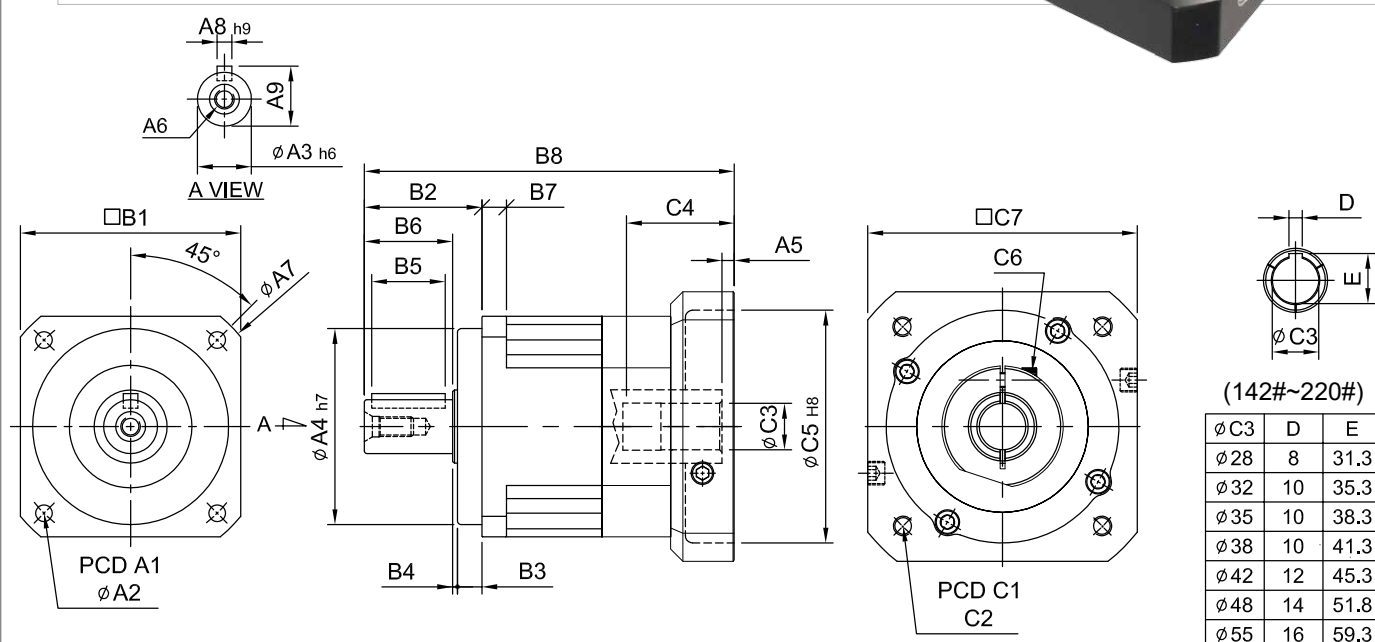
T-Type



MODEL : SB

單段 1-Stage

RATIO : 3, 4, 5, 6, 7, 8, 9, 10



unit: mm

	Model Code							
		44	62	90	120	142	180	220
A	A1	50	70	100	130	165	215	250
	A2	4.5	5.5	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	5	6	9 · 23.5	10 · 20	10	11.5 · 14.5	12.5 · 14.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	58	80	116	148	186	238	288
	A8	5	5	6	10	12	16	20
	A9	15	18	24.5	35	43	59	79.5
B	B1	44	62	90	120	142	180	220
	B2	26	36	48	65	92	106	139
	B3	5	7	10	12	15	20	30
	B4	1	1	2	3	3	4	5
	B5	15	20	30	40	65	70	90
	B6	20	28	36	50	74	82	104
	B7	5	8	10	12	15	16	20
	B8	95	115 · 123	164.5 · 179	205 · 215	260.5	323.5 · 325.5	367.5
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265 · 300	200 · 265 · 300
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
	C3	8 · 9 · 11	11 · 14 · 16 · 19	16 · 19 · 22 · 24	22 · 24 · 28 · 32	28 · 32 · 35 · 38	35 · 38 · 42 · 48 · 55	38 · 42 · 48 · 55
	C4	26 · 30.5	33.5 · 41.5	59 · 73.5	67 · 77	84.5	114.5 · 117.5	117.5 · 119.5
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230 · 250	114.3 · 230 · 250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250 · 265	222 · 250 · 265

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	44	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	19	59	165	335	625	1,206	2,030
			4	16	51	146	300	555	1,069	1,804
			5	16	48	160	333	618	1,189	2,010
			6	15	45	151	311	583	1,118	1,911
			7	15	45	149	309	573	1,108	1,870
			8	14	43	143	298	553	1,070	1,824
			9	13	44	145	278	516	993	1,694
			10	14	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 10	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 10	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 10	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	3 ~ 10	-	-	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
背隙 Backlash P0		arcmin	3 ~ 10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P1		arcmin	3 ~ 10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P2		arcmin	3 ~ 10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 10	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 10	380	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 10	190	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	3 ~ 10	S5 周期運轉: >30,000 (S1 連續運轉: >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	3 ~ 10	≥ 97%						
使用溫度 Operating Temperature		°C	3 ~ 10	- 25° C ~ + 90° C						
潤滑 Lubrication			3 ~ 10	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			3 ~ 10	IP65						
安裝方向 Mounting Position			3 ~ 10	任意方向 Any						
噪音值 Noise Level		dB	3 ~ 10	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	3 ~ 10	0.6	1.28	3.6	8	14.3	28.3	42.5

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

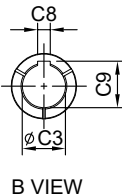
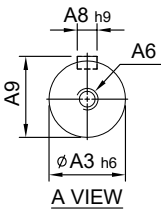
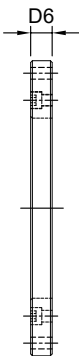
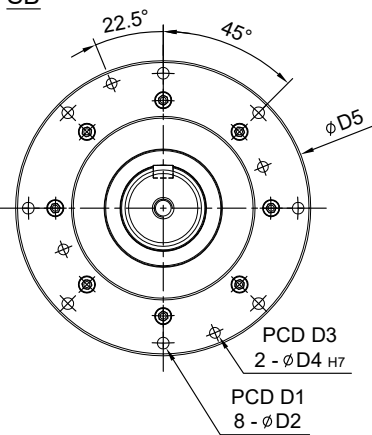
Ratio	44	62	90	120	142	180	220
3	0.03	0.16	0.61	3.25	9.21	28.98	59.61
4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
8	0.03	0.13	0.44	2.58	7.07	22.59	50.84
9	0.03	0.13	0.44	2.57	7.04	22.53	50.63
10	0.03	0.13	0.44	2.57	7.03	22.51	50.56

MODEL : SB SE

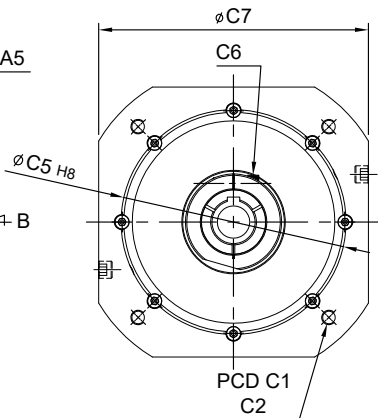
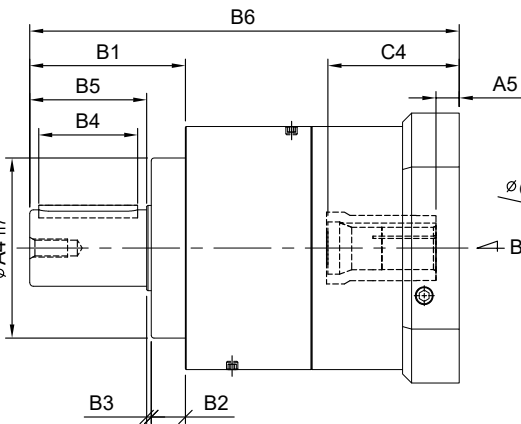
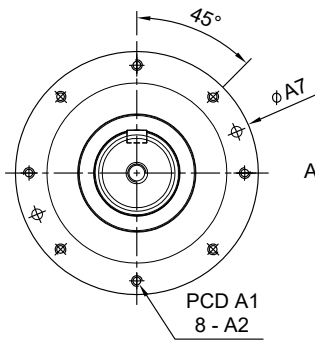
單段 1-Stage
RATIO : 3, 4, 5, 7, 10



SB



SE

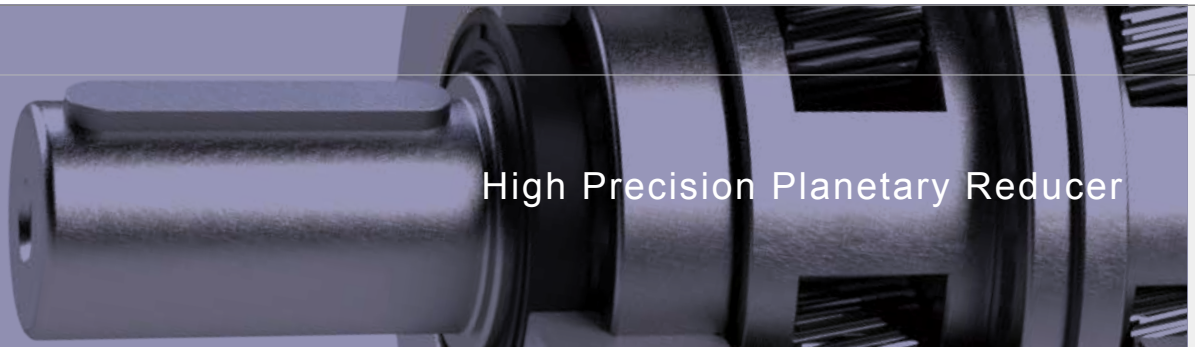


unit: mm

	Model	270	330
	Code		
A	A1	240	300
	A2	M12 x P1.75	M16 x P2.0
	A3	85	100
	A4	200	250
	A5	23・26	23・26
	A6	M20 x P2.5	M24 x P3.0
	A7	270	336
	A8	22	28
	A9	90	106
B	B1	173	187
	B2	38	42
	B3	5	5
	B4	110	120
	B5	130	140
	B6	474.5・477.5	512・515

unit: mm

	Model	270	330
	Code		
C	C1	265・300・350	265・300・350
	C2	M12・M16・M18	M12・M16・M18
	C3	48・55・60・65	55・60・65・75
	C4	143・146	143・146
	C5	230・250・300	230・250・300
	C6	M12 x P1.75	M12 x P1.75
	C7	280・300・330	280・300・330
	C8	14・16・18・20	16・18・20
	C9	51.8・59.3・64.4・74.8	59.3・64.4・69.4・80
D	D1	300	380
	D2	13	17
	D3	300	380
	D4	12	14
	D5	328	416
	D6	24	28



規格 Parameter	代號	單位 Unit	速比 Ratio	270	330
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	4,770	8,790
			4	4,730	8,730
			5	4,680	8,660
			7	4,570	8,520
			10	4,420	8,310
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 10	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque	
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque	
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 10	2,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 10	3,000	3,000
背隙 Backlash Ps		arcmin	3 ~ 10	≤ 1	≤ 1
背隙 Backlash P0		arcmin	3 ~ 10	≤ 3	≤ 3
背隙 Backlash P1		arcmin	3 ~ 10	≤ 5	≤ 5
背隙 Backlash P2		arcmin	3 ~ 10	≤ 7	≤ 7
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 10	510	980
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 10	107,100	224,910
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 10	53,550	112,455
使用壽命 Service Life	L_H	hr	3 ~ 10	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)	
效率 Efficiency	η	%	3 ~ 10	$\geq 97\%$	
使用溫度 Operating Temperature		°C	3 ~ 10	- 25° C ~ + 90° C	
潤滑 Lubrication			3 ~ 10	全合成潤滑油脂 Synthetic Grease	
防護等級 Protection Class			3 ~ 10	IP65	
安裝方向 Mounting Position			3 ~ 10	任意方向 Any	
噪音值 Noise Level		dB	3 ~ 10	≤ 72	≤ 74
重量 Weight $\pm 3\%$		Kg	3 ~ 10	SB : 97 · SE : 87.5	SB : 190 · SE : 172

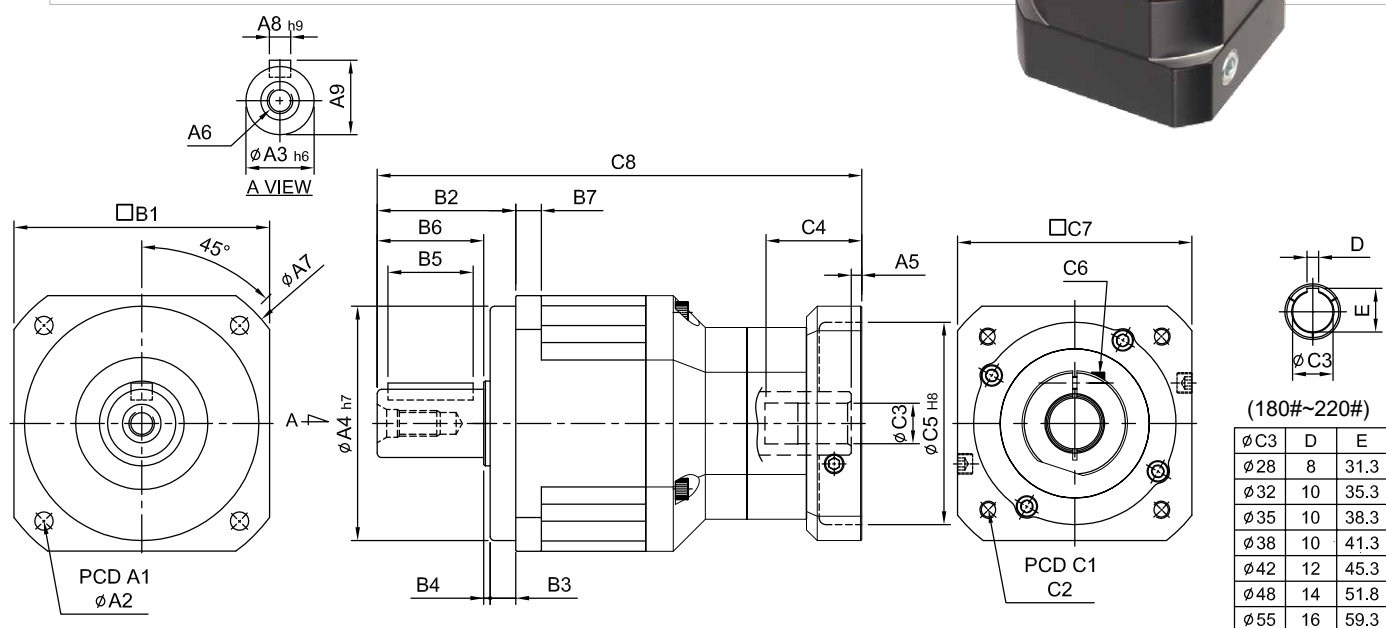
■ 轉動慣量 (kg.cm²) Mass Moments of Inertia

Ratio	270	330
3	122.20	252.96
4	111.46	230.72
5	109.20	226.05
7	104.49	216.29
10	103.65	214.55

MODEL : SB

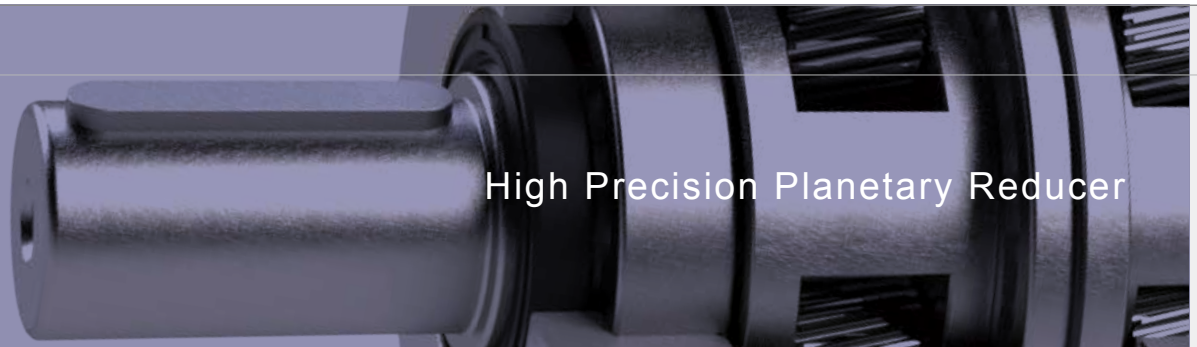
雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100



unit: mm

	Model Code	62	90	120	142	180	220
A	A1	70	100	130	165	215	250
	A2	5.5	6.8	9	11	13	17
	A3	16	22	32	40	55	75
	A4	50	80	110	130	160	180
	A5	5	6	9·23.5	10·20	10	11.5·13.5
	A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	80	116	148	186	238	288
	A8	5	6	10	12	16	20
	A9	18	24.5	35	43	59	79.5
B	B1	62	90	120	142	180	220
	B2	36	48	65	92	106	139
	B3	7	10	12	15	20	30
	B4	1	2	3	3	4	5
	B5	20	30	40	65	70	90
	B6	28	36	50	74	82	104
	B7	8	10	12	15	16	20
C	C1	46·60·63	70·75·90	90·100·115·145	115·145·165	145·165·215	200·215·265
	C2	M3·M4·M5	M4·M5·M6	M5·M6·M8·M10	M6·M8·M10	M8·M10·M12	M10·M12
	C3	8·9·11	11·14·16·19	16·19·22·24	22·24·28·32	28·32·35·38	35·38·42·48·55
	C4	26·30.5	33.5·41.5	59·73.5	67·77	84.5	114.5·116.5
	C5	30·40·50	50·60·70	70·80·95·110	70·95·110·130	110·130·180	114.3·180·230
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
	C7	46·55	64·70·80	92·110·130	122·130·150	146·180·190	182·200·250
	C8	139.5	172.5·180.5	241·255.5	298.5·308.5	358.5	446.5



High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	59	165	335	625	1,206	2,030
			20	51	146	300	555	1,069	1,804
			25	48	160	333	618	1,189	2,010
			30	45	151	311	583	1,118	1,911
			35	45	149	309	573	1,108	1,870
			40	43	143	298	553	1,070	1,824
			50	48	160	333	618	1,189	2,010
			60	45	151	311	583	1,118	1,911
			70	45	149	309	573	1,108	1,870
			80	43	143	298	553	1,070	1,824
			90	44	145	278	516	993	1,694
			100	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque					
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	6,000	6,000	6,000	5,000	5,000	4,000
背隙 Backlash Ps		arcmin	15 ~ 100	-	-	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P0		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P1		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P2		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	15 ~ 100	≥ 94%					
使用溫度 Operating Temperature		℃	15 ~ 100	- 25 °C ~ + 90 °C					
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			15 ~ 100	IP65					
安裝方向 Mounting Position			15 ~ 100	任意方向 Any					
噪音值 Noise Level		dB	15 ~ 100	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	15 ~ 100	1.73	4.6	9.42	17.2	34.1	57.3

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	62	90	120	142	180	220
15	0.03	0.14	0.46	2.63	7.3	22.79
20	0.03	0.14	0.46	2.63	7.3	22.79
25	0.03	0.14	0.46	2.63	7.1	22.79
30	0.03	0.14	0.46	2.43	7.1	22.59
35	0.03	0.14	0.44	2.43	7.1	22.59
40	0.03	0.14	0.44	2.43	6.92	22.59
50	0.03	0.14	0.44	2.43	6.92	22.59
60	0.03	0.14	0.43	2.39	6.72	21.83
70	0.03	0.14	0.43	2.39	6.72	21.83
80	0.03	0.14	0.43	2.39	6.72	21.83
90	0.03	0.14	0.40	2.39	6.72	21.60
100	0.03	0.14	0.40	2.39	6.72	21.60

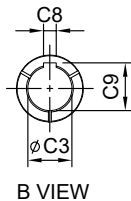
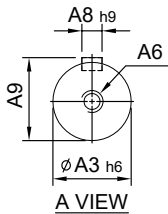
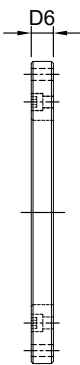
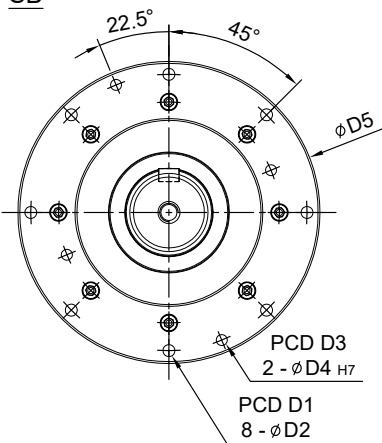
SERVOBX Planetary Reducers

MODEL : SB SE

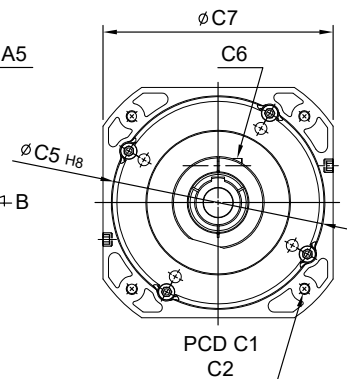
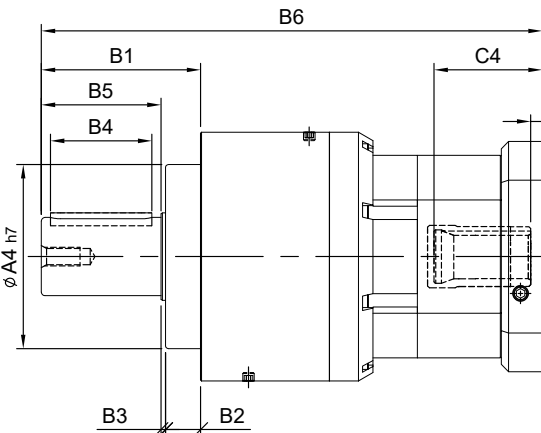
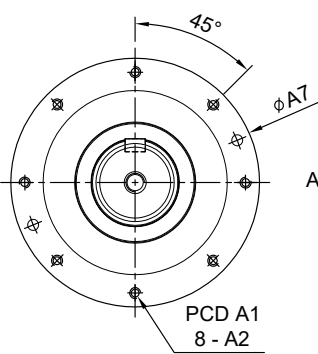
雙段 2-Stage
RATIO : 15, 20, 25, 30, 35,
40, 50, 70, 100



SB



SE

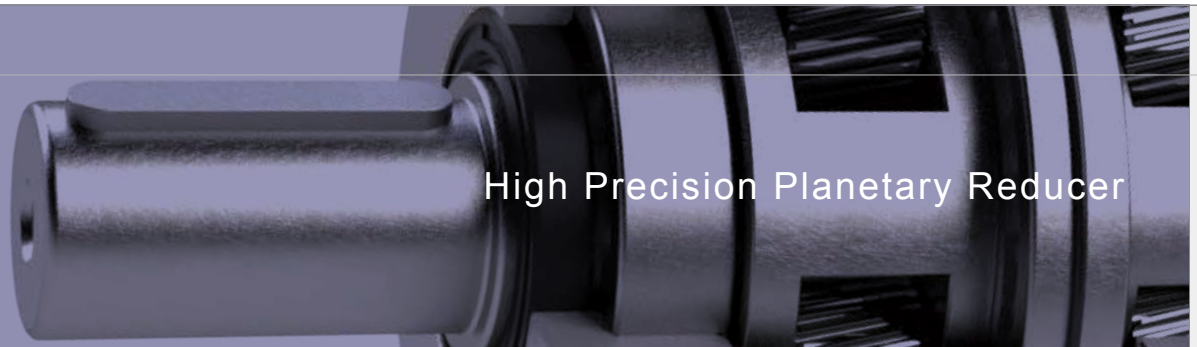


unit: mm

A	Model	270	330
	Code		
	A1	240	300
	A2	M12 x P1.75	M16 x P2.0
	A3	85	100
	A4	200	250
	A5	12.5	26 · 23
	A6	M20 x P2.5	M24 x P3.0
	A7	270	336
	A8	22	28
B	A9	90	106
	B1	173	187
	B2	38	42
	B3	5	5
	B4	110	120
	B5	130	140
	B6	544 · 547	625 · 632.5 · 635.5

unit: mm

C	Model	270	330
	Code		
	C1	200 · 265 · 300	265 · 300 · 350
	C2	M12 · M16	M12 · M16 · M18
	C3	38 · 42 · 48 · 55	48 · 55 · 60 · 65
	C4	117.5 · 120.5	146 · 149
	C5	114.3 · 230 · 250	230 · 250 · 300
	C6	M10 x P1.5	M12 x P1.75
	C7	222 · 250 · 265	280 · 300 · 330
	C8	10 · 12 · 14 · 16	14 · 16 · 18 · 20
D	C9	41.3 · 45.3 · 51.8 · 59.3	51.8 · 59.3 · 64.4 · 69.4 · 74.8
	D1	300	380
	D2	13	17
	D3	300	380
	D4	12	14
	D5	328	416
	D6	24	28



規格 Parameter	代號	單位 Unit	速比 Ratio	270	330
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	4,770	8,790
			20	4,730	8,730
			25	4,680	8,660
			30	4,770	8,610
			35	4,570	8,520
			40	4,730	8,440
			50	4,680	8,660
			70	4,570	8,520
			100	4,420	8,310
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque	
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque	
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	2,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	3,000	3,000
背隙 Backlash Ps		arcmin	15 ~ 100	≤ 3	≤ 3
背隙 Backlash P0		arcmin	15 ~ 100	≤ 5	≤ 5
背隙 Backlash P1		arcmin	15 ~ 100	≤ 7	≤ 7
背隙 Backlash P2		arcmin	15 ~ 100	≤ 9	≤ 9
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	510	980
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	107,100	224,910
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	53,550	112,455
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)	
效率 Efficiency	η	%	15 ~ 100	$\geq 94\%$	
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C	
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease	
防護等級 Protection Class			15 ~ 100	IP65	
安裝方向 Mounting Position			15 ~ 100	任意方向 Any	
噪音值 Noise Level		dB	15 ~ 100	≤ 72	≤ 74
重量 Weight $\pm 3\%$		Kg	15 ~ 100	SB : 137 · SE : 127.5	SB : 186 · SE : 176

■ 轉動慣量 (kg.cm²) Mass Moments of Inertia

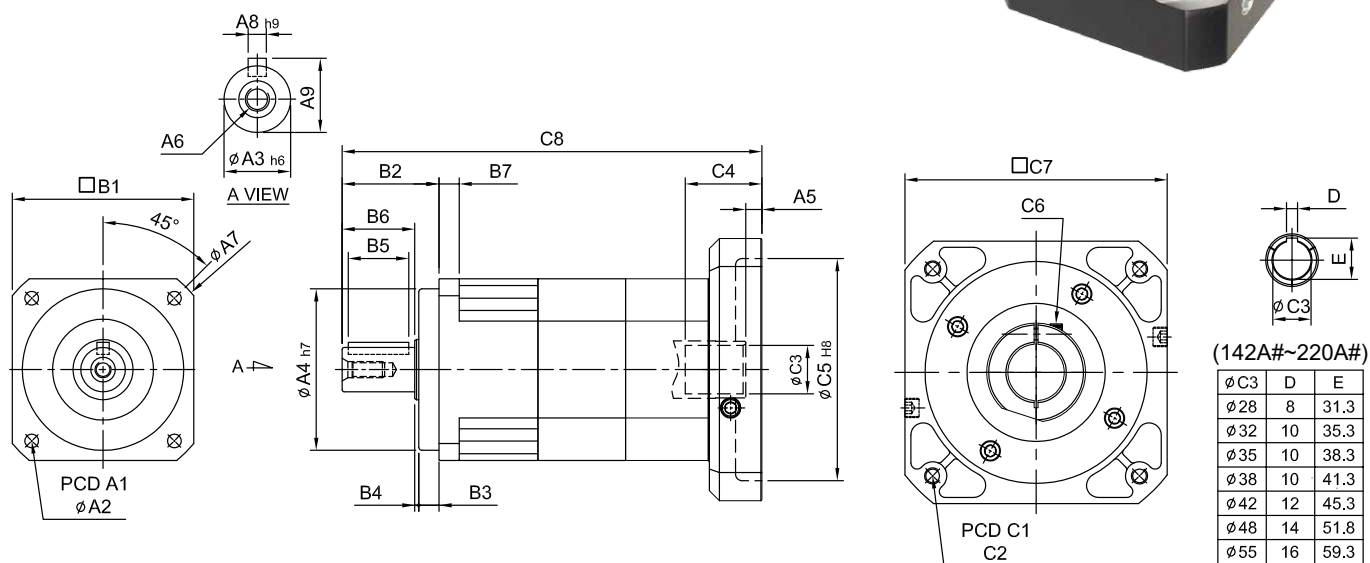
Ratio	270	330
15	63.81	185.05
20	63.81	185.05
25	63.81	185.05
30	63.25	183.43
35	63.25	183.43
40	63.25	183.43
50	63.25	183.43
70	61.12	177.26
100	60.48	175.39



MODEL : SB-A

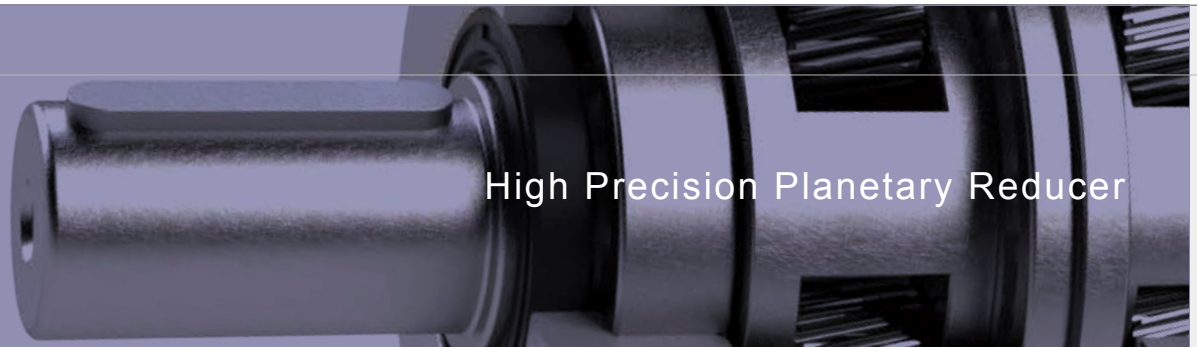
雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100



unit: mm

	Model	Unit: mm						
	Code	44A	62A	90A	120A	142A	180A	220A
A	A1	50	70	100	130	165	215	250
	A2	4.5	5.5	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	5	6	9、23.5	10、20	10	11.5、13.5	12.5、14.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	58	80	116	148	186	238	288
	A8	5	5	6	10	12	16	20
	A9	15	18	24.5	35	43	59	79.5
B	B1	44	62	90	120	142	180	220
	B2	26	36	48	65	92	106	139
	B3	5	7	10	12	15	20	30
	B4	1	1	2	3	3	4	5
	B5	15	20	30	40	65	70	90
	B6	20	28	36	50	74	82	104
	B7	5	8	10	12	15	16	20
C	C1	46、60、63	70、75、90	90、100、115、145	115、145、165	145、165、215	200、215、265	200、265、300
	C2	M3、M4、M5	M4、M5、M6	M5、M6、M8	M6、M8、M10	M8、M10、M12	M10、M12	M12、M16
	C3	8、9、11	11、14、16、19	16、19、22、24	22、24、28、32	28、32、35、38	35、38、42、48、55	38、42、48、55
	C4	26、30.5	33.5	59、73.5	67、77	84.5	114.5、116.5	117.5、119.5
	C5	30、40、50	50、60、70	70、80、95、110	95、110、130	110、130、180	114.3、180、230	114.3、230、250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.5	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46、55	64、70、80	92、110、130	122、130、150	146、150、190	182、200、250	222、250、265
	C8	121	148.8	208、222.5	261、271	327	404.5	460.5



規格 Parameter	代號	單位 Unit	速比 Ratio	44A	62A	90A	120A	142A	180A	220A
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	19	59	165	335	625	1,206	2,030
			20	16	51	146	300	555	1,069	1,804
			25	16	48	160	333	618	1,189	2,010
			30	15	45	151	311	583	1,118	1,911
			35	15	45	149	309	573	1,108	1,870
			40	14	43	143	298	553	1,070	1,824
			50	16	48	160	333	618	1,189	2,010
			60	15	45	151	311	583	1,118	1,911
			70	15	45	149	309	573	1,108	1,870
			80	14	43	143	298	553	1,070	1,824
			90	13	44	145	278	516	993	1,694
			100	14	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	15 ~ 100	-	-	-	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P0		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P1		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P2		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	380	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	190	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	15 ~ 100	$\geq 94\%$						
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C						
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			15 ~ 100	IP65						
安裝方向 Mounting Position			15 ~ 100	任意方向 Any						
噪音值 Noise Level		dB	15 ~ 100	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight $\pm 3\%$		Kg	15 ~ 100	0.6	2	5.5	11	21	42	59

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	44A	62A	90A	120A	142A	180A	220A
15	0.03	0.14	0.46	2.63	7.30	22.79	56.98
20	0.03	0.14	0.46	2.63	7.30	22.79	56.98
25	0.03	0.14	0.46	2.63	7.10	22.79	56.98
30	0.03	0.14	0.46	2.43	7.10	22.59	56.48
35	0.03	0.14	0.44	2.43	7.10	22.59	56.48
40	0.03	0.14	0.44	2.43	6.92	22.59	56.48
50	0.03	0.14	0.44	2.43	6.92	22.59	56.48
60	0.03	0.14	0.43	2.39	6.72	21.83	54.58
70	0.03	0.14	0.43	2.39	6.72	21.83	54.58
80	0.03	0.14	0.43	2.39	6.72	21.83	54.58
90	0.03	0.14	0.40	2.39	6.72	21.60	54.00
100	0.03	0.14	0.43	2.39	6.72	21.83	54.58

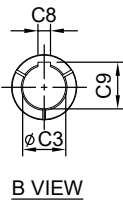
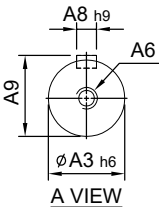
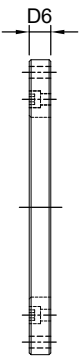
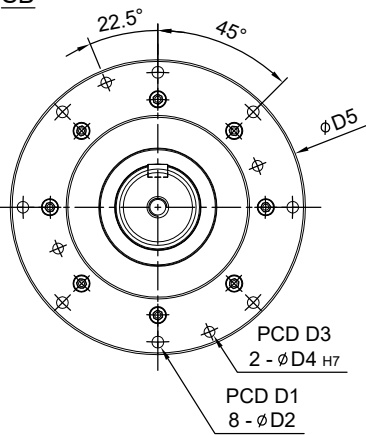
SERVOBOX Planetary Reducers

MODEL:SB-A SE-A

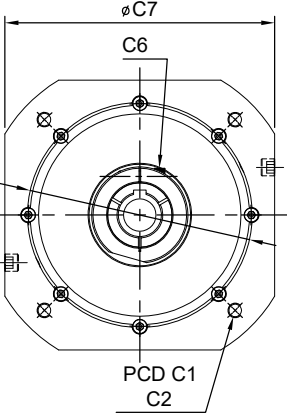
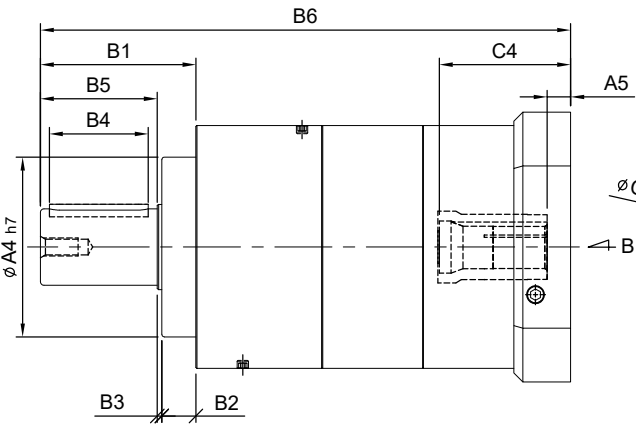
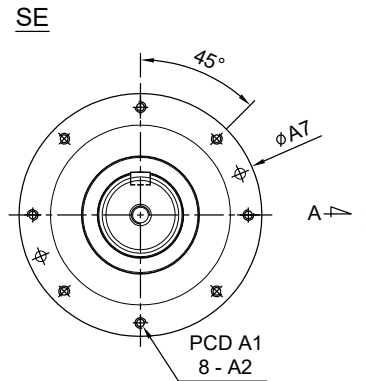
雙段 2-Stage
RATIO : 15, 20, 25, 30, 35,
40, 50, 70, 100



SB

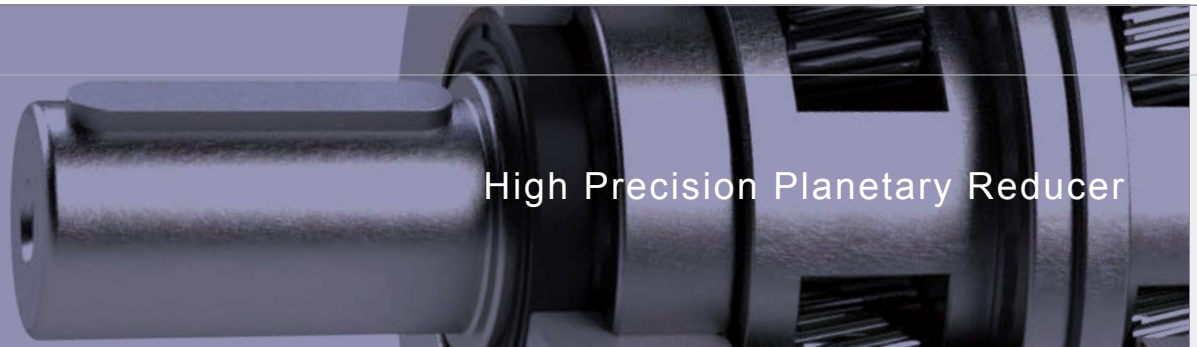


SE



unit: mm		
A	Model	270A
	Code	
	A1	240
	A2	M12 x P1.75
	A3	85
	A4	200
	A5	26 · 23
	A6	M20 x P2.5
	A7	270
B	A8	22
	A9	90
	B1	173
	B2	38
	B3	5
	B4	110
	B5	130
	B6	586.5 · 589.5

unit: mm		
C	Model	270A
	Code	
	C1	265 · 300 · 350
	C2	M12 · M16 · M18
	C3	48 · 55 · 60
	C4	143 · 146 · 149
	C5	230 · 250 · 300
	C6	M12 x P1.75
	C7	280 · 300 · 330
D	C8	14 · 16 · 18
	C9	51.8 · 59.3 · 64.4
	D1	300
	D2	13
	D3	300
	D4	12
	D5	328
	D6	24



High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	270A
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	4,770
			20	4,730
			25	4,680
			30	4,770
			35	4,570
			40	4,730
			50	4,680
			70	4,570
			100	4,420
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	3,000
背隙 Backlash Ps		arcmin	15 ~ 100	≤ 3
背隙 Backlash P0		arcmin	15 ~ 100	≤ 5
背隙 Backlash P1		arcmin	15 ~ 100	≤ 7
背隙 Backlash P2		arcmin	15 ~ 100	≤ 9
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	510
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	107,100
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	53,550
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)
效率 Efficiency	η	%	15 ~ 100	$\geq 94\%$
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease
防護等級 Protection Class			15 ~ 100	IP65
安裝方向 Mounting Position			15 ~ 100	任意方向 Any
噪音值 Noise Level		dB	15 ~ 100	≤ 72
重量 Weight $\pm 3\%$		Kg	15 ~ 100	SB : 146 · SE : 136.5

■ 轉動慣量 (kg.cm²) Mass Moments of Inertia

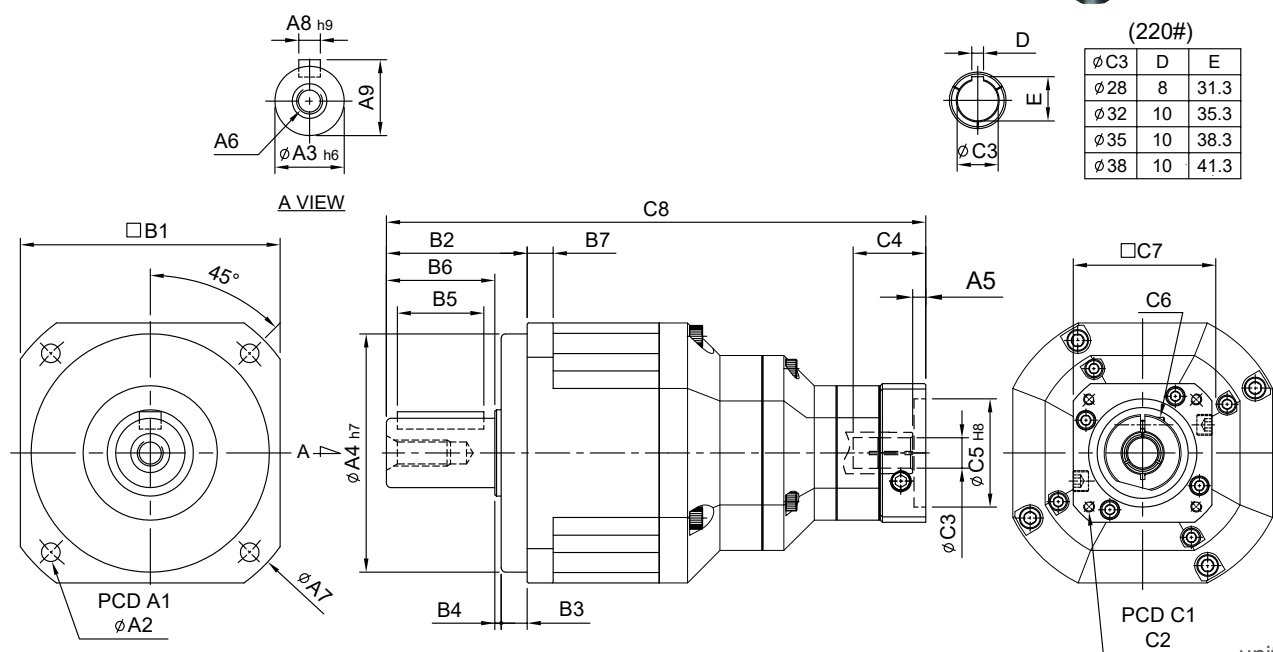
Ratio	270A
15	65.74
20	65.74
25	65.74
30	64.86
35	64.86
40	64.86
50	64.86
70	62.62
100	61.17



MODEL : SB

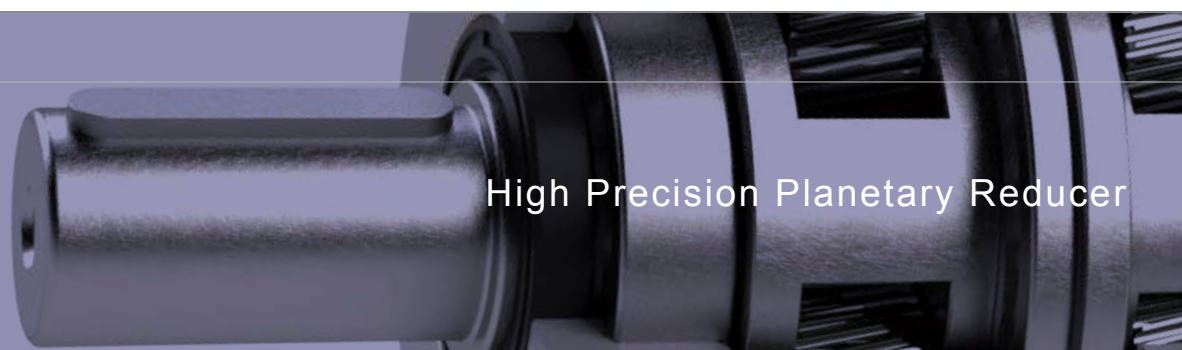
三段 3-Stage

RATIO : 125, 150, 175, 200, 250, 300, 350,
400, 450, 500, 600, 700, 800, 900, 1000



unit: mm

	Model	Unit Price				
	Code	90	120	142	180	220
A	A1	100	130	165	215	250
	A2	6.8	9	11	13	17
	A3	22	32	40	55	75
	A4	80	110	130	160	180
	A5	5	6	9・23.5	10・20	10
	A6	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	116	148	186	238	288
	A8	6	10	12	16	20
	A9	24.5	35	43	59	79.5
B	B1	90	120	142	180	220
	B2	48	65	92	106	139
	B3	10	12	15	20	30
	B4	2	3	3	4	5
	B5	30	40	65	70	90
	B6	36	50	74	82	104
	B7	10	12	15	16	20
C	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・215
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12
	C3	8・9・11	11・14・16・19	16・19・22・24	22・24・28・32	28・32・35・38
	C4	26・30.5	33.5・41.5	59・73.5	67・77	84.5
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	110・130・180
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190
	C8	197	249・257	334.5・349	396.5・406.5	481.5



High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	125	160	333	618	1,189	2,010
			150	165	335	583	1,206	2,030
			175	149	309	573	1,108	1,870
			200	146	300	555	1,069	1,804
			250	160	333	618	1,189	2,010
			300	151	311	583	1,118	1,911
			350	149	309	573	1,108	1,870
			400	143	298	553	1,070	1,824
			450	145	278	516	993	1,694
			500	160	333	618	1,189	2,010
			600	151	311	583	1,118	1,911
			700	149	309	573	1,108	1,870
			800	143	298	553	1,070	1,824
			900	145	278	516	993	1,694
			1000	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	125 ~ 1000	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque				
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	125 ~ 1000	3 倍額定輸出力矩 3 Times of Rated Output Torque				
急停扭矩 Emergency Stop Torque								
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	125 ~ 1000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	125 ~ 1000	6,000	6,000	6,000	5,000	5,000
背隙 Backlash Ps		arcmin	125 ~ 1000	-	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P0		arcmin	125 ~ 1000	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P1		arcmin	125 ~ 1000	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
背隙 Backlash P2		arcmin	125 ~ 1000	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11
扭轉剛性 Torsional Rigidity		Nm/arcmin	125 ~ 1000	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	125 ~ 1000	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	125 ~ 1000	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	125 ~ 1000	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
效率 Efficiency	η	%	125 ~ 1000	≥ 90%				
使用溫度 Operating Temperature		°C	125 ~ 1000	- 25° C ~ + 90° C				
潤滑 Lubrication			125 ~ 1000	全合成潤滑油脂 Synthetic Grease				
防護等級 Protection Class			125 ~ 1000	IP65				
安裝方向 Mounting Position			125 ~ 1000	任意方向 Any				
噪音值 Noise Level		dB	125 ~ 1000	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	125 ~ 1000	5.2	10	18.1	35	63.7

 ■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

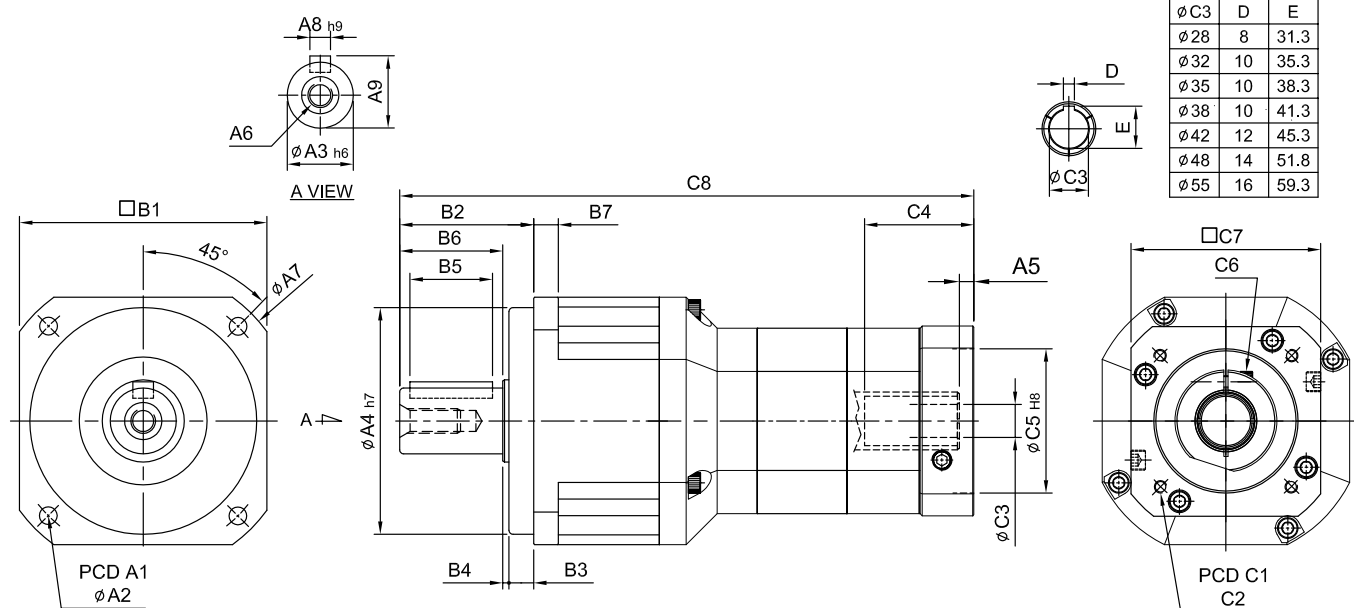
Ratio	90	120	142	180	220
125	0.01	0.04	0.71	1.42	3.29
150	0.01	0.04	0.51	0.92	2.15
175	0.01	0.04	0.40	0.83	1.26
200	0.01	0.04	0.21	0.65	0.98
250	0.01	0.04	0.11	0.52	0.82
300	0.01	0.04	0.09	0.21	0.82
350	0.01	0.04	0.09	0.21	0.82
400	0.01	0.04	0.09	0.21	0.82
450	0.01	0.04	0.09	0.21	0.51
500	0.01	0.04	0.08	0.12	0.51
600	0.01	0.04	0.08	0.12	0.25
700	0.01	0.04	0.08	0.12	0.25
800	0.01	0.04	0.08	0.12	0.25
900	0.01	0.04	0.08	0.12	0.25
1000	0.01	0.04	0.08	0.12	0.25



MODEL : SB-A

三段 3-Stage

RATIO : 125, 150, 175, 200, 250, 300, 350,
400, 450, 500, 600, 700, 800, 900, 1000



unit: mm

	Model	62A	90A	120A	142A	180A	220A
	Code						
A	A1	70	100	130	165	215	250
	A2	5.5	6.8	9	11	13	17
	A3	16	22	32	40	55	75
	A4	50	80	110	130	160	180
	A5	5	6	9・23.5	10・20	10	11.5・13.5
	A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	80	116	148	186	238	288
	A8	5	6	10	12	16	20
	A9	18	24.5	35	43	59	79.5
B	B1	62	90	120	142	180	220
	B2	36	48	65	92	106	139
	B3	7	10	12	15	20	30
	B4	1	2	3	3	4	5
	B5	20	30	40	65	70	90
	B6	28	36	50	74	82	104
	B7	8	10	12	15	16	20
C	C1	46・63・60	70・75・90	90・100・115・145	115・145・165	145・165・215	200・215・265
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12	M10・M12
	C3	8・9・11	11・14・16・19	16・19・22・24	22・24・28・32	28・32・35・38	35・38・42・48・55
	C4	26・30.5	33.5・41.5	59・73.5	67・77	84.5	114.5・116.5
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	110・130・180	114.3・180・230
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190	182・200・250
	C8	165.5	206.3・214.3	284.5・299	354.5・364.5	425	527.5

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62A	90A	120A	142A	180A	220A
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	125	48	160	333	618	1,189	2,010
			150	59	165	335	583	1,206	2,030
			175	45	149	309	573	1,108	1,870
			200	51	146	300	555	1,069	1,804
			250	48	160	333	618	1,189	2,010
			300	45	151	311	583	1,118	1,911
			350	45	149	309	573	1,108	1,870
			400	43	143	298	553	1,070	1,824
			450	44	145	278	516	993	1,694
			500	48	160	333	618	1,189	2,010
			600	45	151	311	583	1,118	1,911
			700	45	149	309	573	1,108	1,870
			800	43	143	298	553	1,070	1,824
			900	44	145	278	516	993	1,694
			1000	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	125 ~ 1000	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	125 ~ 1000	3 倍額定輸出力矩 3 Times of Rated Output Torque					
急停扭矩 Emergency Stop Torque									
額定輸入轉速 Rated Input Speed	n_{IN}	rpm	125 ~ 1000	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{IB}	rpm	125 ~ 1000	6,000	6,000	6,000	5,000	5,000	4,000
背隙 Backlash Ps		arcmin	125 ~ 1000	-	-	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P0		arcmin	125 ~ 1000	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P1		arcmin	125 ~ 1000	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
背隙 Backlash P2		arcmin	125 ~ 1000	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11
扭轉剛性 Torsional Rigidity		Nm/arcmin	125 ~ 1000	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	125 ~ 1000	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	125 ~ 1000	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	125 ~ 1000	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	125 ~ 1000	≥ 90%					
使用溫度 Operating Temperature		°C	125 ~ 1000	- 25° C ~ + 90° C					
潤滑 Lubrication			125 ~ 1000	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			125 ~ 1000	IP65					
安裝方向 Mounting Position			125 ~ 1000	任意方向 Any					
噪音值 Noise Level		dB	125 ~ 1000	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	125 ~ 1000	4	6.5	13	30	57	87

轉動慣量 Mass Moments of Inertia (kg.cm²)

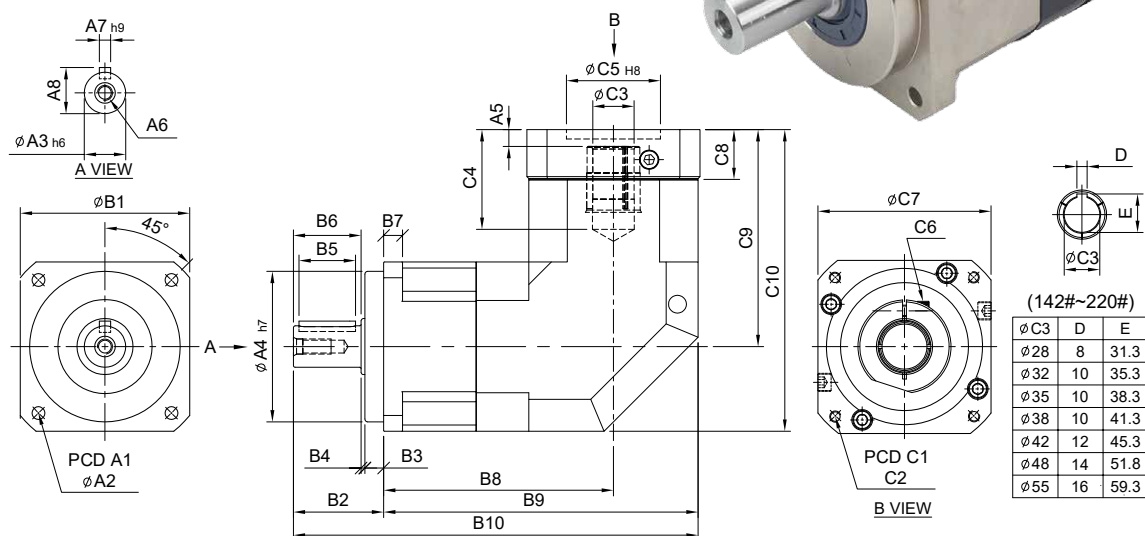
Ratio	62A	90A	120A	142A	180A	220A
125	0.01	0.01	0.04	0.71	1.42	3.29
150	0.01	0.01	0.04	0.51	0.92	2.15
175	0.01	0.01	0.04	0.40	0.83	1.26
200	0.01	0.01	0.04	0.21	0.65	0.98
250	0.01	0.01	0.04	0.11	0.52	0.82
300	0.01	0.01	0.04	0.09	0.21	0.82
350	0.01	0.01	0.04	0.09	0.21	0.82
400	0.01	0.01	0.04	0.09	0.21	0.82
450	0.01	0.01	0.04	0.09	0.21	0.51
500	0.01	0.01	0.04	0.08	0.12	0.51
600	0.01	0.01	0.04	0.08	0.12	0.25
700	0.01	0.01	0.04	0.08	0.12	0.25
800	0.01	0.01	0.04	0.08	0.12	0.25
900	0.01	0.01	0.04	0.08	0.12	0.25
1000	0.01	0.01	0.04	0.08	0.12	0.25

SERVOPBOX Planetary Reducers

MODEL : SBL

單段 1-Stage

RATIO : 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20



unit: mm

	Model Code							
		44	62	90	120	142	180	220
A	A1	50	70	100	130	165	215	250
	A2	4.5	5.5	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	6	6	9 · 23.5	10 · 20	10	12.5 · 14.5	12.5 · 14.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
	B1	44	62	90	120	142	180	220
	B2	26	36	48	65	92	106	139
B	B3	5	7	10	12	15	20	30
	B4	1	1	2	3	3	4	5
	B5	15	20	30	40	65	70	90
	B6	20	28	36	50	74	82	104
	B7	5	8	10	12	15	16	20
	B8	76	84.5	122.1	148	165.5	223.6	231.6
	B9	98	115.5	167.1	208	236.5	313.6	341.6
	B10	124	151.5	215	273	328.5	419.6	480.6
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265	200 · 265 · 300
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
	C3	8 · 11	11 · 14 · 16 · 19	16 · 19 · 22 · 24	24 · 28 · 32	28 · 32 · 35 · 38	35 · 38 · 42 · 48 · 55	38 · 42 · 48 · 55
	C4	27	27 · 31.5 · 41.5	54 · 68.5	67 · 77	84	114.5 · 116.5	114.5 · 116.5
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265
	C8	16	21.5	26.5 · 41	35.5 · 45.5	35.5	45.5 · 47.5	45.5 · 47.5
	C9	61	77 · 85	115.3 · 129.8	141 · 151	165.7	235 · 237	235 · 237
	C10	83	108 · 116	160.3 · 174.8	201 · 211	236.7	325 · 327	345 · 347

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	44	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	19	59	165	335	625	1,206	2,030
			4	16	51	146	300	555	1,069	1,804
			5	16	48	160	333	618	1,189	2,010
			6	15	45	151	311	583	1,118	1,911
			7	15	45	149	309	573	1,108	1,870
			8	14	43	143	298	553	1,070	1,824
			9	13	44	145	278	516	993	1,694
			10	14	43	141	294	549	1,059	1,779
			12	15	45	151	311	583	1,118	1,911
			14	15	45	149	309	573	1,108	1,870
			16	14	43	143	298	553	1,070	1,824
			18	13	44	145	278	516	993	1,694
			20	14	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 20	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 20	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 20	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 20	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	3 ~ 20	-	-	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2
背隙 Backlash P0		arcmin	3 ~ 20	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P1		arcmin	3 ~ 20	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
背隙 Backlash P2		arcmin	3 ~ 20	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 20	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 20	380	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 20	190	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	3 ~ 20	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	3 ~ 20	≥ 95%						
使用溫度 Operating Temperature		°C	3 ~ 20	- 25° C ~ + 90° C						
潤滑 Lubrication			3 ~ 20	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			3 ~ 20	IP65						
安裝方向 Mounting Position			3 ~ 20	任意方向 Any						
噪音值 Noise Level		dB	3 ~ 20	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	3 ~ 20	1	2.3	6.6	13.2	22.3	50	75.2

 ■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

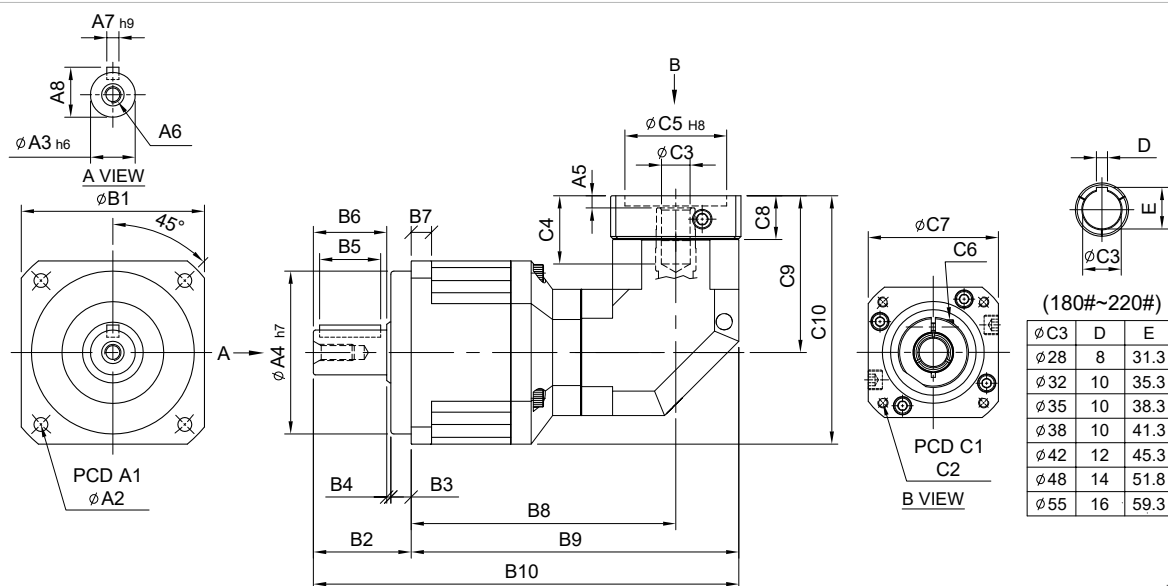
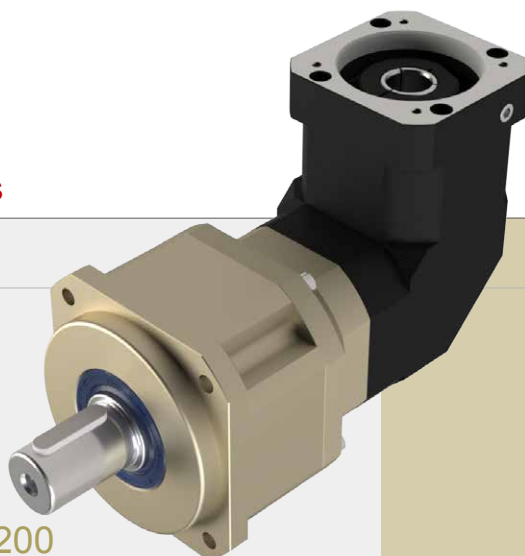
Ratio	44	62	90	120	142	180	220
3	0.09	0.36	2.28	6.85	23.5	68.2	135
4	0.09	0.36	2.28	6.85	23.5	68.2	135
5	0.09	0.36	2.28	6.85	23.5	68.2	135
6	0.09	0.36	2.28	6.85	23.5	68.2	135
7	0.09	0.36	2.28	6.85	23.5	68.2	135
8	0.09	0.36	2.28	6.85	23.5	68.2	135
9	0.09	0.36	2.28	6.85	23.5	68.2	135
10	0.09	0.36	2.28	6.85	23.5	68.2	135
12	0.03	0.08	1.88	6.2	21.8	65.5	119.2
14	0.03	0.08	1.88	6.2	21.8	65.5	119.2
16	0.03	0.08	1.88	6.2	21.8	65.5	119.2
18	0.03	0.08	1.88	6.2	21.8	65.5	119.2
20	0.03	0.08	1.88	6.2	21.8	65.5	119.2

SBL Planetary Reducers

MODEL : SBL

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70,
80, 90, 100, 120, 140, 160, 180, 200

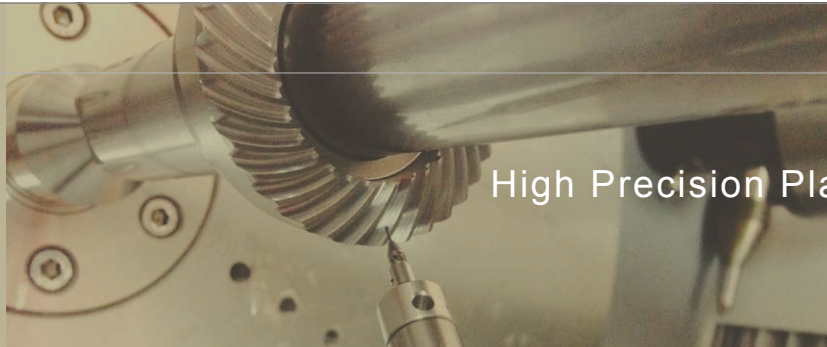


(180#~220#)

$\phi C3$	D	E
$\phi 28$	8	31.3
$\phi 32$	10	35.3
$\phi 35$	10	38.3
$\phi 38$	10	41.3
$\phi 42$	12	45.3
$\phi 48$	14	51.8
$\phi 55$	16	59.3

unit: mm

	Model Code	Model					
		62	90	120	142	180	220
A	A1	70	100	130	165	215	250
	A2	5.5	6.8	9	11	13	17
	A3	16	22	32	40	55	75
	A4	50	80	110	130	160	180
	A5	6	6	9 · 23.5	10 · 20	10	12.5 · 14.5
	A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	6	10	12	16	20
	A8	18	24.5	35	43	59	79.5
B	B1	62	90	120	142	180	220
	B2	36	48	65	92	106	139
	B3	7	10	12	15	20	30
	B4	1	2	3	3	4	5
	B5	20	30	40	65	70	90
	B6	28	36	50	74	82	104
	B7	8	10	12	15	16	20
	B8	110.5	130	181.6	214.5	249.5	313.6
	B9	132.5	161	266.6	274.5	320.5	403.6
	B10	168.5	209	291.6	366.5	426.5	542.6
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8 · M10	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16
	C3	8 · 11	11	14	16 · 19 · 22 · 24	24 · 28 · 32	28 · 32 · 35 · 38
	C4	27	27	31.5	41.5	54 · 68.5	67 · 77
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250
	C8	16	21.5	26.5 · 41	35.5 · 45.5	35.5	45.5 · 47.5
	C9	61	77 · 85	115.3 · 129.8	141 · 151	165.7	235 · 237
	C10	92	122 · 130	175.3 · 189.8	212 · 222	255.7	345 · 347



High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	59	165	335	625	1,206	2,030
			20	51	146	300	555	1,069	1,804
			25	48	160	333	618	1,189	2,010
			30	45	151	311	583	1,118	1,911
			35	45	149	309	573	1,108	1,870
			40	43	143	298	553	1,070	1,824
			50	48	160	333	618	1,189	2,010
			60	45	151	311	583	1,118	1,911
			70	45	149	309	573	1,108	1,870
			80	43	143	298	553	1,070	1,824
			90	44	145	278	516	993	1,694
			100	43	141	294	549	1,059	1,779
			120	45	151	311	583	1,118	1,911
			140	45	149	309	573	1,108	1,870
			160	43	143	298	553	1,070	1,824
			180	44	145	278	516	993	1,694
			200	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 200	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	15 ~ 200	3 倍額定輸出力矩 3 Times of Rated Output Torque					
急停扭矩 Emergency Stop Torque									
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 200	6,000	6,000	6,000	5,000	5,000	4,000
背隙 Backlash Ps		arcmin	15 ~ 200	-	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P0		arcmin	15 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P1		arcmin	15 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
背隙 Backlash P2		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 200	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 200	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 200	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	15 ~ 200	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	15 ~ 200	≥ 92%					
使用溫度 Operating Temperature		°C	15 ~ 200	- 25° C ~ + 90° C					
潤滑 Lubrication			15 ~ 200	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			15 ~ 200	IP65					
安裝方向 Mounting Position			15 ~ 200	任意方向 Any					
噪音值 Noise Level		dB	15 ~ 200	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	15 ~ 200	2	5.5	12.5	23.2	44.4	79.5

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

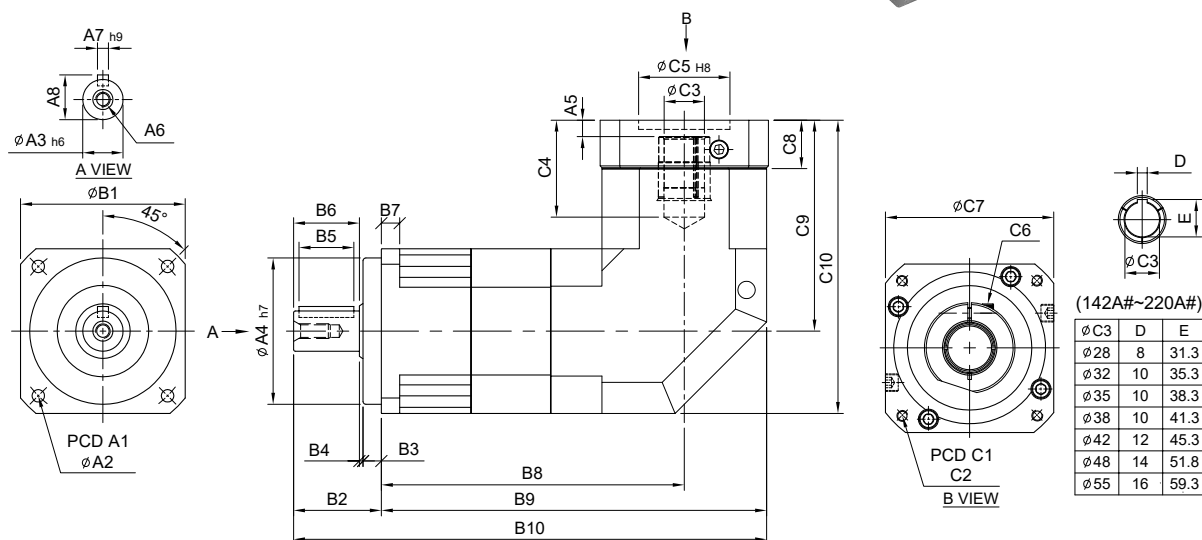
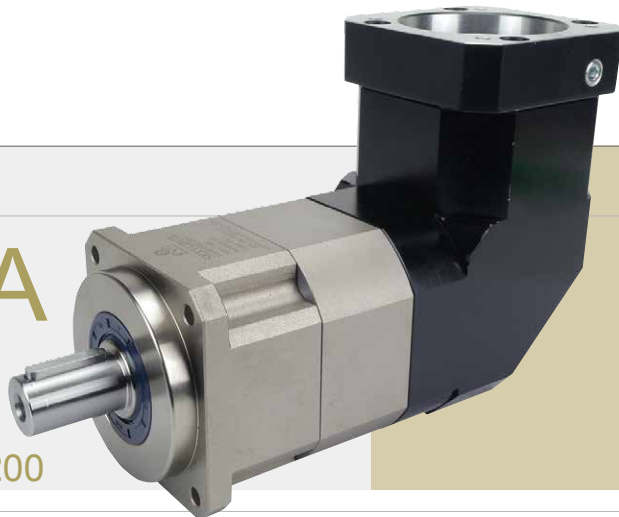
Ratio	62	90	120	142	180	220
15	0.09	0.36	2.28	6.85	26.2	70.1
20	0.09	0.36	2.28	6.85	26.2	70.1
25	0.09	0.36	2.28	6.85	23.1	68.2
30	0.09	0.36	2.28	6.85	23.1	68.2
35	0.09	0.36	2.28	6.85	23.1	68.2
40	0.09	0.36	2.28	6.85	23.1	68.2
50	0.09	0.36	2.28	6.85	23.1	68.2
60	0.09	0.36	2.28	6.85	23.1	68.2
70	0.09	0.36	2.28	6.85	23.1	68.2
80	0.09	0.36	2.28	6.85	23.1	68.2
90	0.09	0.36	2.28	6.85	23.1	68.2
100	0.09	0.36	2.28	6.85	23.1	68.2
120	0.03	0.10	1.88	6.20	21.2	65.1
140	0.03	0.10	1.88	6.20	21.2	65.1
160	0.03	0.10	1.88	6.20	21.2	65.1
180	0.03	0.10	1.88	6.20	21.2	65.1
200	0.03	0.10	1.88	6.20	21.2	65.1

SBL Planetary Reducers

MODEL : SBL-A

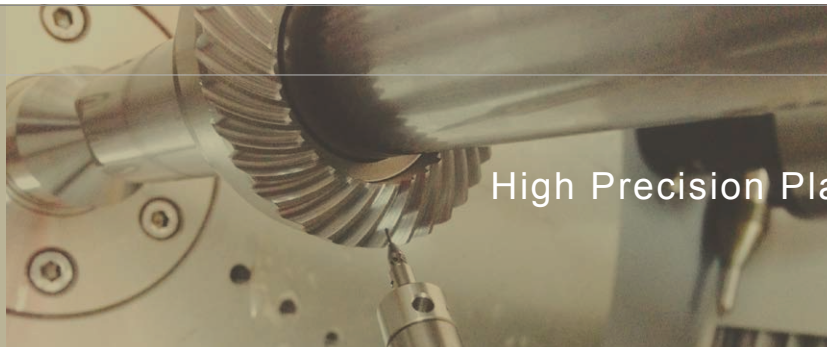
雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70,
80, 90, 100, 120, 140, 160, 180, 200



unit: mm

	Model Code	44A	62A			90A	120A	142A	180A	220A
A	A1	50	70			100	130	165	215	250
	A2	4.5	5.5			6.8	9	11	13	17
	A3	13	16			22	32	40	55	75
	A4	35	50			80	110	130	160	180
	A5	6	6			9、23.5	10、20	10	12.5、14.5	12.5、14.5
	A6	M4 x P0.7	M5 x P0.8			M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5			6	10	12	16	20
	A8	15	18			24.5	35	43	59	79.5
B	B1	44	62			90	120	142	180	220
	B2	26	36			48	65	92	106	139
	B3	5	7			10	12	15	20	30
	B4	1	1			2	3	3	4	5
	B5	15	20			30	40	65	70	90
	B6	20	28			36	50	74	82	104
	B7	5	8			10	12	15	16	20
	B8	102	118.3			165.6	204	232	304.6	324.6
	B9	124	149.3			210.6	264	303	394.6	434.6
	B10	150	185.3			258.6	329	395	500.6	573.6
C	C1	46、60、63	70、75、90			90、110、115、145	115、145、165	145、165、215	200、215、265	200、265、300
	C2	M3、M4、M5	M4、M5、M6			M5、M6、M8	M6、M8、M10	M8、M10、M12	M10、M12、M16	M12、M16
	C3	8、11	11	14	16、19	16、19、22、24	24、28、32	28、32、35、38	35、38、42、48、55	38、42、48、55
	C4	27	27	31.5	41.5	54、68.5	67、77	84	114.5、116.5	114.5、116.5
	C5	30、40、50	50、60、70			70、80、95、110	95、110、130	110、130、180	114.3、180、230	114.3、230、250
	C6	M4 x P0.7	M5 x P0.8			M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46、55	64、70、80			92、110、130	122、130、150	146、150、190	182、200、250	220、250、265
	C8	16	21.5			26.5、41	35.5、45.5	35.5	45.5、47.5	45.5、47.5
	C9	61	77			115.3、129.8	141、151	165.7	235、237	235、237
	C10	83	108			160.3、174.8	201、211	236.7	325、327	345、347



High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	44A	62A	90A	120A	142A	180A	220A
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	19	59	165	335	625	1,206	2,030
			20	16	51	146	300	555	1,069	1,804
			25	16	48	160	333	618	1,189	2,010
			30	15	45	151	311	583	1,118	1,911
			35	15	45	149	309	573	1,108	1,870
			40	14	43	143	298	553	1,070	1,824
			50	16	48	160	333	618	1,189	2,010
			60	15	45	151	311	583	1,118	1,911
			70	15	45	149	309	573	1,108	1,870
			80	14	43	143	298	553	1,070	1,824
			90	13	44	145	278	516	993	1,694
			100	14	43	141	294	549	1,059	1,779
			120	15	45	151	311	583	1,118	1,911
			140	15	45	149	309	573	1,108	1,870
			160	14	43	143	298	553	1,070	1,824
			180	13	44	145	278	516	993	1,694
			200	14	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 200	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	15 ~ 200	3 倍額定輸出力矩 3 Times of Rated Output Torque						
急停扭矩 Emergency Stop Torque										
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 200	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	15 ~ 200	-	-	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P0		arcmin	15 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P1		arcmin	15 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
背隙 Backlash P2		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 200	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 200	380	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 200	190	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_{H1}	hr	15 ~ 200	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation : >30,000 (S1 Continuous Operation : >15,000 hrs)						
效率 Efficiency	η	%	15 ~ 200	≥ 92%						
使用溫度 Operating Temperature		°C	15 ~ 200	- 25° C ~ + 90° C						
潤滑 Lubrication			15 ~ 200	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			15 ~ 200	IP65						
安裝方向 Mounting Position			15 ~ 200	任意方向 Any						
噪音值 Noise Level		dB	15 ~ 200	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	15 ~ 200	1.2	3	8.2	12.5	23.2	52.4	94.5

 ■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	44A	62A	90A	120A	142A	180A	220A
15	0.09	0.36	2.28	6.85	23.45	55.2	80.2
20	0.09	0.36	2.28	6.85	23.45	55.2	80.2
25	0.09	0.36	2.28	6.85	23.45	50.4	76.5
30	0.09	0.36	2.28	6.85	23.5	50.4	76.5
35	0.09	0.36	2.28	6.85	23.5	50.4	76.5
40	0.09	0.36	2.28	6.85	23.5	50.4	76.5
50	0.09	0.36	2.28	6.85	23.5	50.4	76.5
60	0.09	0.36	2.28	6.85	23.5	50.4	76.5
70	0.09	0.36	2.28	6.85	23.5	50.4	76.5
80	0.09	0.36	2.28	6.85	23.5	50.4	76.5
90	0.09	0.36	2.28	6.85	23.5	50.4	76.5
100	0.09	0.36	2.28	6.85	23.5	50.4	76.5
120	0.03	0.08	1.88	6.2	21.8	48.7	74.2
140	0.03	0.08	1.88	6.2	21.8	48.7	74.2
160	0.03	0.08	1.88	6.2	21.8	48.7	74.2
180	0.03	0.08	1.88	6.2	21.8	48.7	74.2
200	0.03	0.08	1.88	6.2	21.8	48.7	74.2

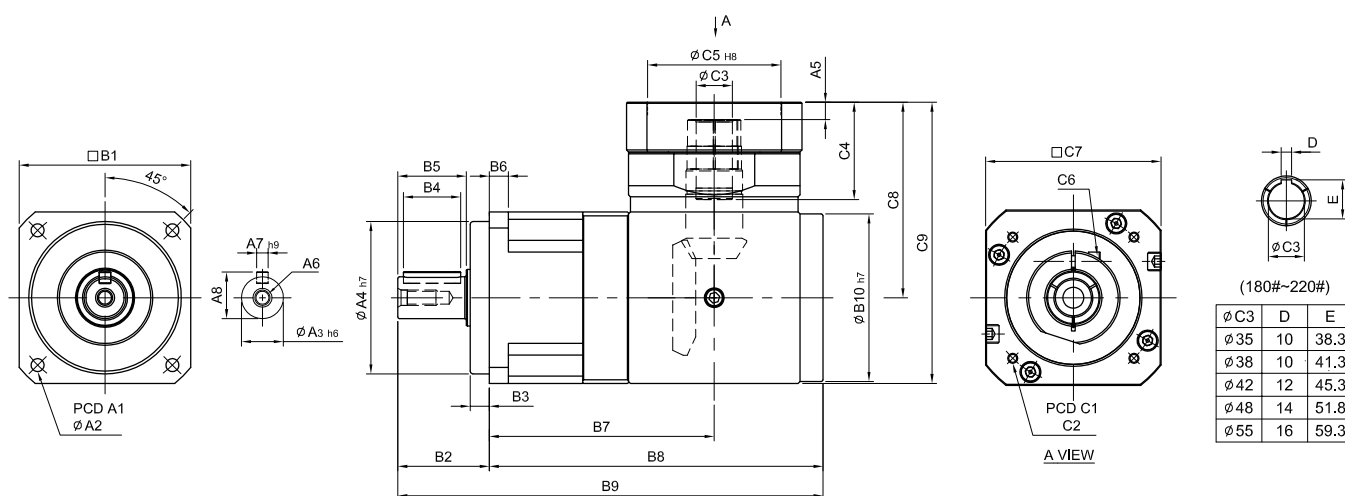
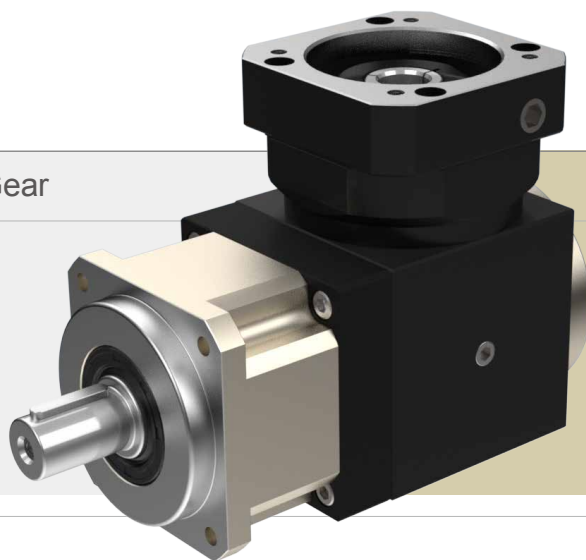
SERVOBOX Planetary Reducers

螺旋齒輪 Helical Gear & 螺旋傘齒輪 Spiral Bevel Gear

MODEL : SBT

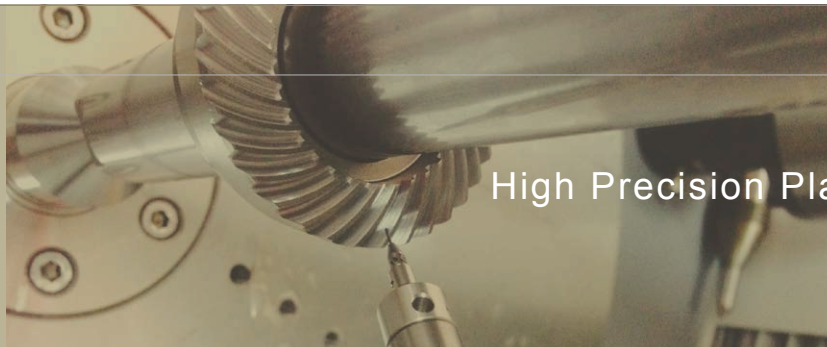
單段 1-Stage

RATIO : 3, 4, 5, 6, 7, 8, 9, 10, 15,
20, 25, 30, 35, 40, 45, 50



unit: mm

	Model	unit: mm						
	Code	44	62	90	120	142	180	220
A	A1	50	70	100	130	165	215	250
	A2	4.5	5.5	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	5	7	9・23.5	9・23.5	10	9.5	14・16
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16xP2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
B	B1	44	62	90	120	142	180	220
	B2	26	36	48	65	92	106	139
	B3	5	7	10	12	15	20	30
	B4	15	20	30	40	65	70	90
	B5	20	28	36	50	74	82	104
	B6	5	8	10	12	15	16	20
	B7	67.5	87.5	118	145	175	207	237
	B8	99.5	128	175	215	260	307	360
	B9	125.5	164	223	280	352	413	499
	B10	48	62	88	106	135	164	205
C	C1	46	70・75・90	90・100・115・145	90・100・115・145	115・145・165	145・165・215	200・215・265
	C2	M4	M4・M5・M6	M5・M6・M8	M5・M6・M8	M6・M8・M10	M8・M10・M12	M10・M12・M16
	C3	8	11・14	19・24	22・24	28・32・35	35・38	42・48・55
	C4	26	36	51・65.5	51・65.5	68	84.5	117・119
	C5	30	50・60・70	70・80・95・110	70・80・95・110	95・110・130	110・130・180	114.3・180・230
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10xP1.5
	C7	42	64・70・80	92・110・130	92・110・130	122・130・150	146・150・190	182・200・250
	C8	57	77	103・117	122・136	154	189	252・254
	C9	82	110	148・162	182・196	225	279	362・364



High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	44	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	19	59	165	335	625	1,206	2,030
			4	16	51	146	300	555	1,069	1,804
			5	16	48	160	333	618	1,189	2,010
			6	19	59	165	335	625	1,206	2,030
			7	15	45	149	309	573	1,108	1,870
			8	16	51	146	300	555	1,069	1,804
			9	19	59	165	335	625	1,206	2,030
			10	16	48	160	333	618	1,189	1,779
			15	16	48	160	333	618	1,189	2,030
			20	16	48	160	333	618	1,189	1,804
			25	16	48	160	333	618	1,189	2,010
			30	15	45	151	311	583	1,118	1,911
			35	15	45	149	309	573	1,108	1,870
			40	14	43	143	298	553	1,070	1,824
			45	13	44	145	278	516	993	1,694
			50	14	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 50	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	3 ~ 50	3 倍額定輸出力矩 3 Times of Rated Output Torque						
急停扭矩 Emergency Stop Torque										
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 50	3,000	3,000	3,000	2,500	2,500	2,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 50	6,000	6,000	5,500	4,500	3,500	3,000	3,000
背隙 Backlash Ps		arcmin	3 ~ 50	-	-	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2
背隙 Backlash P0		arcmin	3 ~ 50	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P1		arcmin	3 ~ 50	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
背隙 Backlash P2		arcmin	3 ~ 50	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 50	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 50	380	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 50	190	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	3 ~ 50	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	3 ~ 50	≥ 95%						
使用溫度 Operating Temperature		°C	3 ~ 50	-25°C ~ +90°C						
潤滑 Lubrication			3 ~ 50	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			3 ~ 50	IP65						
安裝方向 Mounting Position			3 ~ 50	任意方向 Any						
噪音值 Noise Level		dB	3 ~ 50	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 76
重量 Weight ±3%		Kg	3 ~ 50	1.2	2.2	7.1	13	24	48	78

行星減速機搭配傘齒輪減速機型號及速比一覽表 The Model & Ratio Table of Precision Planetary Reducer Assembly Bevel Gear Reducer

轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	44	62	90	120	142	180	220
3	0.09	0.36	2.28	6.85	23.5	68.2	135
4	0.09	0.36	2.28	6.85	23.5	68.2	135
5	0.09	0.36	2.28	6.85	23.5	68.2	135
6	0.09	0.36	2.28	6.85	23.5	68.2	135
7	0.09	0.36	2.28	6.85	23.5	68.2	135
8	0.09	0.36	2.28	6.85	23.5	68.2	135
9	0.09	0.36	2.28	6.85	23.5	68.2	135
10	0.09	0.36	2.28	6.85	23.5	68.2	135
15	0.06	0.22	2.05	6.21	21.2	61.3	135
20	0.06	0.22	2.05	6.21	21.2	61.3	135
25	0.06	0.22	2.05	6.21	21.2	61.3	135
30	0.06	0.22	2.05	6.21	21.2	61.3	135
35	0.06	0.22	2.05	6.21	21.2	61.3	135
40	0.06	0.22	2.05	6.21	21.2	61.3	135
45	0.06	0.22	2.05	6.21	21.2	61.3	135
50	0.06	0.22	2.05	6.21	21.2	61.3	135

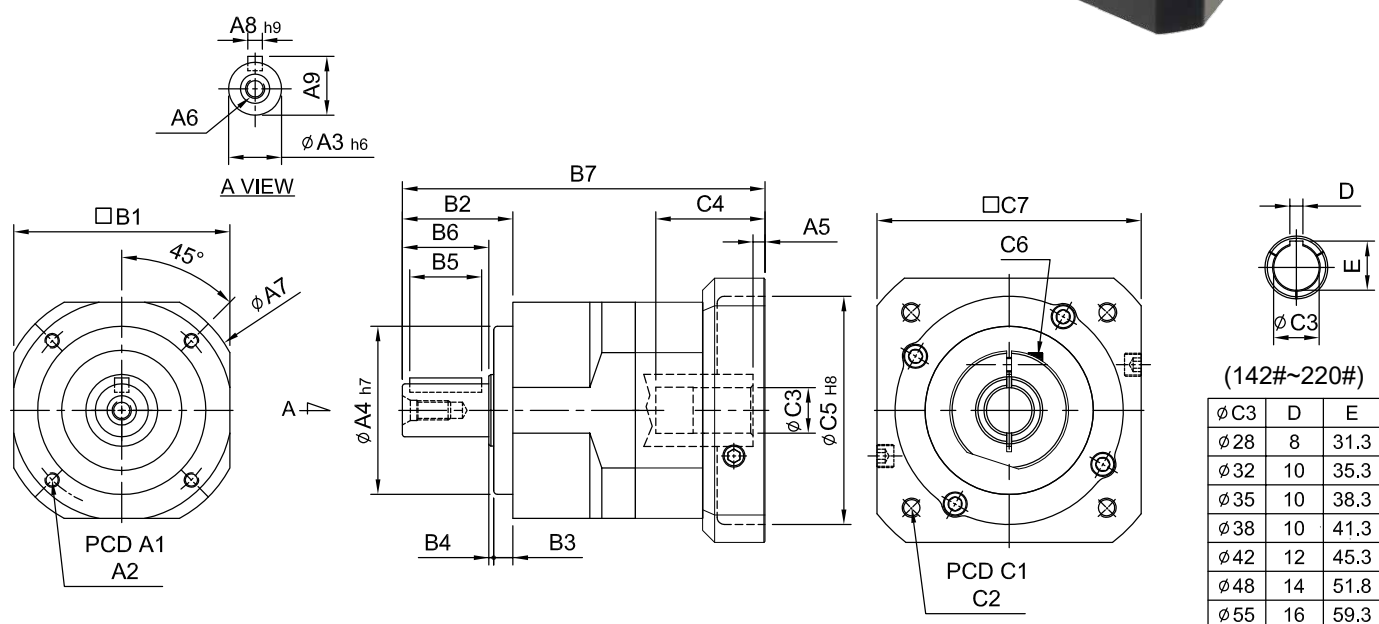
型號 Model	減速比 Ratio	法蘭盤框號 Flange Model	傘齒輪減速機 Bevel Gear Reducer Model
44	3、4、5、6、7 8、9、10、15、20 25、30、35、40 45、50	44	-
62		62	ST65
90		90	ST90
120		90	ST110
142		120	ST140
180		142	ST170
220		180	ST210

SERVOBOX Planetary Reducers

MODEL : SE

單段 1-Stage

RATIO : 3, 4, 5, 6, 7, 8, 9, 10



High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	44	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	19	59	165	335	625	1,206	2,030
			4	16	51	146	300	555	1,069	1,804
			5	16	48	160	333	618	1,189	2,010
			6	15	45	151	311	583	1,118	1,911
			7	15	45	149	309	573	1,108	1,870
			8	14	43	143	298	553	1,070	1,824
			9	13	44	145	278	516	993	1,694
			10	14	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 10	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{IN}	rpm	3 ~ 10	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{IB}	rpm	3 ~ 10	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	3 ~ 10	-	-	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
背隙 Backlash P0		arcmin	3 ~ 10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P1		arcmin	3 ~ 10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P2		arcmin	3 ~ 10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 10	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 10	380	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 10	190	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	3 ~ 10	S5 周期運轉: >30,000 (S1 連續運轉: >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	3 ~ 10	$\geq 97\%$						
使用溫度 Operating Temperature		°C	3 ~ 10	- 25° C ~ + 90° C						
潤滑 Lubrication			3 ~ 10	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			3 ~ 10	IP65						
安裝方向 Mounting Position			3 ~ 10	任意方向 Any						
噪音值 Noise Level		dB	3 ~ 10	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight $\pm 3\%$		Kg	3 ~ 10	0.58	1.32	3.4	7.88	14	29.16	39

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

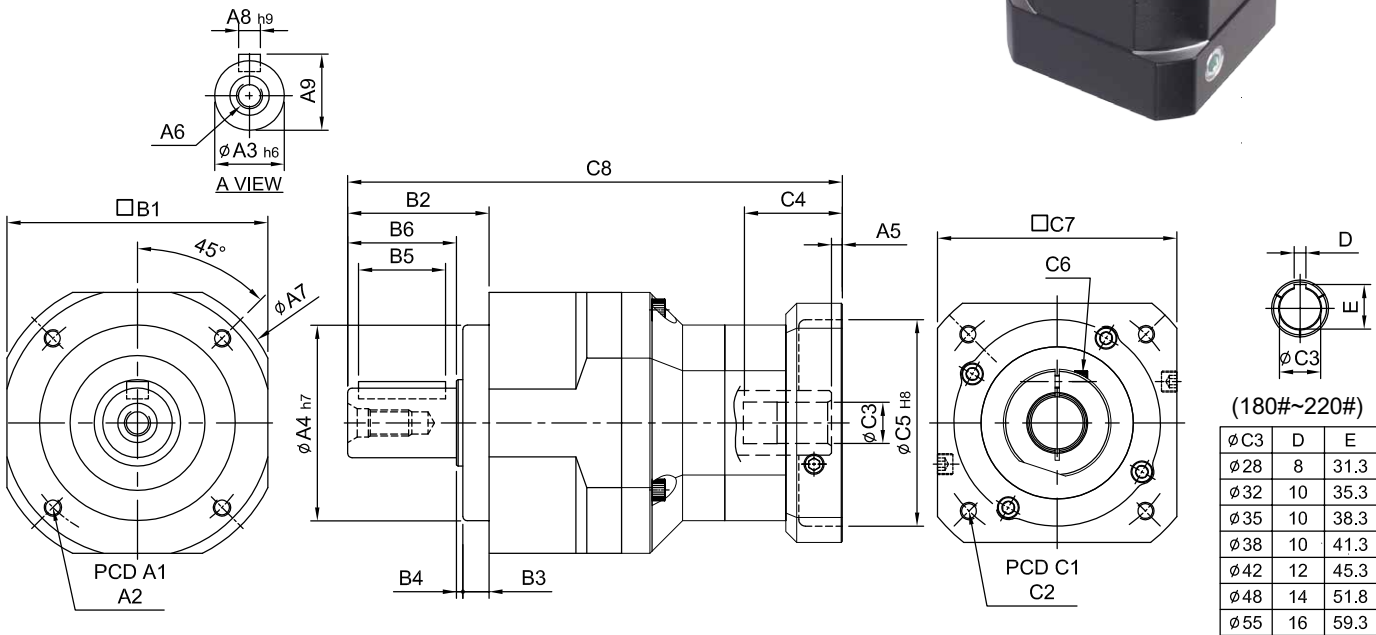
Ratio	44	62	90	120	142	180	220
3	0.03	0.16	0.61	3.25	9.21	28.98	69.61
4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
8	0.03	0.13	0.44	2.58	7.07	22.59	50.84
9	0.03	0.13	0.44	2.57	7.04	22.53	50.63
10	0.03	0.13	0.44	2.57	7.03	22.51	50.56

SERVOBOX Planetary Reducers

MODEL : SE

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100



	Model Code	62	90	120	142	180	220
	A1	62	82	110	140	184	218
A	A2	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 X P1.5	M12 x P1.75	M16 x P2.0
	A3	16	22	32	40	55	75
	A4	50	70	90	120	160	180
	A5	5	6	9・23.5	10・20	10	11.5・13.5
	A6	M5 x P0.8	M8 x P1.25	M10 X P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	70	102	134	166	215	252
	A8	5	6	10	12	16	20
	A9	18	24.5	35	43	59	79.5
	B	B1	62	90	120	142	180
B2		36	46	65	92	106	139
B3		7	8	12	15	20	30
B4		1	2	3	3	4	5
B5		20	30	40	65	70	90
B6		28	36	50	74	82	104
C	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・215	200・215・265
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12	M10・M12
	C3	8・9・11	11・14・16・19	16・19・22・24	22・24・28・32	28・32・35・38	35・38・42・48・55
	C4	26・30.5	33.5・41.5	59・73.5	67・77	84.5	114.5・116.5
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	110・130・180	114.3・180・230
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190	182・200・250
	C8	139.5	172.5・180.5	241・255.5	298.5・308.5	358.5	446.5

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	59	165	335	625	1,206	2,030
			20	51	146	300	555	1,069	1,804
			25	48	160	333	618	1,189	2,010
			30	45	151	311	583	1,118	1,911
			35	45	149	309	573	1,108	1,870
			40	43	143	298	553	1,070	1,824
			50	48	160	333	618	1,189	2,010
			60	45	151	311	583	1,118	1,911
			70	45	149	309	573	1,108	1,870
			80	43	143	298	553	1,070	1,824
			90	44	145	278	516	993	1,694
			100	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque					
額定輸入轉速 Rated Input Speed	n_{IN}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{IB}	rpm	15 ~ 100	6,000	6,000	6,000	5,000	5,000	4,000
背隙 Backlash Ps		arcmin	15 ~ 100	-	-	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P0		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P1		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P2		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	15 ~ 100	≥ 94%					
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C					
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			15 ~ 100	IP65					
安裝方向 Mounting Position			15 ~ 100	任意方向 Any					
噪音值 Noise Level		dB	15 ~ 100	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	15 ~ 100	1.68	4.4	9.3	15.5	34.8	56.5

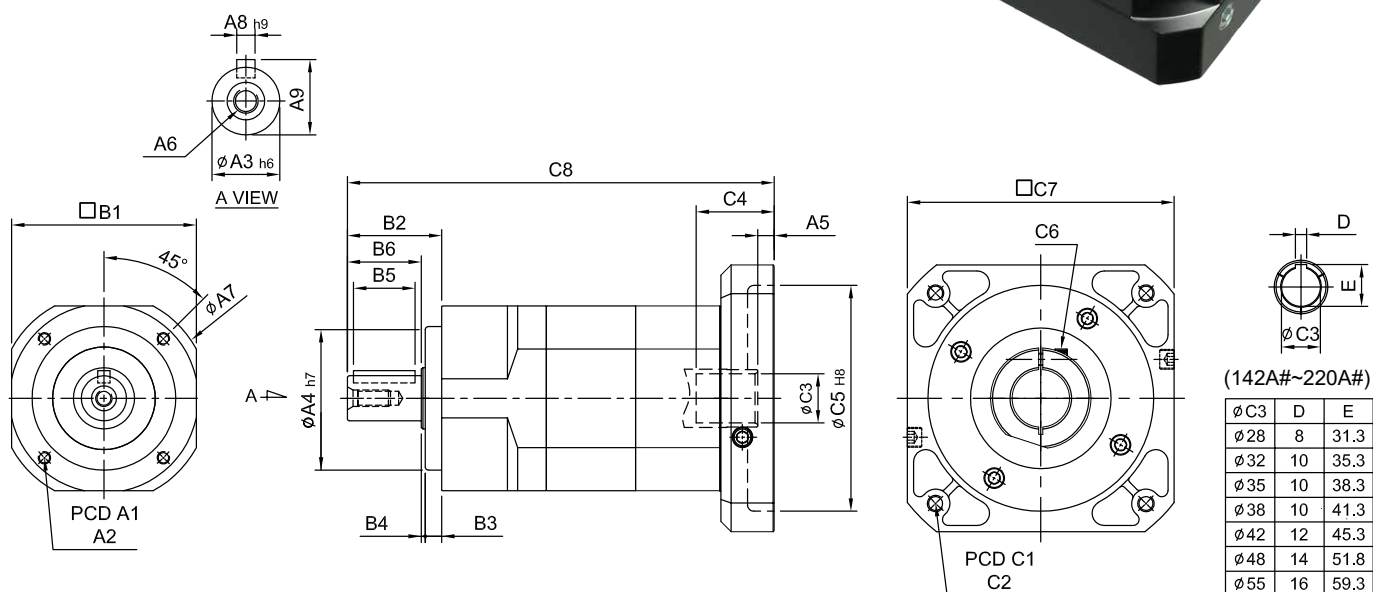
 ■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	62	90	120	142	180	220
15	0.03	0.14	0.46	2.63	7.3	22.79
20	0.03	0.14	0.46	2.63	7.3	22.79
25	0.03	0.14	0.46	2.63	7.1	22.79
30	0.03	0.14	0.46	2.43	7.1	22.59
35	0.03	0.14	0.44	2.43	7.1	22.59
40	0.03	0.14	0.44	2.43	6.92	22.59
50	0.03	0.14	0.44	2.43	6.92	22.59
60	0.03	0.14	0.43	2.39	6.72	21.83
70	0.03	0.14	0.43	2.39	6.72	21.83
80	0.03	0.14	0.43	2.39	6.72	21.83
90	0.03	0.14	0.40	2.39	6.72	21.60
100	0.03	0.14	0.40	2.39	6.72	21.60

MODEL : SE-A

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100



unit: mm

A	Model Code	44A	62A	90A	120A	142A	180A	220A
	A1	44	62	82	110	140	184	218
	A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
	A3	13	16	22	32	40	55	75
	A4	35	50	70	90	120	160	180
	A5	5	6	9 · 23.5	10 · 20	10	11.5 · 13.5	12.5 · 14.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	50	70	102	134	166	215	252
	A8	5	5	6	10	12	16	20
B	A9	15	18	24.5	35	43	59	79.5
	B1	44	62	90	120	142	180	220
	B2	26	36	46	65	92	106	139
	B3	5	7	8	12	15	20	30
	B4	1	1	2	3	3	4	5
	B5	15	20	30	40	65	70	90
C	B6	20	28	36	50	74	82	104
	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265	200 · 265 · 300
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12	M12 · M16
	C3	8 · 9 · 11	11 · 14 · 16 · 19	16 · 19 · 22 · 24	22 · 24 · 28 · 32	28 · 32 · 35 · 38	35 · 38 · 42 · 48 · 55	38 · 42 · 48 · 55
	C4	26 · 30.5	33.5	59 · 73.5	67 · 77	84.5	114.5 · 116.5	117.5 · 119.5
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265
	C8	121	148.8	208 · 222.5	261 · 271	327	404.5	460.5

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	44A	62A	90A	120A	142A	180A	220A
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	19	59	165	335	625	1,206	2,030
			20	16	51	146	300	555	1,069	1,804
			25	16	48	160	333	618	1,189	2,010
			30	15	45	151	311	583	1,118	1,911
			35	15	45	149	309	573	1,108	1,870
			40	14	43	143	298	553	1,070	1,824
			50	16	48	160	333	618	1,189	2,010
			60	15	45	151	311	583	1,118	1,911
			70	15	45	149	309	573	1,108	1,870
			80	14	43	143	298	553	1,070	1,824
			90	13	44	145	278	516	993	1,694
			100	14	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{IN}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{IB}	rpm	15 ~ 100	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	15 ~ 100	-	-	-	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P0		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P1		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P2		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	380	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	190	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	15 ~ 100	≥ 94%						
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C						
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			15 ~ 100	IP65						
安裝方向 Mounting Position			15 ~ 100	任意方向 Any						
噪音值 Noise Level		dB	15 ~ 100	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	15 ~ 100	0.9	2	6	10.2	22.5	42	59

轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	44A	62A	90A	120A	142A	180A	220A
15	0.03	0.14	0.46	2.63	7.30	22.79	56.98
20	0.03	0.14	0.46	2.63	7.30	22.79	56.98
25	0.03	0.14	0.46	2.63	7.10	22.79	56.98
30	0.03	0.14	0.46	2.43	7.10	22.59	56.48
35	0.03	0.14	0.44	2.43	7.10	22.59	56.48
40	0.03	0.14	0.44	2.43	6.92	22.59	56.48
50	0.03	0.14	0.44	2.39	6.92	22.59	56.48
60	0.03	0.14	0.43	2.39	6.72	21.83	54.58
70	0.03	0.14	0.43	2.39	6.72	21.83	54.58
80	0.03	0.14	0.43	2.39	6.72	21.83	54.58
90	0.03	0.14	0.40	2.39	6.72	21.60	54.00
100	0.03	0.14	0.40	2.39	6.72	21.60	54.00

SERVOBOX Planetary Reducers

MODEL : SE

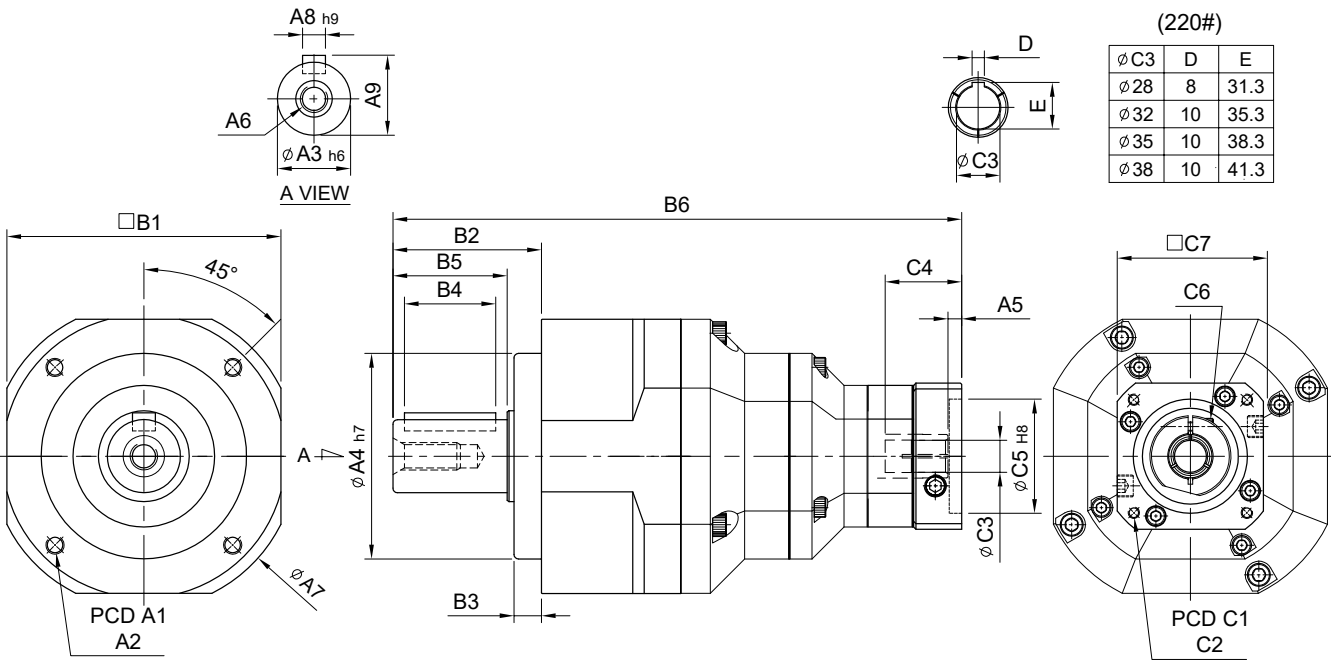
三段 3-Stage

RATIO : 125, 150, 175, 200, 250, 300, 350,
400, 450, 500, 600, 700, 800, 900, 1000



(220#)

φC3	D	E
φ28	8	31.3
φ32	10	35.3
φ35	10	38.3
φ38	10	41.3



	Model Code	90	120	142	180	220
	A1	82	110	140	184	218
A	A2	M6 x P1.0	M8 x P1.25	M10 X P1.5	M12 x P1.75	M16 x P2.0
	A3	22	32	40	55	75
	A4	70	90	120	160	180
	A5	5	6	9・23.5	10・20	10
	A6	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	102	134	166	215	252
	A8	6	10	12	16	20
	A9	24.5	35	43	59	79.5
	B	B1	90	120	142	180
B2		46	65	92	106	139
B3		8	12	15	20	30
B4		30	40	65	70	90
B5		36	50	74	82	104
B6		195	249・257	334.5・349	396.5・406.5	481.5
C	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・215
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12
	C3	8・9・11	11・14・16・19	16・19・22・24	22・24・28・32	28・32・35・38
	C4	26・30.5	33.5・41.5	59・73.5	67・77	84.5
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	110・130・180
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	125	160	333	618	1,189	2,010
			150	165	335	625	1,206	2,030
			175	149	309	573	1,108	1,870
			200	146	300	555	1,069	1,804
			250	160	333	618	1,189	2,010
			300	151	311	583	1,118	1,911
			350	149	309	573	1,108	1,870
			400	143	298	553	1,070	1,824
			450	145	278	516	993	1,694
			500	160	333	618	1,189	2,010
			600	151	311	583	1,118	1,911
			700	149	309	573	1,108	1,870
			800	143	298	553	1,070	1,824
			900	145	278	516	993	1,694
			1000	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	125 ~ 1000	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque				
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	125 ~ 1000	3 倍額定輸出力矩 3 Times of Rated Output Torque				
急停扭矩 Emergency Stop Torque								
額定輸入轉速 Rated Input Speed	n_{IN}	rpm	125 ~ 1000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{IB}	rpm	125 ~ 1000	6,000	6,000	6,000	5,000	5,000
背隙 Backlash Ps		arcmin	125 ~ 1000	-	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P0		arcmin	125 ~ 1000	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P1		arcmin	125 ~ 1000	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
背隙 Backlash P2		arcmin	125 ~ 1000	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11
扭轉剛性 Torsional Rigidity		Nm/arcmin	125 ~ 1000	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	125 ~ 1000	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	125 ~ 1000	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	125 ~ 1000	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
效率 Efficiency	η	%	125 ~ 1000	≥ 90%				
使用溫度 Operating Temperature		°C	125 ~ 1000	- 25 °C ~ + 90 °C				
潤滑 Lubrication			125 ~ 1000	全合成潤滑油脂 Synthetic Grease				
防護等級 Protection Class			125 ~ 1000	IP65				
安裝方向 Mounting Position			125 ~ 1000	任意方向 Any				
噪音值 Noise Level		dB	125 ~ 1000	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	125 ~ 1000	4.9	10	23	47	70

轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	90	120	142	180	220
125	0.01	0.04	0.71	1.42	3.29
150	0.01	0.04	0.51	0.92	2.15
175	0.01	0.04	0.40	0.83	1.26
200	0.01	0.04	0.21	0.65	0.98
250	0.01	0.04	0.11	0.52	0.82
300	0.01	0.04	0.09	0.21	0.82
350	0.01	0.04	0.09	0.21	0.82
400	0.01	0.04	0.09	0.21	0.82
450	0.01	0.04	0.09	0.21	0.51
500	0.01	0.04	0.08	0.12	0.51
600	0.01	0.04	0.08	0.12	0.25
700	0.01	0.04	0.08	0.12	0.25
800	0.01	0.04	0.08	0.12	0.25
900	0.01	0.04	0.08	0.12	0.25
1000	0.01	0.04	0.08	0.12	0.25

SERVOBOX Planetary Reducers

MODEL : SE-A

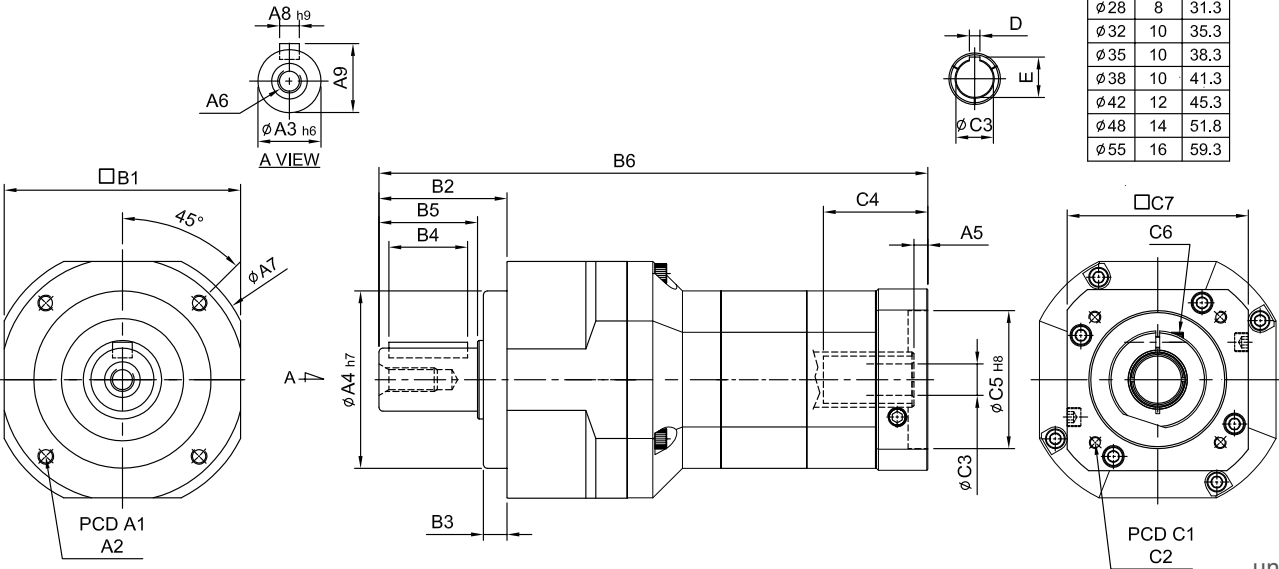
三段 3-Stage

RATIO : 125, 150, 175, 200, 250, 300, 350,
400, 450, 500, 600, 700, 800, 900, 1000



(180A#~220A#)

φC3	D	E
φ28	8	31.3
φ32	10	35.3
φ35	10	38.3
φ38	10	41.3
φ42	12	45.3
φ48	14	51.8
φ55	16	59.3



A	Model Code	62A	90A	120A	142A	180A	220A
	A1	62	82	110	140	184	218
	A2	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
	A3	16	22	32	40	55	75
	A4	50	70	90	120	160	180
	A5	6.5	6	9・23.5	10・20	10	11.5・13.5
	A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	70	102	134	166	215	252
	A8	5	6	10	12	16	20
	A9	18	24.5	35	43	59	79.5
B	B1	62	90	120	142	180	220
	B2	36	46	65	92	106	139
	B3	7	8	12	15	20	30
	B4	20	30	40	65	70	90
	B5	28	36	50	74	82	104
	B6	165.5	204.5・212.5	284.5	354.5	425	527.5
C	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・215	200・215・265
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12	M10・M12
	C3	8・9・11	11・14・16・19	16・19・22・24	22・24・28・32	28・32・35・38	35・38・42・48・55
	C4	26・30.5	33.5・41.5	59・73.5	67・77	84.5	114.5・116.5
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	110・130・180	114.3・180・230
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190	182・200・250

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62A	90A	120A	142A	180A	220A
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	125	48	160	333	618	1,189	2,010
			150	59	165	335	625	1,206	2,030
			175	45	149	309	573	1,108	1,870
			200	51	146	300	555	1,069	1,804
			250	48	160	333	618	1,189	2,010
			300	45	151	311	583	1,118	1,911
			350	45	149	309	573	1,108	1,870
			400	43	143	298	553	1,070	1,824
			450	44	145	278	516	993	1,694
			500	48	160	333	618	1,189	2,010
			600	45	151	311	583	1,118	1,911
			700	45	149	309	573	1,108	1,870
			800	43	143	298	553	1,070	1,824
			900	44	145	278	516	993	1,694
			1000	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	125 ~ 1000	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	125 ~ 1000	3 倍額定輸出力矩 3 Times of Rated Output Torque					
急停扭矩 Emergency Stop Torque									
額定輸入轉速 Rated Input Speed	n_{IN}	rpm	125 ~ 1000	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{IB}	rpm	125 ~ 1000	6,000	6,000	6,000	5,000	5,000	4,000
背隙 Backlash Ps		arcmin	125 ~ 1000	-	-	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P0		arcmin	125 ~ 1000	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P1		arcmin	125 ~ 1000	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
背隙 Backlash P2		arcmin	125 ~ 1000	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11
扭轉剛性 Torsional Rigidity		Nm/arcmin	125 ~ 1000	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	125 ~ 1000	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	125 ~ 1000	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_H	hr	125 ~ 1000	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation : >30,000 (S1 Continuous Operation : >15,000 hrs)					
效率 Efficiency	η	%	125 ~ 1000	≥ 90%					
使用溫度 Operating Temperature		°C	125 ~ 1000	- 25° C ~ + 90° C					
潤滑 Lubrication			125 ~ 1000	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			125 ~ 1000	IP65					
安裝方向 Mounting Position			125 ~ 1000	任意方向 Any					
噪音值 Noise Level		dB	125 ~ 1000	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	125 ~ 1000	2.5	6.5	13	26	56.5	86

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

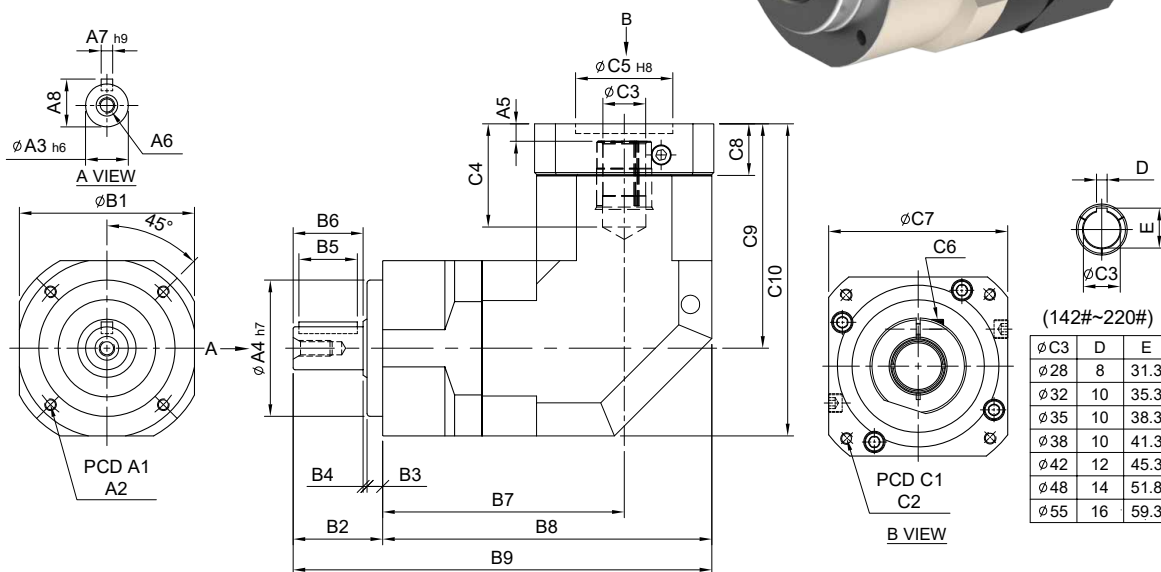
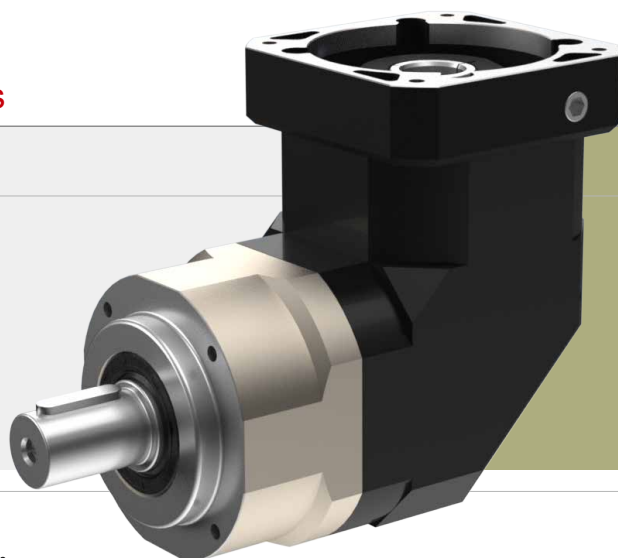
Ratio	62A	90A	120A	142A	180A	220A
125	0.01	0.01	0.04	0.71	1.42	3.29
150	0.01	0.01	0.04	0.51	0.92	2.15
175	0.01	0.01	0.04	0.4	0.83	1.26
200	0.01	0.01	0.04	0.21	0.65	0.98
250	0.01	0.01	0.04	0.11	0.52	0.82
300	0.01	0.01	0.04	0.09	0.21	0.82
350	0.01	0.01	0.04	0.09	0.21	0.82
400	0.01	0.01	0.04	0.09	0.21	0.82
450	0.01	0.01	0.04	0.09	0.21	0.51
500	0.01	0.01	0.04	0.08	0.12	0.51
600	0.01	0.01	0.04	0.08	0.12	0.25
700	0.01	0.01	0.04	0.08	0.12	0.25
800	0.01	0.01	0.04	0.08	0.12	0.25
900	0.01	0.01	0.04	0.08	0.12	0.25
1000	0.01	0.01	0.04	0.08	0.12	0.25

SERVOPBOX Planetary Reducers

MODEL : SEL

單段 1-Stage

RATIO : 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20



unit: mm

	Model Code	44	62	90	120	142	180	220
A	A1	44	62	82	110	140	184	218
	A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
	A3	13	16	22	32	40	55	75
	A4	35	50	70	90	120	160	180
	A5	6	6	9・23.5	10・20	10	12.5・14.5	12.5・14.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
B	B1	44	62	90	120	142	180	220
	B2	26	36	46	65	92	106	139
	B3	5	7	8	12	15	20	30
	B4	1	1	2	3	3	4	5
	B5	15	20	30	40	65	70	90
	B6	20	28	36	50	74	82	104
	B7	76	84.5	122.1	148	165.5	223.6	231.6
	B8	98	115.5	167.1	208	236.5	313.6	341.6
C	B9	124	151.5	215.1	273	328.5	419.6	480.6
	C1	46・60・63	70・75・90	90・110・115・145	115・145・165	145・165・215	200・215・265	200・265・300
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12	M10・M12・M16	M12・M16
	C3	8・11	11・14・16・19	16・19・22・24	24・28・32	28・32・35・38	35・38・42・48・55	38・42・48・55
	C4	27	33.5・42	53・58・67.5	67・77	67・84	117・119	117・119
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	110・130・180	114.3・180・230	114.3・230・250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・180・190	182・200・250	222・250・265
	C8	16	21.5	26.5・41	35.5・45.5	35.5	45.5・47.5	45.5・47.5
	C9	61	77・85	115.3・129.8	141・151	165.7	235・237	235・237
	C10	83	108・116	160.3・174.8	201・211	236.7	325・327	345・347

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	44	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	19	59	165	335	625	1,206	2,030
			4	16	51	146	300	555	1,069	1,804
			5	16	48	160	333	618	1,189	2,010
			6	15	45	151	311	583	1,118	1,911
			7	15	45	149	309	573	1,108	1,870
			8	14	43	143	298	553	1,070	1,824
			9	13	44	145	278	516	993	1,694
			10	14	43	141	294	549	1,059	1,779
			12	15	45	151	311	583	1,118	1,911
			14	15	45	149	309	573	1,108	1,870
			16	14	43	143	298	553	1,070	1,824
			18	13	44	145	278	516	993	1,694
			20	14	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 20	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	3 ~ 20	3 倍額定輸出力矩 3 Times of Rated Output Torque						
急停扭矩 Emergency Stop Torque										
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 20	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 20	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	3 ~ 20	-	-	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2
背隙 Backlash P0		arcmin	3 ~ 20	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P1		arcmin	3 ~ 20	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
背隙 Backlash P2		arcmin	3 ~ 20	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 20	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 20	380	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 20	190	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_{H1}	hr	3 ~ 20	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	3 ~ 20	≥ 95%						
使用溫度 Operating Temperature		°C	3 ~ 20	- 25° C ~ + 90° C						
潤滑 Lubrication			3 ~ 20	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			3 ~ 20	IP65						
安裝方向 Mounting Position			3 ~ 20	任意方向 Any						
噪音值 Noise Level		dB	3 ~ 20	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	3 ~ 20	0.8	2.8	6.3	9.2	22.5	52.3	75

轉動慣量 Mass Moments of Inertia (kg.cm²)

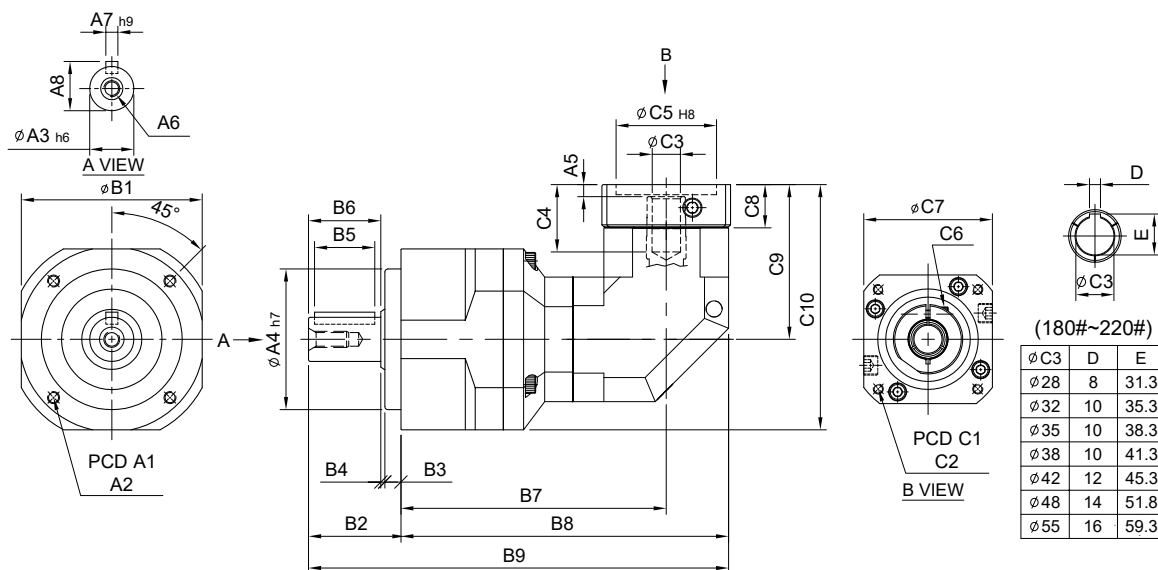
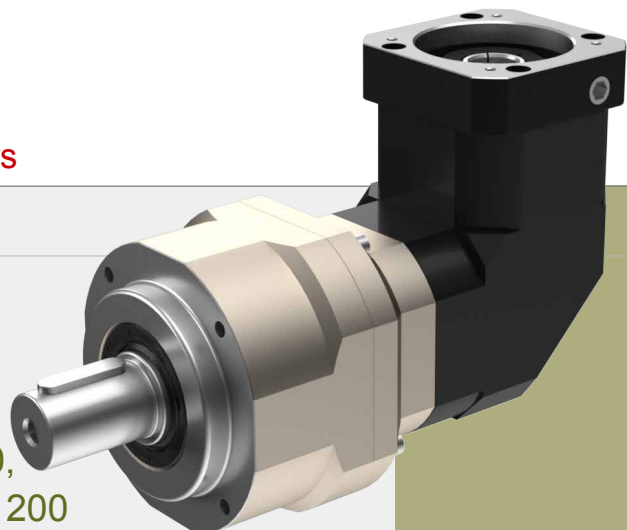
Ratio	44	62	90	120	142	180	220
3	0.09	0.36	2.28	6.85	23.5	68.2	135
4	0.09	0.36	2.28	6.85	23.5	68.2	135
5	0.09	0.36	2.28	6.85	23.5	68.2	135
6	0.09	0.36	2.28	6.85	23.5	68.2	135
7	0.09	0.36	2.28	6.85	23.5	68.2	135
8	0.09	0.36	2.28	6.85	23.5	68.2	135
9	0.09	0.36	2.28	6.85	23.5	68.2	135
10	0.09	0.36	2.28	6.85	23.5	68.2	135
12	0.03	0.08	1.88	6.2	21.8	65.5	119.2
14	0.03	0.08	1.88	6.2	21.8	65.5	119.2
16	0.03	0.08	1.88	6.2	21.8	65.5	119.2
18	0.03	0.08	1.88	6.2	21.8	65.5	119.2
20	0.03	0.08	1.88	6.2	21.8	65.5	119.2

SERVBOX Planetary Reducers

MODEL : SEL

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70,
80, 90, 100, 120, 140, 160, 180, 200



unit: mm

	Model Code						
		62	90	120	142	180	220
A	A1	62	82	110	140	184	218
	A2	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
	A3	16	22	32	40	55	75
	A4	50	70	90	120	160	180
	A5	6	6	9・23.5	10・20	10	12.5・14.5
	A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	6	10	12	16	20
	A8	18	24.5	35	43	59	79.5
B	B1	62	90	120	142	180	220
	B2	36	46	65	92	106	139
	B3	7	8	12	15	20	30
	B4	1	2	3	3	4	5
	B5	20	30	40	65	70	90
	B6	28	36	50	74	82	104
	B7	110.5	132	181.6	214.5	249.5	313.6
	B8	132.5	163	226.6	274.5	320.5	403.6
	B9	168.5	209	291.6	366.5	426.5	542.6
C	C1	46・60・63	70・75・90	90・110・115・145	115・145・165	145・165・215	200・215・265
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12	M12・M16
	C3	8・11	11・14・16・19	16・19・22・24	24・28・32	28・32・35・38	35・38・42・48・55
	C4	27	33.5・42	53・58・67.5	67・77	67・84	117・119
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	110・130・180	114.3・180・200・230・250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・180・190	182・200・220・250・265
	C8	16	21.5	26.5・41	35.5・45.5	35.5	45.5・47.5
	C9	61	77・85	115.3・129.8	141・151	165.7	235・237
	C10	92	122・130	175.3・189.8	212・222	255.7	345・347

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	59	165	335	625	1,206	2,030
			20	51	146	300	555	1,069	1,804
			25	48	160	333	618	1,189	2,010
			30	45	151	311	583	1,118	1,911
			35	45	149	309	573	1,108	1,870
			40	43	143	298	553	1,070	1,824
			50	48	160	333	618	1,189	2,010
			60	45	151	311	583	1,118	1,911
			70	45	149	309	573	1,108	1,870
			80	43	143	298	553	1,070	1,824
			90	44	145	278	516	993	1,694
			100	43	141	294	549	1,059	1,779
			120	45	151	311	583	1,118	1,911
			140	45	149	309	573	1,108	1,870
			160	43	143	298	553	1,070	1,824
			180	44	145	278	516	993	1,694
			200	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 200	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	15 ~ 200	3 倍額定輸出力矩 3 Times of Rated Output Torque					
急停扭矩 Emergency Stop Torque									
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 200	6,000	6,000	6,000	5,000	5,000	4,000
背隙 Backlash Ps		arcmin	15 ~ 200	-	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P0		arcmin	15 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P1		arcmin	15 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
背隙 Backlash P2		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 200	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 200	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 200	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_{IH}	hr	15 ~ 200	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation : >30,000 (S1 Continuous Operation : >15,000 hrs)					
效率 Efficiency	η	%	15 ~ 200	≥ 92%					
使用溫度 Operating Temperature		°C	15 ~ 200	- 25° C ~ + 90° C					
潤滑 Lubrication			15 ~ 200	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			15 ~ 200	IP65					
安裝方向 Mounting Position			15 ~ 200	任意方向 Any					
噪音值 Noise Level		dB	15 ~ 200	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	15 ~ 200	1.8	5.8	12	22.8	43.9	78.5

轉動慣量 Mass Moments of Inertia (kg.cm²)

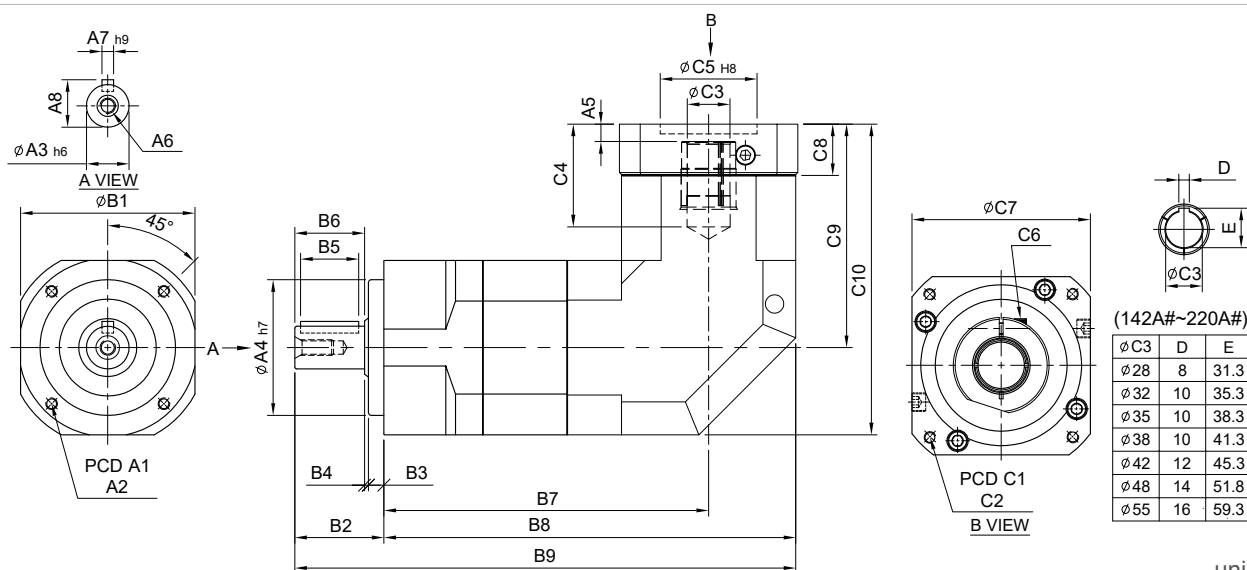
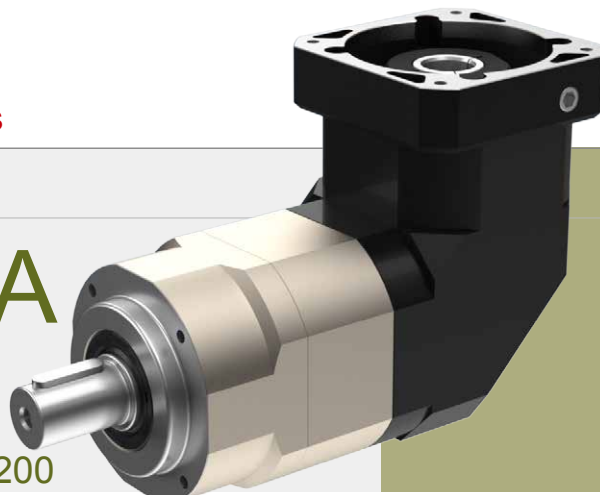
Ratio	62	90	120	142	180	220
15	0.09	0.36	6.28	6.85	26.2	70.1
20	0.09	0.36	6.28	6.85	26.2	70.1
25	0.09	0.36	2.28	6.85	23.1	68.2
30	0.09	0.36	2.28	6.85	23.1	68.2
35	0.09	0.36	2.28	6.85	23.1	68.2
40	0.09	0.36	2.28	6.85	23.1	68.2
50	0.09	0.36	2.28	6.85	23.1	68.2
60	0.09	0.36	2.28	6.85	23.1	68.2
70	0.09	0.36	2.28	6.85	23.1	68.2
80	0.09	0.36	2.28	6.85	23.1	68.2
90	0.09	0.36	2.28	6.85	23.1	68.2
100	0.09	0.36	2.28	6.85	23.1	68.2
120	0.03	0.1	1.88	6.2	21.2	65.1
140	0.03	0.1	1.88	6.2	21.2	65.1
160	0.03	0.1	1.88	6.2	21.2	65.1
180	0.03	0.1	1.88	6.2	21.2	65.1
200	0.03	0.1	1.88	6.2	21.2	65.1

SERVOBOX Planetary Reducers

MODEL : SEL-A

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70,
80, 90, 100, 120, 140, 160, 180, 200



unit: mm

	Model Code	44A	62A	90A	120A	142A	180A	220A
		A1	A2	A3	A4	A5	A6	A7
A	A1	44	62	82	110	140	184	218
	A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
	A3	13	16	22	32	40	55	75
	A4	35	50	70	90	120	160	180
	A5	6	6	9 · 23.5	10 · 20	10	12.5 · 14.5	12.5 · 14.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
B	B1	44	62	90	120	142	180	220
	B2	26	36	46	65	92	106	139
	B3	5	7	8	12	15	20	30
	B4	1	1	2	3	3	4	5
	B5	15	20	30	40	65	70	90
	B6	20	28	36	50	74	82	104
	B7	102	118.3	167.6	204	232	304.6	324.6
	B8	124	149.3	212.6	264	303	394.6	434.6
C	B9	150	185.3	258.6	329	395	500.6	573.6
	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265	200 · 265 · 300
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
	C3	8 · 11	11 · 14 · 16 · 19	16 · 19 · 22 · 24	24 · 28 · 32	28 · 32 · 35 · 38	35 · 38 · 42 · 48 · 55	38 · 42 · 48 · 55
	C4	27	33.5 · 42	53 · 58 · 67.5	67 · 77	67 · 84	117 · 119	117 · 119
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	220 · 250 · 265
	C8	16	21.5	26.5 · 41	35.5 · 45.5	35.5	45.5 · 47.5	45.5 · 47.5
	C9	61	77	115.3 · 129.8	141 · 151	165.7	235 · 237	235 · 237
	C10	83	108	160.3 · 174.8	201 · 211	236.7	325 · 327	345 · 347

High Precision Planetary Reducer

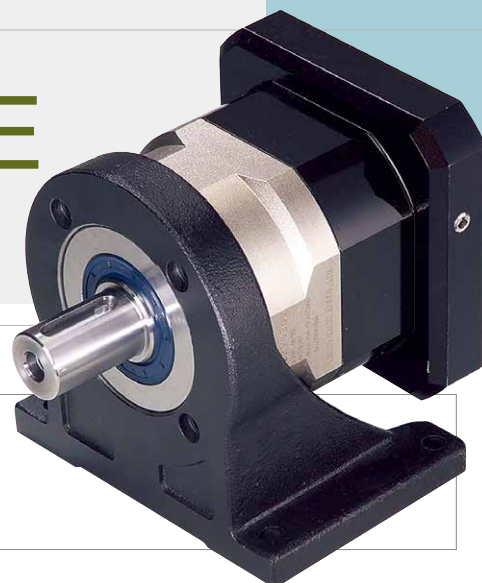
規格 Parameter	代號	單位 Unit	速比 Ratio	44A	62A	90A	120A	142A	180A	220A
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	19	59	165	335	625	1,206	2,030
			20	16	51	146	300	555	1,069	1,804
			25	16	48	160	333	618	1,189	2,010
			30	15	45	151	311	583	1,118	1,911
			35	15	45	149	309	573	1,108	1,870
			40	14	43	143	298	553	1,070	1,824
			50	16	48	160	333	618	1,189	2,010
			60	15	45	151	311	583	1,118	1,911
			70	15	45	149	309	573	1,108	1,870
			80	14	43	143	298	553	1,070	1,824
			90	13	44	145	278	516	993	1,694
			100	14	43	141	294	549	1,059	1,779
			120	15	45	151	311	583	1,118	1,911
			140	15	45	149	309	573	1,108	1,870
			160	14	43	143	298	553	1,070	1,824
			180	13	44	145	278	516	993	1,694
			200	14	43	141	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 200	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	15 ~ 200	3 倍額定輸出力矩 3 Times of Rated Output Torque						
急停扭矩 Emergency Stop Torque										
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 200	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	15 ~ 200	-	-	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P0		arcmin	15 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P1		arcmin	15 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
背隙 Backlash P2		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 200	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 200	380	1,180	3,200	6,800	9,300	15,600	51,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 200	190	590	1,600	3,400	4,650	7,800	25,500
使用壽命 Service Life	L_{H1}	hr	15 ~ 200	S5 周期運轉: >30,000 (S1 連續運轉: >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	15 ~ 200	≥ 92%						
使用溫度 Operating Temperature		°C	15 ~ 200	-25°C ~ +90°C						
潤滑 Lubrication			15 ~ 200	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			15 ~ 200	IP65						
安裝方向 Mounting Position			15 ~ 200	任意方向 Any						
噪音值 Noise Level		dB	15 ~ 200	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	15 ~ 200	1	2.9	8	12	22.6	51.7	94.5

轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	44A	62A	90A	120A	142A	180A	220A
15	0.09	0.36	2.28	6.85	23.45	55.2	80.2
20	0.09	0.36	2.28	6.85	23.45	55.2	80.2
25	0.09	0.36	2.28	6.85	23.45	50.4	76.5
30	0.09	0.36	2.28	6.85	23.5	50.4	76.5
35	0.09	0.36	2.28	6.85	23.5	50.4	76.5
40	0.09	0.36	2.28	6.85	23.5	50.4	76.5
50	0.09	0.36	2.28	6.85	23.5	50.4	76.5
60	0.09	0.36	2.28	6.85	23.5	50.4	76.5
70	0.09	0.36	2.28	6.85	23.5	50.4	76.5
80	0.09	0.36	2.28	6.85	23.5	50.4	76.5
90	0.09	0.36	2.28	6.85	23.5	50.4	76.5
100	0.09	0.36	2.28	6.85	23.5	50.4	76.5
120	0.03	0.08	1.88	6.2	21.8	48.7	74.2
140	0.03	0.08	1.88	6.2	21.8	48.7	74.2
160	0.03	0.08	1.88	6.2	21.8	48.7	74.2
180	0.03	0.08	1.88	6.2	21.8	48.7	74.2
200	0.03	0.08	1.88	6.2	21.8	48.7	74.2

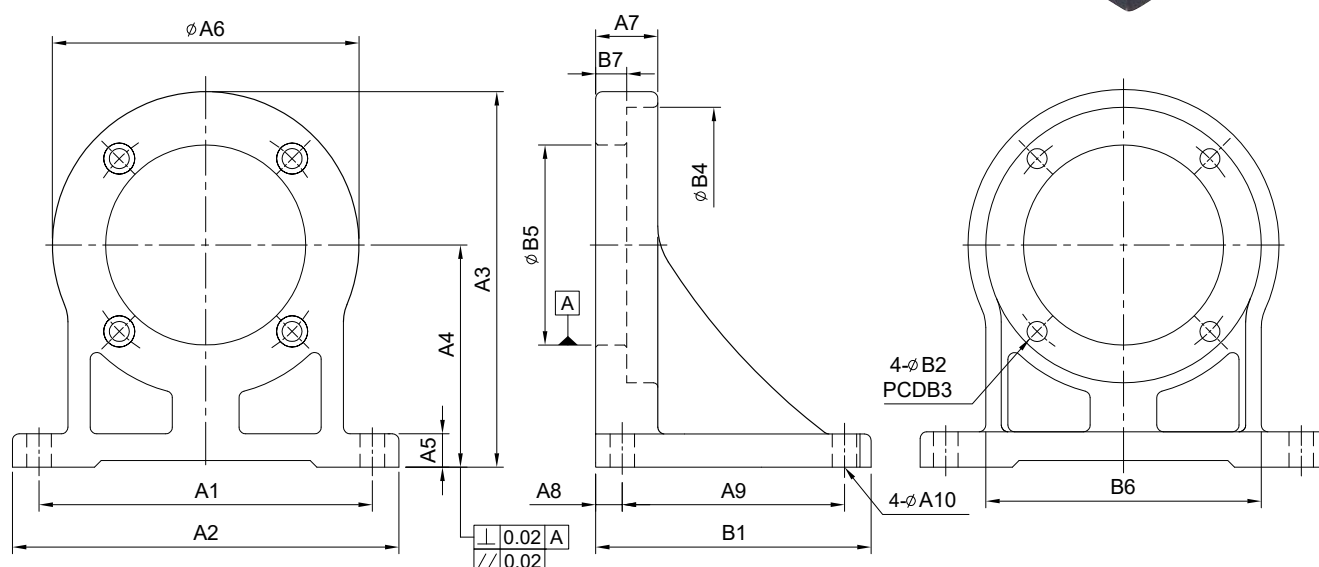
Accessories for SE

SE 選配件



L Type Base Kits

L 型腳座



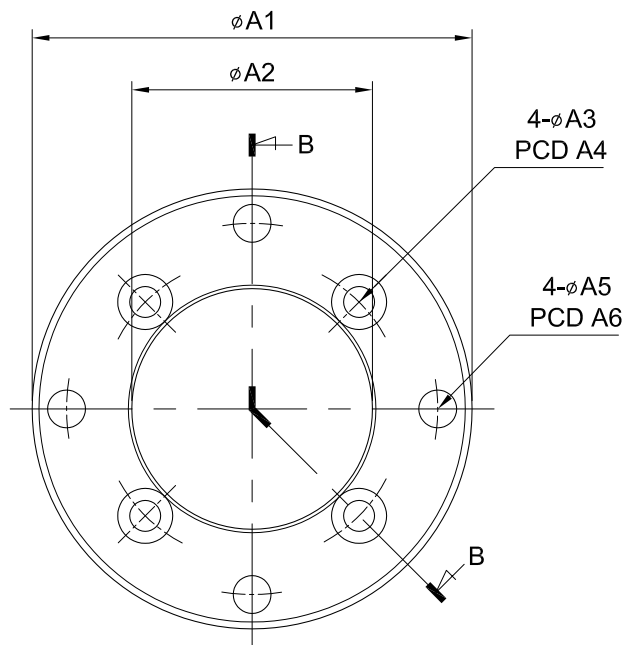
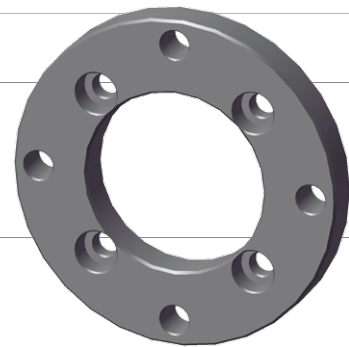
unit: mm

	Model Code	44	62	90	120	142	180	220
A	A1	70	90	110	150	190	240	280
	A2	88	108	130	176	220	276	330
	A3	75.5	95.5	127	170	207.5	274	334
	A4	45	55	75	100	120	160	200
	A5	8	9	11	16	19	24	30
	A6	60	81	104	140	175	228	268
	A7	13	16	21	28	35	45	60
	A8	10	10	11	14	16	19	26
	A9	40	50	75	100	120	160	200
	A10	Ø7	Ø7	Ø9	Ø11	Ø13	Ø17	Ø21
B	B1	60	70	97	128	152	198	252
	B2	Ø4.5	Ø5.5	Ø6.8	Ø9	Ø11	Ø13	Ø17
	B3	44	62	82	110	140	184	218
	B4	50	70	92	124	155	205	242
	B5	35	50	70	90	120	160	180
	B6	50	70	90	125	156	200	230
	B7	6	8	9	14	16	21	30
Weight ±3% (Kg)			0.71	1.57	3.86	6.41	13.44	27.73

High Precision Planetary Reducer

Connecting Plate

連接板



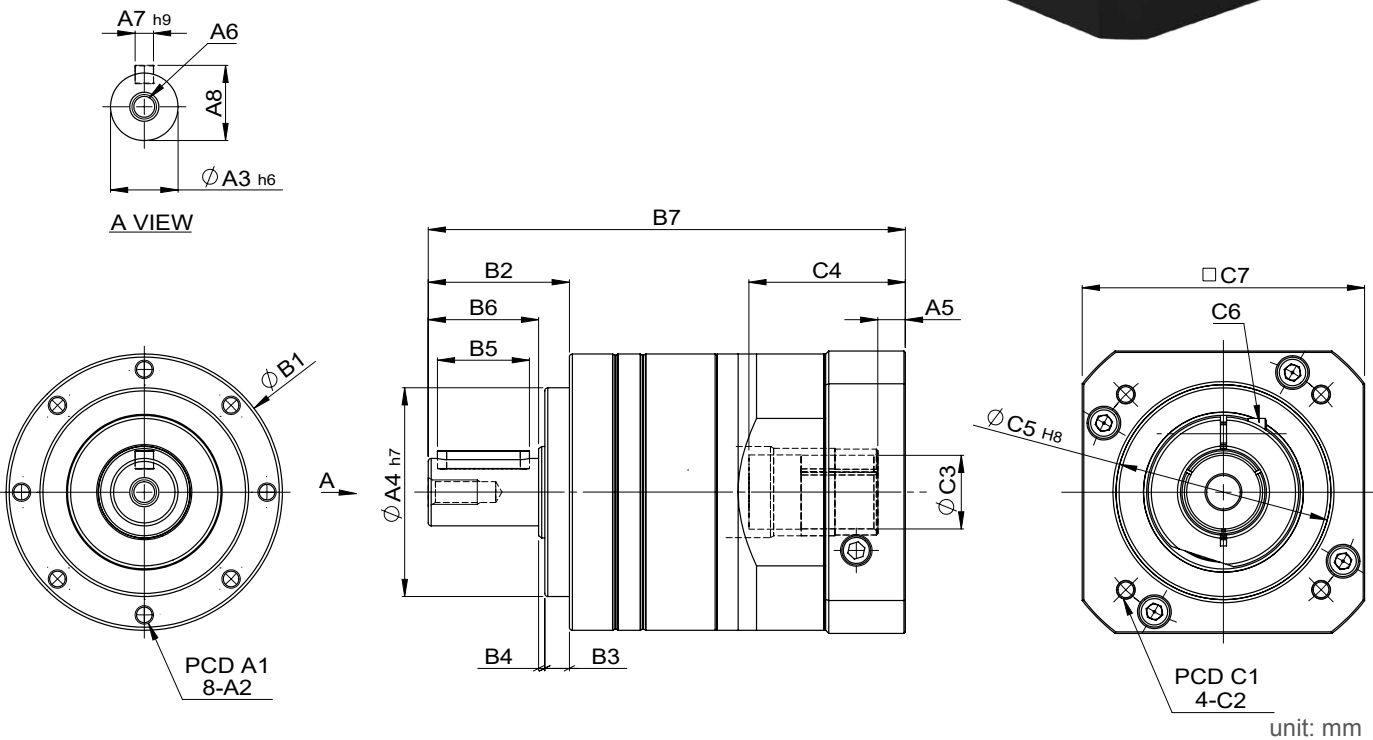
B-B SECTION

unit: mm

A	Model Code	44	62	90	120	142	180	220
	A1	64	88	123	158	188	238	298
	A2	35	50	70	90	120	160	180
	A3	4.5	5.5	6.8	9	11	13	17
	A4	44	62	82	110	140	184	218
	A5	5.5	6.8	9	11	13	15	17
	A6	54	75	106	140	165	210	260
	A7	8	9	11	14	17	22	30

MODEL : SA

單段 1-Stage
RATIO : 3, 4, 5, 7, 10



	Model	50	70	90	120	160
	Code					
A	A1	44	62	80	108	140
	A2	M4 x 0.7	M5 x 0.8	M6 x 1.0	M8 x 1.25	M10 x 1.5
	A3	12	16	22	32	40
	A4	35	52	68	90	120
	A5	4.5	6	9・23.5	10・20	10
	A6	M4 x 0.7	M5 x 0.8	M8 x 1.25	M12 x 1.75	M12 x 1.75
	A7	4	5	6	10	12
	A8	13.5	18	24.5	35	43
B	B1	51	70	90	122	160
	B2	25.5	36	46	70	88
	B3	4	6.5	8	9	8
	B4	1.5	1.5	2	3	2
	B5	15	20	30	50	65
	B6	20	28	36	58	78
	B7	96.5	115	155.5・170	211・221	238.5
C	C1	45・46・63・70	70・75・90	90・100・115・145	115・145・165	165
	C2	M3・M4・M5	M5・M6	M6・M8	M6・M8・M10	M10
	C3	11・14	14・19	19・24	24・28・32	24・28・32
	C4	32	33.5・41	51・65.5	67・77	63
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	130
	C6	M4 x 0.7	M5 x 0.8	M6 x 1.0	M8 x 1.25	M8 x 1.25
	C7	46・55・60	70・75・80	92・110・130	122・130・150	150



High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	90	120	160
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	17	54	165	216	625
			4	15	48	146	208	555
			5	14	45	155	333	618
			7	13	41	142	309	573
			10	12	40	136	294	549
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 10	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque				
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 10	3 倍額定輸出扭矩 3 Times of Rated Output Torque				
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 10	3,000				
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 10	6,000	6,000	6,000	5,000	5,000
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 10	3	3	15	27	60
背隙 Backlash Ps		arcmin	3 ~ 10	-	-	≤ 1	≤ 1	≤ 1
背隙 Backlash P0		arcmin	3 ~ 10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P1		arcmin	3 ~ 10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P2		arcmin	3 ~ 10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 10	320	800	4,150	8,760	9,300
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 10	160	400	3,780	7,500	4,650
使用壽命 Service Life	L_H	hr	3 ~ 10	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
效率 Efficiency	η	%	3 ~ 10	$\geq 97\%$				
使用溫度 Operating Temperature		$^{\circ}\text{C}$	3 ~ 10	$-25^{\circ}\text{C} \sim +90^{\circ}\text{C}$				
潤滑 Lubrication			3 ~ 10	全合成潤滑油脂 Synthetic Grease				
防護等級 Protection Class			3 ~ 10	IP 65				
安裝方向 Mounting Position			3 ~ 10	任意方向 Any				
噪音值 Noise Level		dB	3 ~ 10	≤ 58	≤ 58	≤ 60	≤ 63	≤ 65
重量 Weight $\pm 2\%$		Kg	3 ~ 10	0.6	1.4	2.8	6.7	13.25

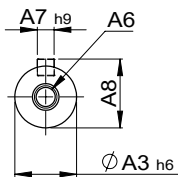
■ 轉動慣量 Mass Moments of Inertia ($\text{kg}\cdot\text{cm}^2$)

速比 Ratio	50	70	90	120	160
3	0.03	0.15	0.60	3.21	9.21
4	0.03	0.15	0.51	2.80	7.54
5	0.03	0.13	0.45	2.71	7.42
7	0.03	0.13	0.42	2.54	7.14
10	0.03	0.13	0.42	2.51	7.03

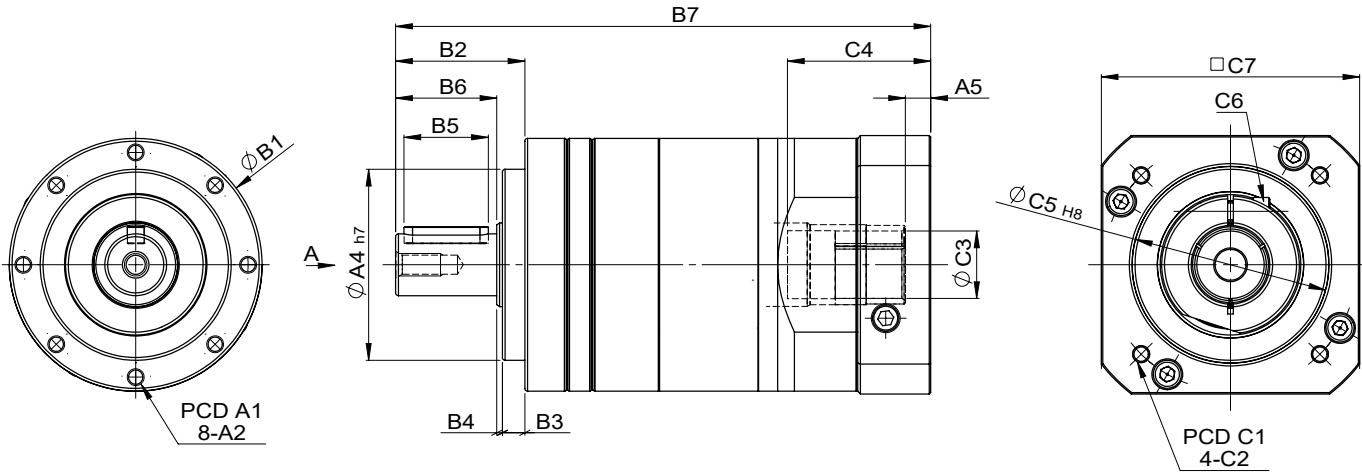
MODEL : SA

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 70, 100



A VIEW



unit: mm

	Model	50	70	90	120	160
	Code					
A	A1	44	62	80	108	140
	A2	M4 x 0.7	M5 x 0.8	M6 x 1.0	M8 x 1.25	M10 x 1.5
	A3	12	16	22	32	40
	A4	35	52	68	90	120
	A5	4.5	6	9・23.5	10・20	10
	A6	M4 x 0.7	M5 x 0.8	M8 x 1.25	M12 x 1.75	M12 x 1.75
	A7	4	5	6	10	12
	A8	13.5	18	24.5	35	43
B	B1	51	70	90	122	160
	B2	25.5	36	46	70	88
	B3	4	6.5	8	9	8
	B4	1.5	1.5	2	3	2
	B5	15	20	30	50	65
	B6	20	28	36	58	78
	B7	122.5	148.8	190.5・205	257	298.5
C	C1	45・46・63・70	70・75・90	90・100・115・145	115・145・165	115・145・165
	C2	M3・M4・M5	M5・M6	M6・M8	M6・M8・M10	M6・M8・M10
	C3	11・14	14・19	19・24	24・28・32	24・28・32
	C4	32	33.5・41	51・65.5	67・77	67
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	95・110・130
	C6	M4 x 0.7	M5 x 0.8	M6 x 1.0	M8 x 1.25	M8 x 1.25
	C7	46・55・60	70・75・80	92・110・130	122・130・150	122・130・150



High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	90	120	160
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	17	54	165	216	625
			20	15	48	146	208	555
			25	14	45	155	333	618
			30	17	54	165	216	625
			35	13	41	142	309	573
			40	15	48	146	208	555
			50	14	45	155	333	618
			70	13	41	142	309	573
			100	12	40	136	294	549
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15~100	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque				
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15~100	3 倍額定輸出扭矩 3 Times of Rated Output Torque				
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15~100	3,000				
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15~100	6,000	6,000	6,000	5,000	5,000
背隙 Backlash Ps		arcmin	15 ~ 100	-	-	≤ 3	≤ 3	≤ 3
背隙 Backlash P0		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P1		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P2		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
扭轉剛性 Torsional Rigidity		Nm/arcmin	15~100	3	3	15	27	60
容許徑向力 Max. Radial Force	F_{2rB}	N	15~100	320	800	4,150	8,760	9,300
容許軸向力 Max. Axial Force	F_{2aB}	N	15~100	160	400	2,075	7,500	4,650
使用壽命 Service Life	L_H	hr	15~100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
效率 Efficiency	η	%	15~100	≥ 94%				
使用溫度 Operating Temperature		°C	15~100	-25°C ~ +90°C				
潤滑 Lubrication			15~100	全合成潤滑油脂 Synthetic Grease				
防護等級 Protection Class			15~100	IP 65				
安裝方向 Mounting Position			15~100	任意方向 Any				
噪音值 Noise Level		dB	15~100	≤ 60 dB	≤ 60 dB	≤ 63 dB	≤ 63 dB	≤ 65 dB
重量 Weight ±2%		Kg	15~100	1.05	2.2	4.48	9.84	18.5

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

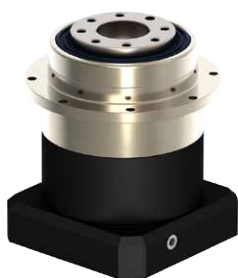
速比 Ratio	50	70	90	120	160
15	0.03	0.13	0.13	0.47	2.63
20	0.03	0.13	0.13	0.47	2.63
25	0.03	0.13	0.13	0.47	2.63
30	0.03	0.13	0.13	0.47	2.43
35	0.03	0.13	0.13	0.47	2.43
40	0.03	0.13	0.13	0.47	2.43
50	0.03	0.13	0.13	0.44	2.43
70	0.03	0.13	0.13	0.44	2.39
100	0.03	0.13	0.13	0.44	2.39

Indication of Model Numbers

機種型號表示

SD	90	10			P1	MOTOR
減速機型 Type	型號 Model	速比 Ratio	出力軸承形式 Output Bearing	入力軸鍵槽 Input Shaft	背隙等級 Backlash Class	馬達型號 Motor Type
SD	47	單段 1-Stage	☐ 標準品， 滾珠軸承 Standard (Ball Bearing)	☐ 無鍵槽 No Keyway	Ps	
SDL	64	4, 5, 7, 10			P0	
SDD	90	雙段 2-Stage	(Ball Bearing)	K: 有鍵槽 Keyway	P1	
SDH	110	20, 25, 35, 40, 50, 70, 100	(47#~255#)	(140#~255#)	P2	
	140	單段 1-Stage (SDL)	T: 滾錐軸承 Taper Bearing			
	200	4, 5, 7, 10, 14, 20	(90#~255#)			
	255	雙段 2-Stage (SDL)				
		20, 25, 35, 40, 50, 70, 100, 140, 200				
		雙段 2-Stage (SDH)				
		20, 25, 35, 50, 70, 100, 150				

SD



SDL



SDD

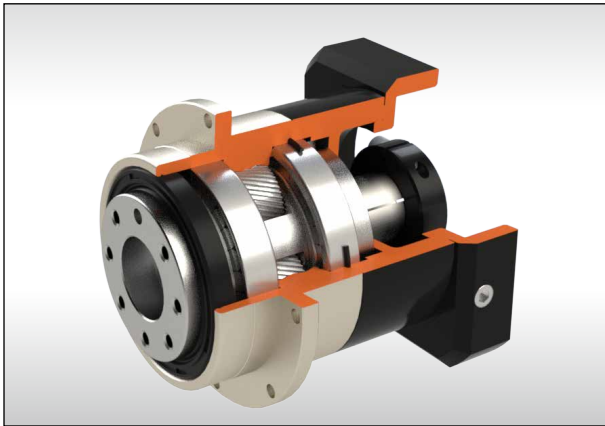


SDH



Features of SD / SDD / SDH Series

SD / SDD / SDH 系列產品特點

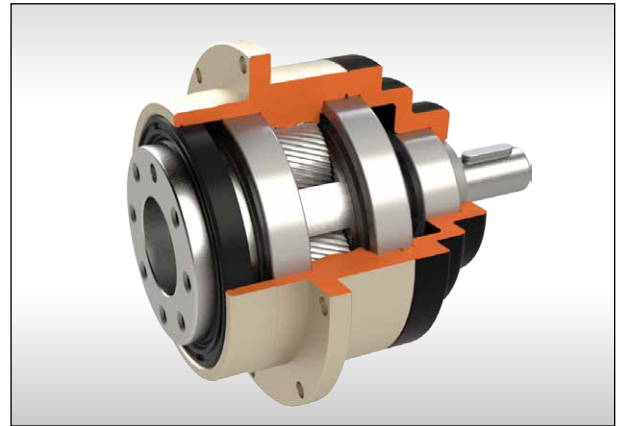


可彈性選擇軸承

標準品使用雙大滾珠軸承。也可以選用雙滾錐軸承，以達到最大的扭轉剛性及高軸向、高徑向負載。

Optional Bearings

Standard products use double large ball bearings. Double tapered bearings can also be used to achieve maximum torsional rigidity and high axial and radial loads.

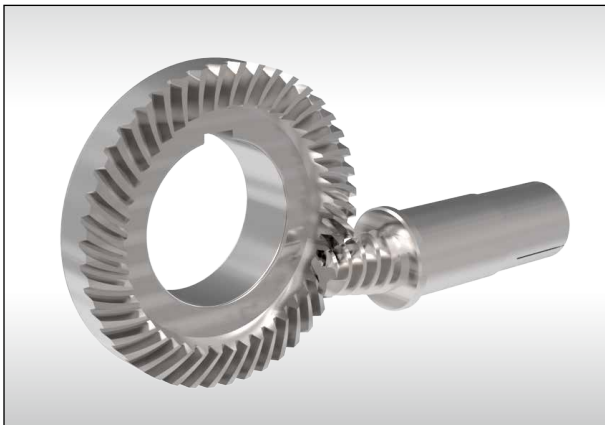


入力軸多種方式傳動

SDD 機種實心入力軸設計，方便使用皮帶輪，聯軸器等傳動方式。

Various Transmissions Mode at the input shaft

SDD models are designed with solid shafts to facilitate the use of pulleys, couplings and other transmission methods.



直交軸型減速機

入力端除了使用螺旋傘齒輪之外 (SDL)，也可以選擇戟齒齒輪 (SDH)，在有限的空間內，獲得更大的減速比。

Right Angle Reducer

In addition to the use of spiral bevel gears (SDL), hypoid gears (SDH) can also be selected to obtain a larger reduction ratio in a limited space.



一體式的行星臂架及雙懸臂設計

行星臂架與輸出軸採一體式的結構設計，以確保提高扭轉剛性及精確度。並使用一次加工完成，控制精度在公差之內。

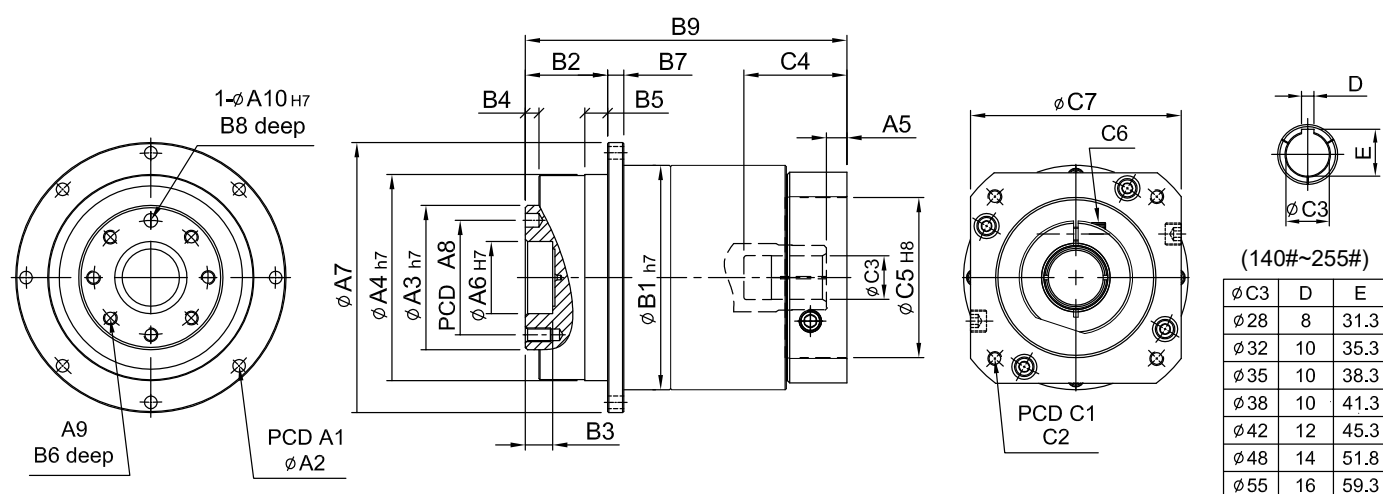
Integrated Planetary Arm Bracket

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy. The entire structure is one-time machined for controlling accuracy in the specified tolerance.

MODEL : SD

單段 1-Stage

RATIO : 4, 5, 7, 10



unit: mm

A	Model Code	47	64	90	110	140	200	255
	A1	67	79	109	135	168	233	280
	A2	8-3.4	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
	A3	28	40	63	80	100	160	180
	A4	47	64	90	110	140	200	255
	A5	5	6	9、23.5	10、20	10	11.5、13.5	10.5、12.5
	A6	12	20	31.5	40	50	80	100
	A7	72	86	118	146	179	248	300
	A8	20	31.5	50	63	80	125	140
	A9	4 - M3 x P0.5	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x P2.0
A10	3	5	6	6	8	10	12	
B	B1	59	70	98	125	156	212	255
	B2	19.5	19.5	30	29	38	50	66
	B3	5	7	12	12	12	16	20
	B4	3	4	6	6	6	8	12
	B5	5	6	10	10	15	15	20
	B6	6.5	8	12	12	16	22	32
	B7	4	5	7	8	10	12	18
	B8	4	6	6	7	7	10	10
	B9	74.7	84.5、92.5	133、147.5	153、173	186.5	250.5、252.5	263、265
C	C1	46、60、63	70、75、90	90、100、115、145	115、145、165	145、165、215	200、215、265	200、265、300
	C2	M3、M4、M5	M4、M5、M6	M5、M6、M8	M6、M8、M10	M8、M10、M12	M10、M12、M16	M12、M16
	C3	8、11	11、14、16、19	16、19、22、24	24、28、32、35	28、32、35、38	35、38、42、48、55	38、42、48、55
	C4	32	34、41.5	58.5、73	67、82	84.5	114.5、116.5	115.5、117.5
	C5	30、40、50	50、60、70	70、80、95、110	95、110、130	110、130、180	114.3、180、230	114.3、230、250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46、55	64、70、80	92、110、130	122、130、150	146、150、190	182、200、250	222、250、265

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	47	64	90	110	140	200	255
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	4	22	60	160	335	650	1,200	2,020
			5	20	50	155	333	618	1,189	2,010
			7	19	47	142	309	573	1,108	1,870
			10	16	43	136	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	4 ~ 10	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	4 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	4 ~ 10	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	4 ~ 10	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	4 ~ 10	-	-	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
背隙 Backlash P0		arcmin	4 ~ 10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P1		arcmin	4 ~ 10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P2		arcmin	4 ~ 10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
扭轉剛性 Torsional Rigidity		Nm/arcmin	4 ~ 10	6	14	30	86	155	450	1126
容許徑向力 Max. Radial Force 滾珠軸承 Ball Bearing	F_{2rB}	N	4 ~ 10	2,040	2,520	8,460	12,720	14,070	35,200	39,600
容許軸向力 Max. Axial Force 滾珠軸承 Ball Bearing	F_{2aB}	N	4 ~ 10	1,020	1,260	4,230	6,360	7,035	17,600	19,800
容許徑向力 Max. Radial Force 滾錐軸承 Taper Bearing	F_{2rB}	N	4 ~ 10	-	-	14,660	23,000	37,200	73,600	107,200
容許軸向力 Max. Axial Force 滾錐軸承 Taper Bearing	F_{2aB}	N	4 ~ 10	-	-	7,330	11,500	18,600	36,800	53,600
最大傾斜力矩 Max. Tilting Moment 滾珠軸承 Ball Bearing ※	M_{2K}	Nm	4 ~ 10	31	98	185	320	940	2,200	4,300
最大傾斜力矩 Max. Tilting Moment 滾錐軸承 Taper Bearing ※	M_{2K}	Nm	4 ~ 10	-	-	280	480	1,400	3,300	6,480
使用壽命 Service Life	L_H	hr	4 ~ 10	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	4 ~ 10	≥ 97%						
使用溫度 Operating Temperature		°C	4 ~ 10	- 25° C ~ + 90° C						
潤滑 Lubrication			4 ~ 10	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			4 ~ 10	IP65						
安裝方向 Mounting Position			4 ~ 10	任意方向 Any						
噪音值 Noise Level		dB	4 ~ 10	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	4 ~ 10	0.7	1.4	4.2	7.4	13.9	32.4	55

※Applied to the output shaft center at 100 rpm.

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

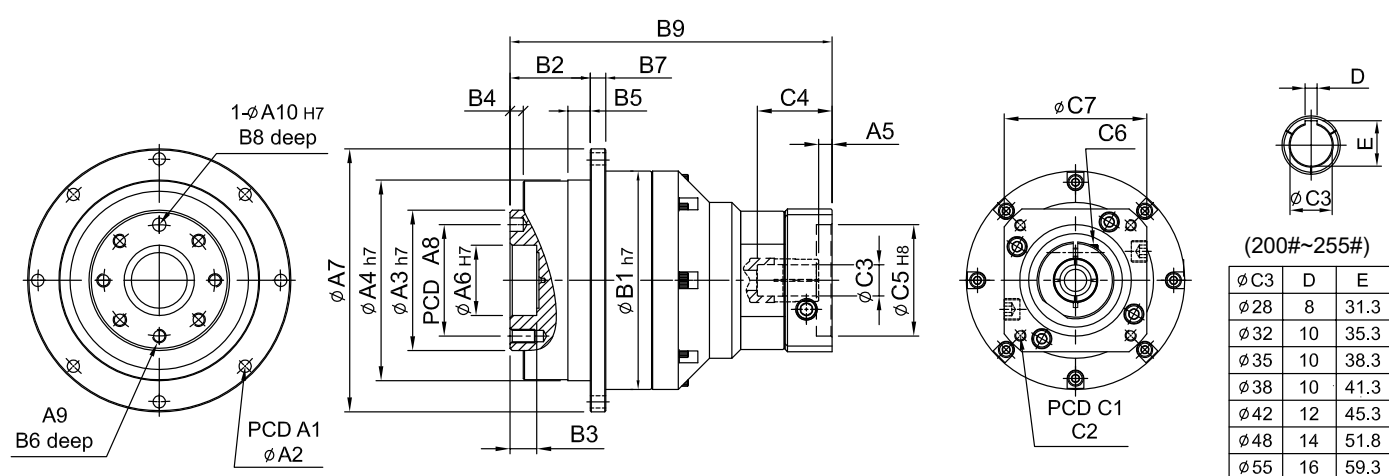
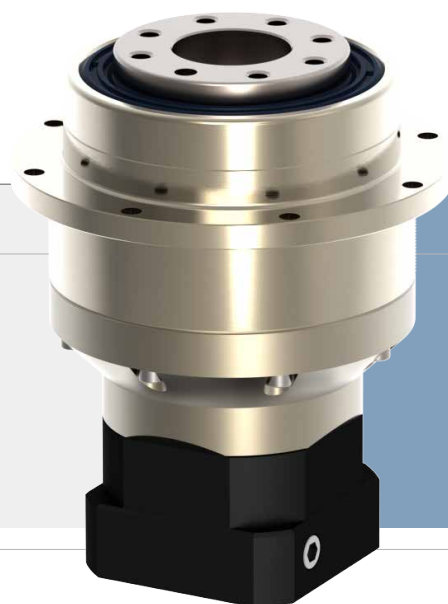
Ratio	47	64	90	110	140	200	255
4	0.03	0.13	0.47	2.75	7.46	24.00	55
5	0.03	0.12	0.45	2.70	7.41	23.23	53.19
7	0.03	0.12	0.45	2.64	7.12	22.11	50.78
10	0.03	0.12	0.43	2.56	7.01	22.21	50.50

SERVOBOX Planetary Reducers

MODEL : SD

雙段 2-Stage

RATIO : 20, 25, 35, 40, 50, 70, 100



unit: mm

	Model Code	47	64	90	110	140	200	255
A	A1	67	79	109	135	168	233	280
	A2	8-3.4	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
	A3	28	40	63	80	100	160	180
	A4	47	64	90	110	140	200	255
	A5	5	5	6	9·23	10·20	10	11.5·13.5
	A6	12	20	31.5	40	50	80	100
	A7	72	86	118	146	179	248	300
	A8	20	31.5	50	63	80	125	140
	A9	4 - M3 x P0.5	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x P2.0
	A10	3	5	6	6	8	10	12
B	B1	59	70	98	125	156	212	255
	B2	19.5	19.5	30	29	38	50	66
	B3	5	7	12	12	12	16	20
	B4	3	4	6	6	6	8	12
	B5	5	6	10	10	15	15	20
	B6	6.5	8	12	12	16	22	32
	B7	4	5	7	8	10	12	16
	B8	4	6	6	7	7	10	10
	B9	100.7	109	144.5·152.5	189·203.5	224.5·234.5·244.5	290.5	349·351
	B10	100.7	109	144.5·152.5	189·203.5	224.5·234.5·244.5	290.5	349·351
C	C1	46·60·63	46·60·63	70·75·90	90·100·115·145	115·145·165	145·165·215	200·215·265
	C2	M3·M4·M5	M3·M4·M5	M4·M5·M6	M5·M6·M8	M6·M8·M10	M8·M10·M12	M10·M12·M16
	C3	8·11	8·11	11·14·16·19	16·19·22·24	22·24·28·32·35	28·32·35·38	35·38·42·48·55
	C4	26	26·30.5	33.5·41.5	59·73.5	67·77·82	84.5	114.5·116.5
	C5	30·40·50	30·40·50	50·60·70	70·80·95·110	95·110·130	110·130·180	114.3·180·230
	C6	M4 x P0.7	M4 x P0.7	M5 x P1.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
	C7	46·55	46·55	64·70·80	92·110·130	122·130·150	146·150·190	182·200·250

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	47	64	90	110	140	200	255
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	20 25 35 40 50 70 100	22 20 19 22 20 19 16	60 50 47 60 50 47 43	160 155 142 160 155 142 136	335 333 309 335 333 309 294	650 618 573 650 618 573 549	1,200 1,189 1,108 1,200 1,189 1,108 1,059	2,020 2,010 1,870 2,020 2,010 1,870 1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	20 ~ 100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	20 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	20 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	20 ~ 100	6,000	6,000	6,000	6,000	5,000	5,000	4,000
背隙 Backlash Ps		arcmin	20 ~ 100	-	-	-	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P0		arcmin	20 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P1		arcmin	20 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P2		arcmin	20 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
扭轉剛性 Torsional Rigidity		Nm/arcmin	20 ~ 100	6	14	30	86	155	450	1,126
容許徑向力 Max. Radial Force 滾珠軸承 Ball Bearing	F_{2rB}	N	20 ~ 100	2,040	2,520	8,460	12,720	14,070	35,200	39,600
容許軸向力 Max. Axial Force 滾珠軸承 Ball Bearing	F_{2aB}	N	20 ~ 100	1,020	1,260	4,230	6,360	7,035	17,600	19,800
容許徑向力 Max. Radial Force 滾珠軸承 Taper Bearing	F_{2rB}	N	20 ~ 100	-	-	14,660	23,000	37,200	73,600	107,200
容許軸向力 Max. Axial Force 滾珠軸承 Taper Bearing	F_{2aB}	N	20 ~ 100	-	-	7,330	11,500	18,600	36,800	53,600
最大傾斜力矩 Max. Tilting Moment 滾珠軸承 Ball Bearing ※	M_{2K}	Nm	20 ~ 100	31	98	185	320	940	2,200	4,300
最大傾斜力矩 Max. Tilting Moment 滾珠軸承 Taper Bearing ※	M_{2K}	Nm	20 ~ 100	-	-	280	480	1,400	3,300	6,480
使用壽命 Service Life	L_{H1}	hr	20 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	20 ~ 100	≥ 94%						
使用溫度 Operating Temperature		°C	20 ~ 100	- 25° C ~ + 90° C						
潤滑 Lubrication			20 ~ 100	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			20 ~ 100	IP65						
安裝方向 Mounting Position			20 ~ 100	任意方向 Any						
噪音值 Noise Level		dB	20 ~ 100	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	20 ~ 100	1	1.9	4.8	9.4	16.7	40.12	64

※Applied to the output shaft center at 100 rpm.

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

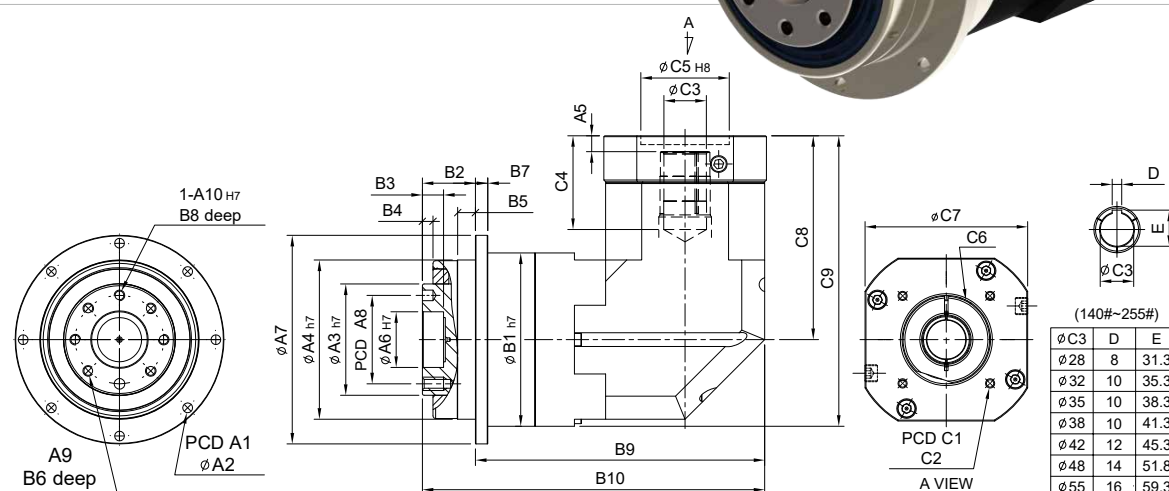
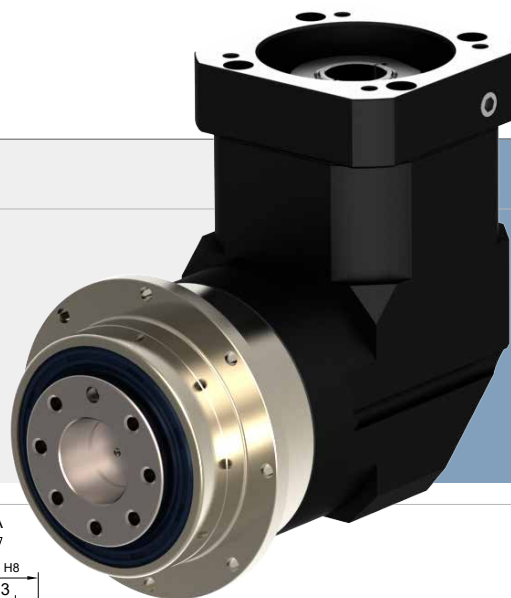
Ratio	47	64	90	110	140	200	255
20	0.03	0.03	0.15	0.45	2.7	7.22	23.22
25	0.03	0.03	0.15	0.45	2.7	7.22	23.22
35	0.03	0.03	0.15	0.45	2.7	7.22	23.22
40	0.03	0.03	0.15	0.45	2.7	7.22	23.22
50	0.03	0.03	0.14	0.4	2.6	7.05	23.07
70	0.03	0.03	0.14	0.4	2.6	7.05	23.07
100	0.03	0.03	0.14	0.4	2.6	7.01	22.67

SERVOBOX Planetary Reducers

MODEL : SDL

單段 1-Stage

RATIO : 4, 5, 7, 10, 14, 20



unit: mm

A	Model Code	47	64	90	110	140	200	255
	A1	67	79	109	135	168	233	280
	A2	8-3.4	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
	A3	28	40	63	80	100	160	180
	A4	47	64	90	110	140	200	255
	A5	6	6	9 · 23.5	10 · 20	10	12.5 · 14.5	12.5 · 14.5
	A6	12	20	31.5	40	50	80	100
	A7	72	86	118	146	179	248	300
	A8	20	31.5	50	63	80	125	140
	A9	4 - M3 x P0.5	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x P2.0
B	A10	3	5	6	6	8	10	12
	B1	59	70	98	125	156	212	255
	B2	19.5	19.5	30	29	38	50	66
	B3	5	7	12	12	12	16	20
	B4	3	4	6	6	6	8	12
	B5	5	6	10	10	15	15	20
	B6	6.5	8	12	12	16	22	32
	B7	4	5	7	8	10	12	18
	B8	4	6	6	7	7	10	10
	B9	84.2	105.5	163.6	203	227.5	313	332.5
C	B10	103.7	125	193.6	232	265.5	363	398.5
	C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265	200 · 265 · 300
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
	C3	8 · 9 · 11	11 · 14 · 19	16 · 19 · 22 · 24	24 · 28 · 32	32 · 35 · 38	35 · 38 · 42 · 48 · 55	38 · 42 · 48 · 55
	C4	27	33.5 · 42	53 · 67.5	67 · 77	85	132 · 134	132 · 134
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265
	C8	61	77 · 85	115.3 · 129.8	141 · 151	165.7	235 · 237	235 · 273
	C9	90.5	112 · 120	164.3 · 178.8	203.5 · 213.5	243.7	341 · 343	362 · 364

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	47	64	90	110	140	200	255
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	4 5 7 10 14 20	22 20 19 20 19 16	60 50 47 50 47 43	160 155 142 136 142 136	335 333 309 294 309 294	650 618 573 549 573 549	1,200 1,189 1,108 1,059 1,108 1,059	2,020 2,010 1,870 1,779 1,870 1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	4 ~ 20	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	4 ~ 20	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{IN}	rpm	4 ~ 20	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{IB}	rpm	4 ~ 20	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	4 ~ 20	-	-	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2
背隙 Backlash P0		arcmin	4 ~ 20	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P1		arcmin	4 ~ 20	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
背隙 Backlash P2		arcmin	4 ~ 20	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	4 ~ 20	6	14	30	86	155	450	1,126
容許徑向力 Max. Radial Force 滾珠軸承 Ball Bearing	F_{2rB}	N	4 ~ 20	2,040	2,520	8,460	12,720	14,070	35,200	39,600
容許軸向力 Max. Axial Force 滾珠軸承 Ball Bearing	F_{2aB}	N	4 ~ 20	1,020	1,260	4,230	6,360	7,035	17,600	19,800
容許徑向力 Max. Radial Force 滾錐軸承 Taper Bearing	F_{2rB}	N	4 ~ 20	-	-	14,660	23,000	37,200	73,600	107,200
容許軸向力 Max. Axial Force 滾錐軸承 Taper Bearing	F_{2aB}	N	4 ~ 20	-	-	7,330	11,500	18,600	36,800	53,600
最大傾斜力矩 Max. Tilting Moment 滾珠軸承 Ball Bearing ※	M_{2K}	Nm	4 ~ 20	31	98	185	320	940	2,200	4,300
最大傾斜力矩 Max. Tilting Moment 滾錐軸承 Taper Bearing ※	M_{2K}	Nm	4 ~ 20	-	-	280	480	1,400	3,300	6,480
使用壽命 Service Life	L_H	hr	4 ~ 20	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	4 ~ 20	≥ 95%						
使用溫度 Operating Temperature		°C	4 ~ 20	-25°C ~ +90°C						
潤滑 Lubrication			4 ~ 20	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			4 ~ 20	IP65						
安裝方向 Mounting Position			4 ~ 20	任意方向 Any						
噪音值 Noise Level		dB	4 ~ 20	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	4 ~ 20	1.1	2.3	6.9	13.4	23	80	90

※Applied to the output shaft center at 100 rpm.

 ■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

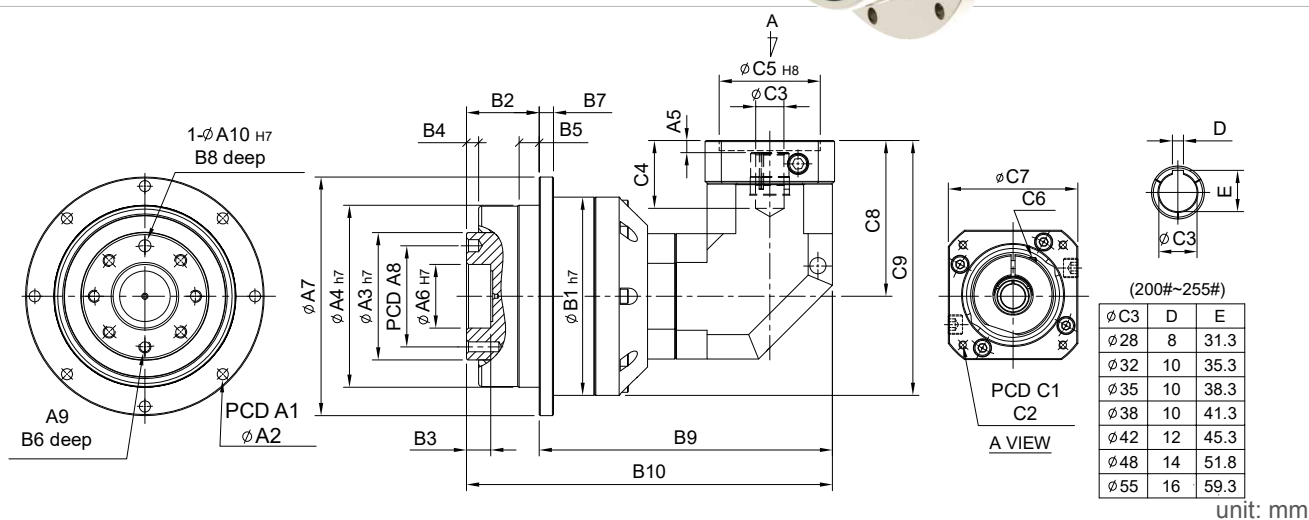
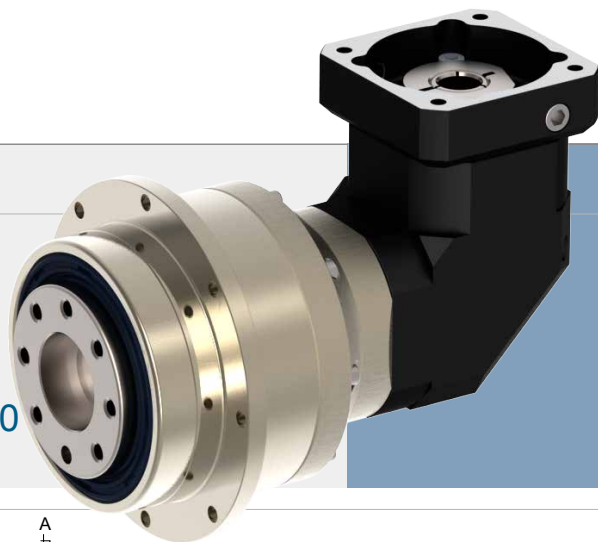
Ratio	47	64	90	110	140	200	255
4	0.09	0.36	2.28	6.85	23.5	68.1	134.8
5	0.09	0.36	2.28	6.85	23.5	68.1	134.8
7	0.09	0.36	2.28	6.85	23.5	68.1	134.8
10	0.09	0.36	2.28	6.85	23.5	68.1	134.8
14	0.03	0.08	1.88	6.2	21.8	66.5	120.2
20	0.03	0.08	1.88	6.2	21.8	66.3	118.8

SERVBOX Planetary Reducers

MODEL : SDL

雙段 2-Stage

RATIO : 20, 25, 35, 40, 50, 70, 100, 140, 200



	Model Code	Ratio						
		47	64	90	110	140	200	255
A	A1	67	79	109	135	168	233	280
	A2	8-3.4	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
	A3	28	40	63	80	100	160	180
	A4	47	64	90	110	140	200	255
	A5	6	6	9-23	9-23.5	10	12.5	12.5-14.5
	A6	12	20	31.5	40	50	80	100
	A7	72	86	118	146	179	248	300
	A8	20	31.5	50	63	80	125	140
	A9	4 - M3 x P0.5	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x P2.0
	A10	3	5	6	6	8	10	12
B	B1	59	70	98	125	156	212	255
	B2	19.5	19.5	30	29	38	50	66
	B3	5	7	12	12	12	16	20
	B4	3	4	6	6	6	8	12
	B5	5	6	10	10	15	15	20
	B6	6.5	8	12	12	16	22	32
	B7	4	5	7	8	10	12	16
	B8	4	6	6	7	7	10	10
	B9	110.2	118.5	151	210.6	254.5	308.5	379.1
	B10	129.7	138	181	239.6	292.5	358.5	445.1
C	C1	46-60-63	46-60-63	70-75-90	90-110-115-145	115-145-165	145-165-215	200-215-265
	C2	M3-M4-M5	M3-M4-M5	M4-M5-M6	M5-M6-M8-M10	M6-M8-M10	M8-M10-M12	M10-M12-M16
	C3	8-9-11	8-9-11	14-16-19	16-19-22-24	24-28-32	28-32-35-38	35-38-42-48-55
	C4	27	27	33.5-42	53-67.5	67-77	85	117-119
	C5	30-40-50	30-40-50	50-60-70	70-80-95-110	95-110-130	110-130-180	114.3-180-230
	C6	M4 x P0.7	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
	C7	46-55	46-55	64-70-80	92-110-130	122-130-150	146-150-190	182-200-250
	C8	61	61	77-85	115.3-129.8	141-151	165.7	235-237
	C9	90.5	96	126-134	177.8-192.3	219-229	271.7	362.5-364.5

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	47	64	90	110	140	200	255
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	20	22	60	160	335	650	1,200	2,020
			25	20	50	155	333	618	1,189	2,010
			35	19	47	142	309	573	1,108	1,870
			40	22	60	160	335	650	1,200	2,020
			50	20	50	155	333	618	1,189	2,010
			70	19	47	142	309	573	1,108	1,870
			100	16	43	136	294	549	1,059	1,779
			140	19	47	142	309	573	1,108	1,870
			200	16	43	136	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	20 ~ 200	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	20 ~ 200	3 倍額定輸出力矩 3 Times of Rated Output Torque						
急停扭矩 Emergency Stop Torque										
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	20 ~ 200	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	20 ~ 200	6,000	6,000	6,000	6,000	6,000	4,000	3,000
背隙 Backlash Ps		arcmin	20 ~ 200	-	-	-	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P0		arcmin	20 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P1		arcmin	20 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
背隙 Backlash P2		arcmin	20 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	20 ~ 200	6	14	30	86	155	450	1,126
容許徑向力 Max. Radial Force 滾珠軸承 Ball Bearing	F_{2rB}	N	20 ~ 200	2,040	2,520	8,460	12,720	14,070	35,200	39,600
容許軸向力 Max. Axial Force 滾珠軸承 Ball Bearing	F_{2aB}	N	20 ~ 200	1,020	1,260	4,230	6,360	7,035	17,600	19,800
容許徑向力 Max. Radial Force 滾珠軸承 Taper Bearing	F_{2rB}	N	20 ~ 200	-	-	14,660	23,000	37,200	73,600	107,200
容許軸向力 Max. Axial Force 滾珠軸承 Taper Bearing	F_{2aB}	N	20 ~ 200	-	-	7,330	11,500	18,600	36,800	53,600
最大傾斜力矩 Max. Tilting Moment 滾珠軸承 Ball Bearing ※	M_{2K}	Nm	20 ~ 200	31	98	185	320	940	2,200	4,300
最大傾斜力矩 Max. Tilting Moment 滾珠軸承 Taper Bearing ※	M_{2K}	Nm	20 ~ 200	-	-	280	480	1,400	3,300	6,480
使用壽命 Service Life	L_H	hr	20 ~ 200	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	20 ~ 200	≥ 92%						
使用溫度 Operating Temperature		°C	20 ~ 200	- 25° C ~ + 90° C						
潤滑 Lubrication			20 ~ 200	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			20 ~ 200	IP65						
安裝方向 Mounting Position			20 ~ 200	任意方向 Any						
噪音值 Noise Level		dB	20 ~ 200	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	20 ~ 200	1.4	2	6	11.8	22.3	48.5	97.5

※Applied to the output shaft center at 100 rpm.

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

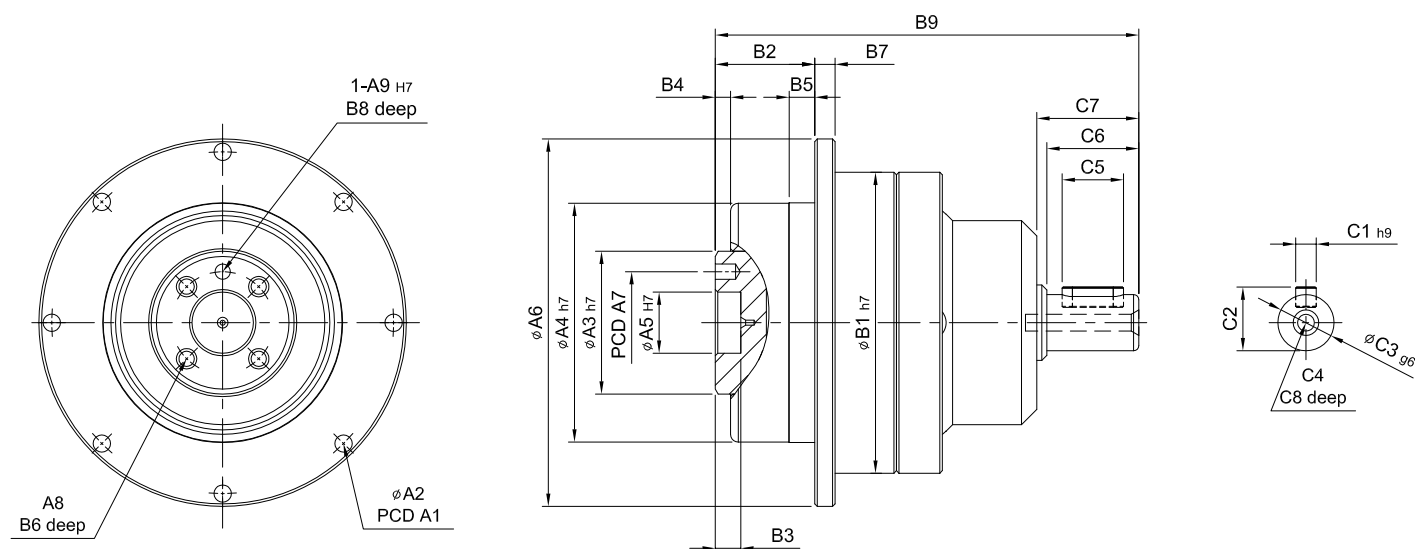
Ratio	47	64	90	110	140	200	255
20	0.09	0.36	2.28	6.85	23.5	22.8	68.2
25	0.09	0.36	2.28	6.85	23.5	22.8	68.2
35	0.09	0.36	2.28	6.85	23.5	22.8	68.2
40	0.09	0.36	2.28	6.85	23.5	22.8	68.2
50	0.09	0.36	2.28	6.85	23.5	22.8	68.2
70	0.09	0.36	2.28	6.85	23.5	22.8	68.2
100	0.09	0.36	2.28	6.85	23.5	22.8	68.2
140	0.03	0.08	1.88	6.2	21.8	21.1	64.9
200	0.03	0.08	1.88	6.2	21.8	21.1	64.9

SERVBOX Planetary Reducers

MODEL : SDD

單段 1-Stage

RATIO : 4, 5, 7, 10



unit: mm

	Model Code	47	64	90	110	140	200	255
A	A1	67	79	109	135	168	233	280
	A2	8-3.4	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
	A3	28	40	63	80	100	160	180
	A4	47	64	90	110	140	200	255
	A5	12	20	31.5	40	50	80	100
	A6	72	86	118	146	179	248	300
	A7	20	31.5	50	63	80	125	140
	A8	4 - M3 x P0.5	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x 2.0
	A9	3	5	6	6	8	10	12
B	B1	59	70	98	125	156	212	255
	B2	19.5	19.5	30	29	38	50	66
	B3	5	7	12	12	12	16	20
	B4	1.5	4	6	6	6	8	12
	B5	5	6	10	10	15	15	20
	B6	6.5	8	12	12	16	22	32
	B7	4	5	7	8	10	12	18
	B8	4	6	6	7	7	10	10
	B9	83	99	134	160	195	252	322.5
C	C1	4	5	5	6	10	12	16
	C2	12.5	16	18	24.5	35	43	59
	C3	11	14	16	22	32	40	55
	C4	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M12 x P1.75	M14 x P2.0	M16 x P2.0
	C5	12	20	20	30	40	50	75
	C6	18	24	28	36	50	60	85
	C7	20	26.3	31.5	40	54	65	90
	C8	8	10	12	16	24	28	32

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	47	64	90	110	140	200	255
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	4 5 7 10	22 20 19 16	60 50 47 43	160 155 142 136	335 333 309 294	650 618 573 549	1,200 1,189 1,108 1,059	2,020 2,010 1,870 1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	4 ~ 10	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	4 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	4 ~ 10	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	4 ~ 10	6,000	6,000	6,000	6,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	4 ~ 10	-	-	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
背隙 Backlash P0		arcmin	4 ~ 10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P1		arcmin	4 ~ 10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P2		arcmin	4 ~ 10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
扭轉剛性 Torsional Rigidity		Nm/arcmin	4 ~ 10	6	14	30	86	155	450	1,126
容許徑向力 Max. Radial Force 滾珠軸承 Ball Bearing	F_{2rB}	N	4 ~ 10	2,040	2,520	8,460	12,720	14,070	35,200	39,600
容許軸向力 Max. Axial Force 滾珠軸承 Ball Bearing	F_{2aB}	N	4 ~ 10	1,020	1,260	4,230	6,360	7,035	17,600	19,800
容許徑向力 Max. Radial Force 滾錐軸承 Taper Bearing	F_{2rB}	N	4 ~ 10	-	-	14,660	23,000	37,200	73,600	107,200
容許軸向力 Max. Axial Force 滾錐軸承 Taper Bearing	F_{2aB}	N	4 ~ 10	-	-	7,330	11,500	18,600	36,800	53,600
最大傾斜力矩 Max. Tilting Moment 滾珠軸承 Ball Bearing ※	M_{2K}	Nm	4 ~ 10	31	98	185	320	940	2,200	4,300
最大傾斜力矩 Max. Tilting Moment 滾錐軸承 Taper Bearing ※	M_{2K}	Nm	4 ~ 10	-	-	280	480	1,400	3,300	6,480
使用壽命 Service Life	L_H	hr	4 ~ 10	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	4 ~ 10	≥ 97%						
使用溫度 Operating Temperature		°C	4 ~ 10	- 25° C ~ + 90° C						
潤滑 Lubrication			4 ~ 10	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			4 ~ 10	IP65						
安裝方向 Mounting Position			4 ~ 10	任意方向 Any						
噪音值 Noise Level		dB	4 ~ 10	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	4 ~ 10	0.71	1.3	3.6	6.2	12	32	53

※Applied to the output shaft center at 100 rpm.

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

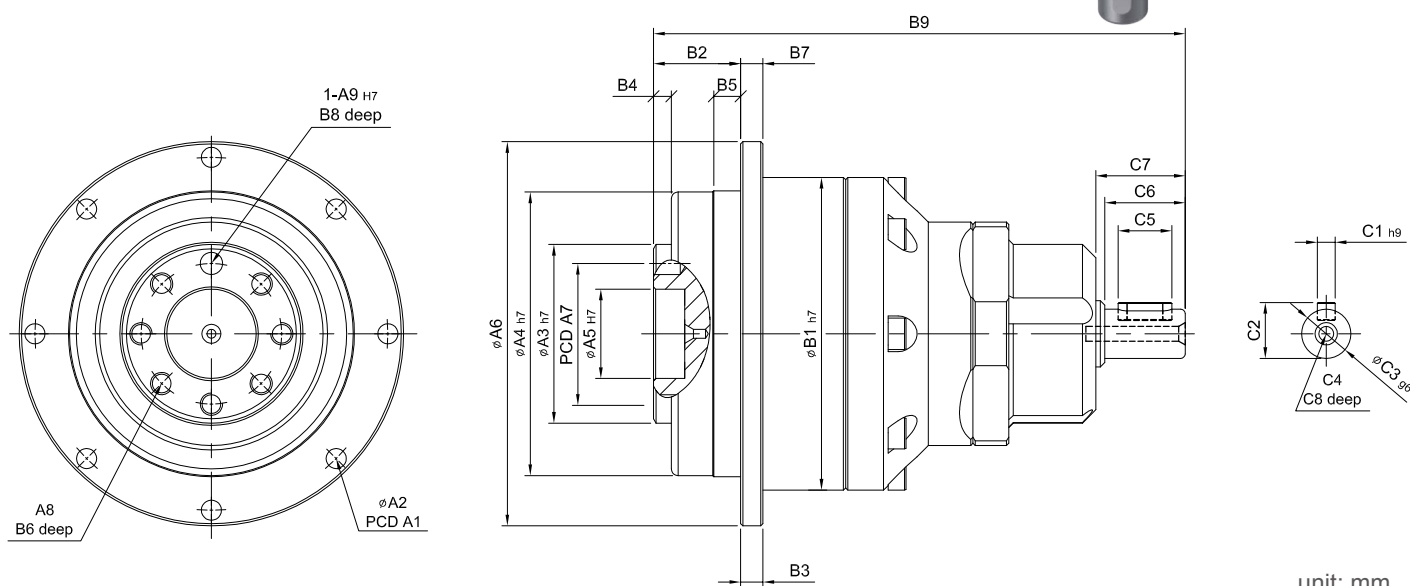
Ratio	47	64	90	110	140	200	255
4	0.03	0.13	0.47	2.75	7.46	24.00	55
5	0.03	0.12	0.45	2.70	7.41	23.23	53.19
7	0.03	0.12	0.45	2.64	7.12	22.11	50.78
10	0.03	0.12	0.43	2.56	7.01	22.21	50.50

SERVBOX Planetary Reducers

MODEL : SDD

雙段 2-Stage

RATIO : 20, 25, 35, 40, 50, 70, 100



unit: mm

	Model Code	47	64	90	110	140	200	255
A	A1	67	79	109	135	168	233	280
	A2	8-3.4	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
	A3	28	40	63	80	100	160	180
	A4	47	64	90	110	140	200	255
	A5	12	20	31.5	40	50	80	100
	A6	72	86	118	146	179	248	300
	A7	20	31.5	50	63	80	125	140
	A8	4 - M3 x P0.5	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x P2.0
B	A9	3	5	6	6	8	10	12
	B1	59	70	98	125	156	212	255
	B2	19.5	19.5	30	29	38	50	66
	B3	5	7	12	12	12	16	20
	B4	1.5	4	6	6	6	8	12
	B5	5	6	10	10	15	15	20
	B6	6.5	8	12	12	16	22	32
	B7	4	5	7	8	10	12	18
	B8	4	6	6	7	7	10	10
	B9	109	119	159	190	231.5	299	350.5
C	C1	4	4	5	5	6	10	12
	C2	12.5	12.5	16	18	24.5	35	43
	C3	11	11	14	16	22	32	40
	C4	M4 x P0.7	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M12 x P1.75	M14 x P2.0
	C5	12	12	20	20	30	40	50
	C6	18	18	24	28	36	50	60
	C7	20	20	26	31.5	40	54	65
	C8	8	8	10	12	16	24	28

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	47	64	90	110	140	200	255
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	20	22	60	160	335	650	1,200	2,020
			25	20	50	155	333	618	1,189	2,010
			35	19	47	142	309	573	1,108	1,870
			40	22	60	160	335	650	1,200	2,020
			50	20	50	155	333	618	1,189	2,010
			70	19	47	142	309	573	1,108	1,870
			100	16	43	136	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	20 ~ 100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	20 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	20 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	20 ~ 100	6,000	6,000	6,000	6,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	20 ~ 100	-	-	-	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P0		arcmin	20 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P1		arcmin	20 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P2		arcmin	20 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
扭轉剛性 Torsional Rigidity		Nm/arcmin	20 ~ 100	6	14	30	86	155	450	1,126
容許徑向力 Max. Radial Force 滾珠軸承 Ball Bearing	F_{2rB}	N	20 ~ 100	2,040	2,520	8,460	12,720	14,070	35,200	39,600
容許軸向力 Max. Axial Force 滾珠軸承 Ball Bearing	F_{2aB}	N	20 ~ 100	1,020	1,260	4,230	6,360	7,035	17,600	19,800
容許徑向力 Max. Radial Force 滾錐軸承 Taper Bearing	F_{2rB}	N	20 ~ 100	-	-	14,660	23,000	37,200	73,600	107,200
容許軸向力 Max. Axial Force 滾錐軸承 Taper Bearing	F_{2aB}	N	20 ~ 100	-	-	7,330	11,500	18,600	36,800	53,600
最大傾斜力矩 Max. Tilting Moment 滾珠軸承 Ball Bearing ※	M_{2K}	Nm	20 ~ 100	31	98	185	320	940	2,200	4,300
最大傾斜力矩 Max. Tilting Moment 滾錐軸承 Taper Bearing ※	M_{2K}	Nm	20 ~ 100	-	-	280	480	1,400	3,300	6,480
使用壽命 Service Life	L_H	hr	20 ~ 100	S5 周期運轉: >30,000 (S1 連續運轉: >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	20 ~ 100	≥ 94%						
使用溫度 Operating Temperature		°C	20 ~ 100	- 25° C ~ + 90° C						
潤滑 Lubrication			20 ~ 100	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			20 ~ 100	IP65						
安裝方向 Mounting Position			20 ~ 100	任意方向 Any						
噪音值 Noise Level		dB	20 ~ 100	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	20 ~ 100	1.15	1.7	4.25	8.5	14.95	37.2	69

※Applied to the output shaft center at 100 rpm.

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	47	64	90	110	140	200	255
20	0.03	0.03	0.15	0.45	2.7	7.22	23.22
25	0.03	0.03	0.15	0.45	2.7	7.22	23.22
35	0.03	0.03	0.15	0.45	2.7	7.22	23.22
40	0.03	0.03	0.15	0.45	2.7	7.22	23.22
50	0.03	0.03	0.14	0.4	2.6	7.05	23.07
70	0.03	0.03	0.14	0.4	2.6	7.05	23.07
100	0.03	0.03	0.14	0.4	2.6	7.01	22.67

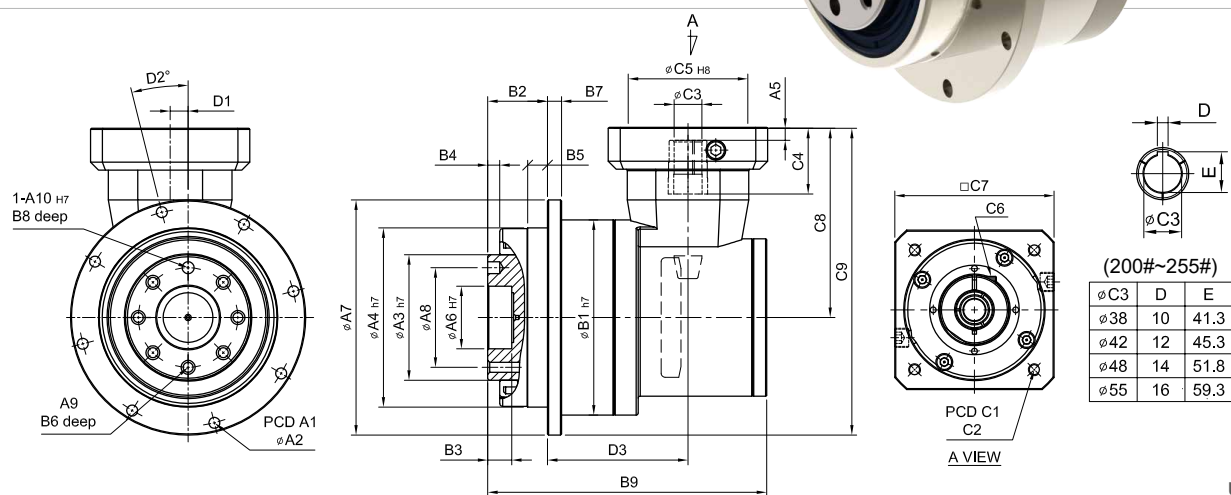
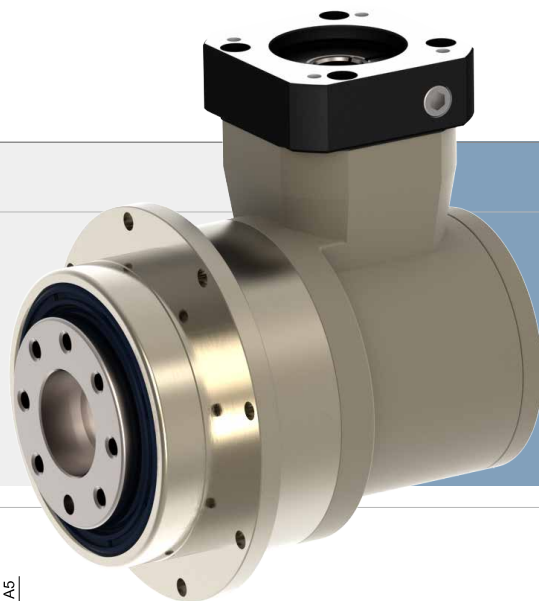
SERVOBOX Planetary Reducers

螺旋齒輪 Helical Gear & 戟齒輪 Hypoid Gear

MODEL : SDH

雙段 2-Stage

RATIO : 20, 25, 35, 50, 70, 100, 150



unit: mm

Model Code	64	90	110	140	200	255
A	A1	79	109	135	168	233
	A2	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0
	A3	40	63	80	100	160
	A4	64	90	110	140	200
	A5	5	6	10	10	13
	A6	20	31.5	40	50	80
	A7	86	118	146	179	248
	A8	31.5	50	63	80	125
	A9	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5
	A10	5	6	6	8	10
B	B1	70	98	125	156	212
	B2	19.5	30	29	38	50
	B3	7	12	12	12	16
	B4	4	6	6	6	8
	B5	6	10	10	15	15
	B6	8	12	12	16	22
	B7	5	7	8	10	12
	B8	6	6	7	7	10
	B9	96	140	168	202	273
	B10	12	12	12	12	12
C	C1	46·60·63	70·75·90	90·110·115·145	115·145·165	145·165·215
	C2	M3·M4·M5	M4·M5·M6	M5·M6·M8	M6·M8·M10	M8·M10·M12
	C3	8·9·11	14	19	32	38
	C4	26	33	45	67	85
	C5	30·40·50	50·60·70	70·80·95·110	95·110·130	110·130·180
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46·55	64·70·80	92·110·130	122·130·150	146·150·190
	C8	69	95.5	126.5	149	203
	C9	112	154.5	199.5	238.5	327
	C10	1/8"PT	1/8"PT	1/8"PT	1/4"PT	1/4"PT
D	D1	9	9	14	18	27
	D2	19	14	14	0	0
	D3	46.2	70.5	90	103.8	144

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	64	90	110	140	200	255
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	20	60	160	335	650	1,200	2,020
			25	50	155	333	618	1,189	2,010
			35	47	142	309	573	1,108	1,870
			50	43	136	294	549	1,059	1,779
			70	47	142	309	573	1,108	1,870
			100	43	136	294	549	1,059	1,779
			150	43	136	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	20 ~ 150	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	20 ~ 150	3 倍額定輸出力矩 3 Times of Rated Output Torque					
額定輸入轉速 Rated Input Speed	n_{IN}	rpm	20 ~ 150	3,000	3,000	3,000	3,000	2,000	2,000
最大輸入轉速 Max. Input Speed	n_{IB}	rpm	20 ~ 150	6,000	6,000	5,000	5,000	4,000	4,000
背隙 Backlash P0		arcmin	20 ~ 150	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P1		arcmin	20 ~ 150	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P2		arcmin	20 ~ 150	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
扭轉剛性 Torsional Rigidity		Nm/arcmin	20 ~ 150	14	30	86	155	450	1,126
容許徑向力 Max. Radial Force 滾珠軸承 Ball Bearing	F_{2rB}	N	20 ~ 150	2,520	8,460	12,720	14,070	35,200	39,600
容許軸向力 Max. Axial Force 滾珠軸承 Ball Bearing	F_{2aB}	N	20 ~ 150	1,260	4,230	6,360	7,035	17,600	19,800
容許徑向力 Max. Radial Force 滾錐軸承 Taper Bearing	F_{2rB}	N	20 ~ 150	-	14,660	23,000	37,200	73,600	107,200
容許軸向力 Max. Axial Force 滾錐軸承 Taper Bearing	F_{2aB}	N	20 ~ 150	-	7,330	11,500	18,600	36,800	53,600
最大傾斜力矩 Max. Tilting Moment 滾珠軸承 Ball Bearing ※	M_{2K}	Nm	20 ~ 150	98	185	320	940	2,200	4,300
最大傾斜力矩 Max. Tilting Moment 滾錐軸承 Taper Bearing ※	M_{2K}	Nm	20 ~ 150	-	280	480	1,400	3,300	6,480
使用壽命 Service Life	L_H	hr	20 ~ 150	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	20, 25, 35, 50 70, 100, 150	≥ 92% ≥ 90%					
使用溫度 Operating Temperature		°C	20 ~ 150	-25°C ~ +90°C					
潤滑 Lubrication			20 ~ 150	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			20 ~ 150	IP65					
安裝方向 Mounting Position			20 ~ 150	任意方向 Any					
噪音值 Noise Level		dB	20 ~ 150	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	20 ~ 150	1.7	4.7	9.2	17.4	38.8	61.7

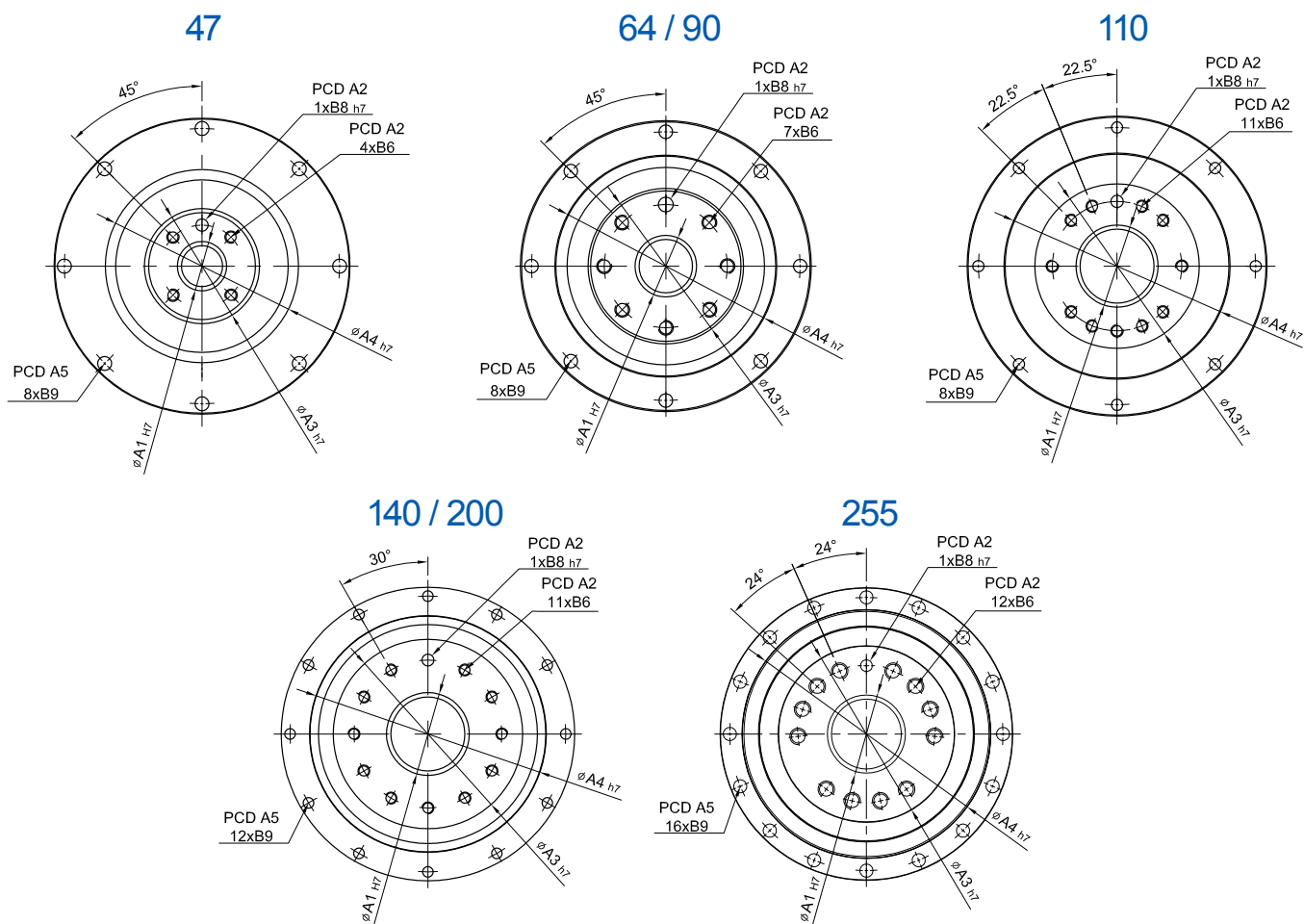
※Applied to the output shaft center at 100 rpm.

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	64	90	110	140	200	255
20	0.03	0.15	0.45	2.7	7.22	23.22
25	0.22	1.37	4.11	14.1	40.8	80.8
35	0.22	1.37	4.11	14.1	40.8	80.8
50	0.18	1.14	3.43	11.7	34.0	67.4
70	0.03	0.14	0.4	2.6	7.05	23.07
100	0.03	0.14	0.4	2.6	7.01	22.67
150	0.03	0.14	0.4	2.6	7.01	22.67

Output Frame Dimension of SD, SDL, SDD Series

SD、SDL、SDD 系列出力法蘭尺寸表



單段 1-Stage SD, SDL, SDD 雙段 2-Stage SD, SDL, SDD

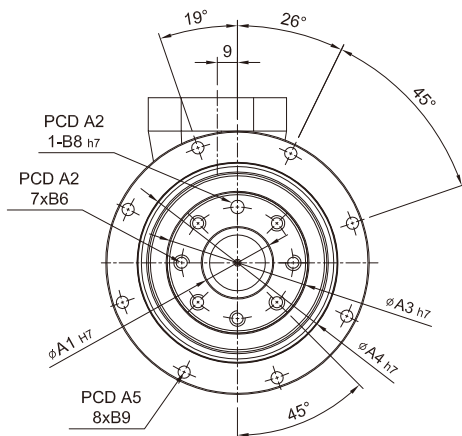
unit: mm

Model Code	47	64	90	110	140	200	255
A1	12	20	31.5	40	50	80	100
A2	20	31.5	50	63	80	125	140
A3	28	40	63	80	100	160	180
A4	47	64	90	110	140	200	255
A5	67	79	109	135	168	233	280
B6	M3 x P0.5	M5 x P0.8	M6 x P1	M6 x P1	M8 x P1.25	M10 x P1.5	M16 x P2
B8	3	5	6	6	8	10	12
B9	3.4	4.5	5.5	5.5	6.6	9	13.5

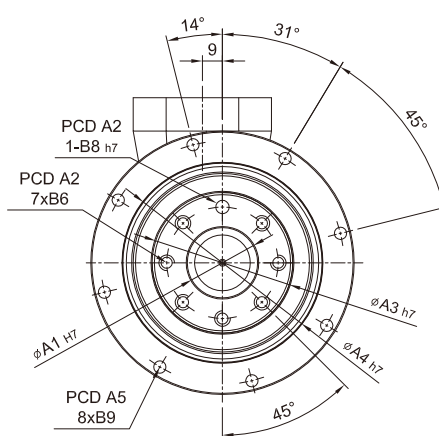
Output Frame Dimension of SDH Series

SDH 系列出力法蘭尺寸表

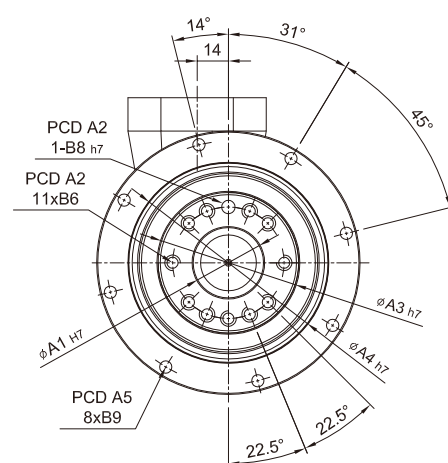
SDH64



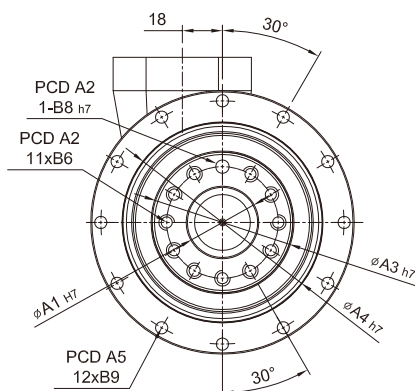
SDH90



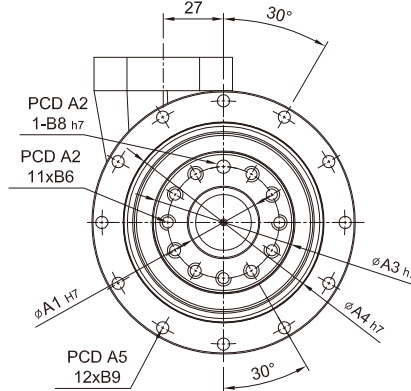
SDH110



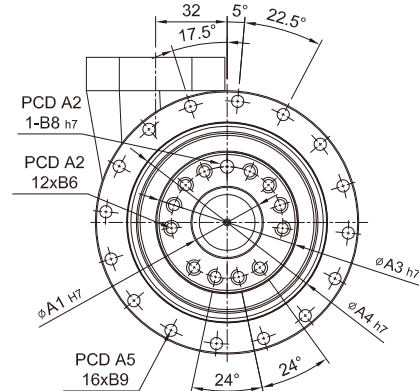
SDH140



SDH200



SDH255



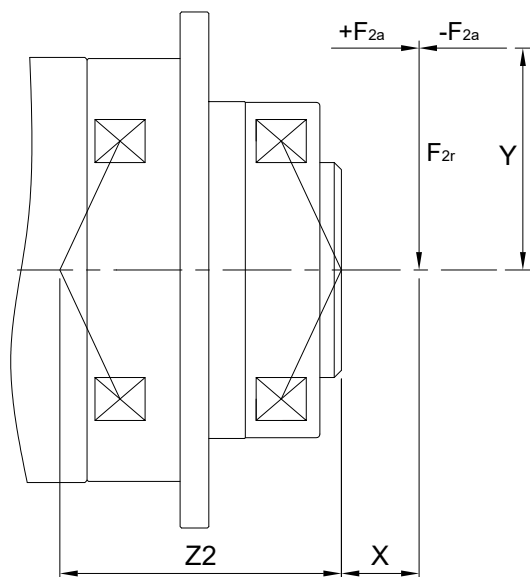
雙段 2-Stage SDH

unit: mm

Model Code	64	90	110	140	200	255	
A	A1	20	31.5	40	50	80	100
	A2	31.5	50	63	80	125	140
	A3	40	63	80	100	160	180
	A4	64	90	110	140	200	255
	A5	79	109	135	168	233	280
B	B6	M5 x P0.8	M6 x P1	M6 x P1	M8 x P1.25	M10 x P1.5	M16 x P2
	B8	5	6	6	8	10	12
	B9	4.5	5.5	5.5	6.6	9	13.5

Max. Tilting Moment M_{2K} of SD, SDL, SDD, SDH Series

SD、SDL、SDD、SDH 系列最大傾斜力矩



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

M_{2K} : [Nm]

F_{2a}, F_{2r} : [N]

$X, Y, Z2$: [mm]

unit: mm

Model		47	64	90	110	140	200	255
Code								
Z2	滾珠軸承 Ball Bearing	22.5	28	34	41	48	60	68
	滾錐軸承 Taper Bearing	-	-	50	60.6	77	98.8	114.5

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Indication of Model Numbers

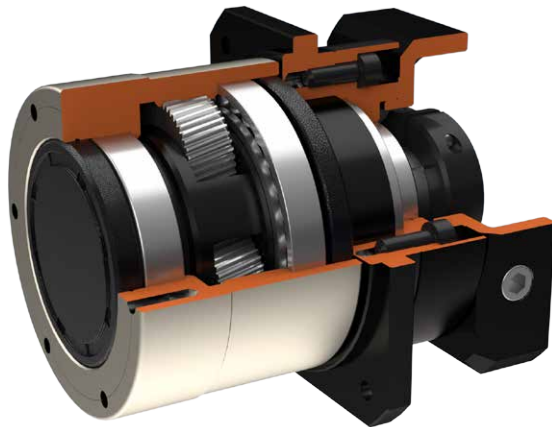
機種型號表示

SR	100	9	MOTOR
減速機型 Type	型號 Model	速比 Ratio	馬達型號 Motor Type
SR SRD	82 100 132	單段 1-Stage 2, 3, 4, 6, 9 雙段 2-Stage 10, 15, 20, 24, 30, 36, 40, 45, 60, 90	



Features of SR Series

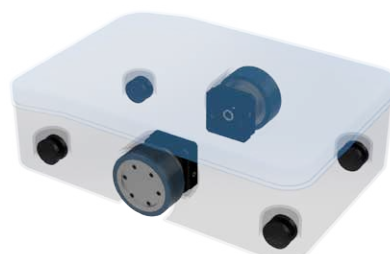
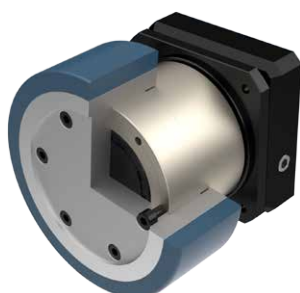
SR 系列產品特點



外轉式行星減速機由殼體直接傳動，節省使用空間。
The outer-rotating planetary reducer is directly driven by the housing, saving space.

Applications

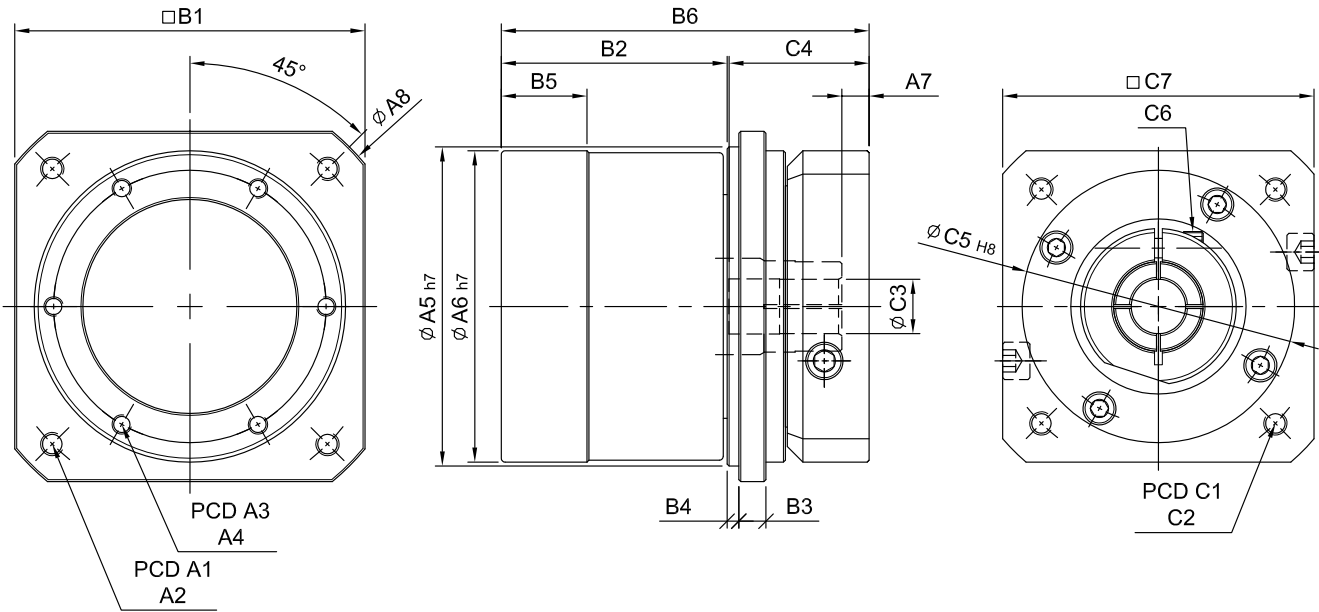
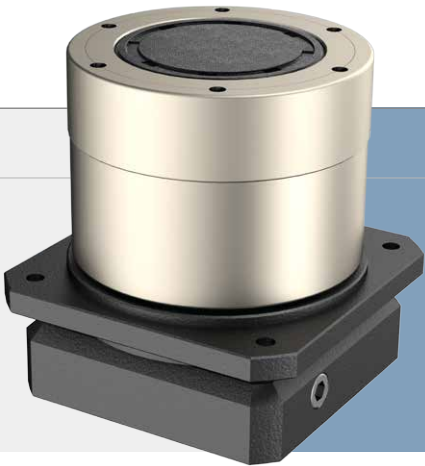
減速機應用範例



MODEL : SR

單段 1-Stage

RATIO : 2, 3, 4, 6, 9



unit: mm

	Model	82	100	132
	Code			
A	A1	100	122	166
	A2	M6 x P1.0	M8 x P1.25	M10 x P1.5
	A3	70	84	114
	A4	M5 x P0.8	M6 x P1.0	M8 x P1.25
	A5	82	100	132
	A6	80	96	128
	A7	7・9	8・17	11.5
	A8	116	139	184
B	B1	90	108	140
	B2	58	63	85.5
	B3	7	9.5	12
	B4	3	3.5	4
	B5	22	24	34
	B6	94.5	111.5	143
C	C1	85	115	130
	C2	M6 x P1.0	M6 x P1.0	M8 x P1.25
	C3	14・19	19・24	24・28
	C4	36・43	47・56	63.5
	C5	70	95	110
	C6	M5 x P0.8	M6 x P1.0	M8 x P1.25
	C7	80	110	130

High Precision Planetary Reducer

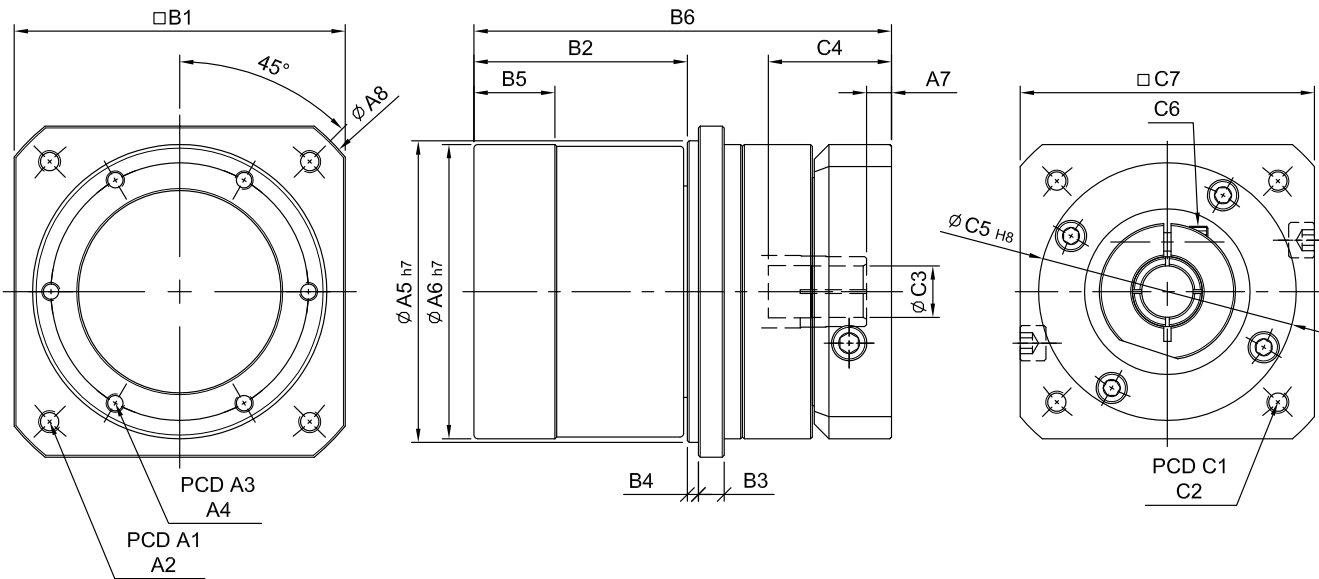
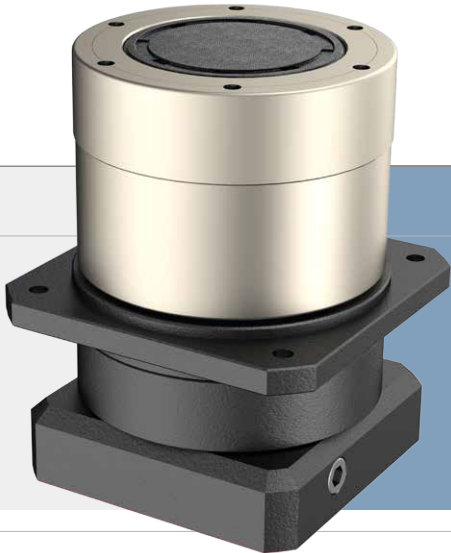
規格 Parameter	代號	單位 Unit	速比 Ratio	82	100	132
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	2	86	131	271
			3	82	122	243
			4	76	115	239
			6	72	111	232
			9	68	104	221
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	2 ~ 9	1.5 倍額定輸出力矩 1.5 Times of Rated Output Torque		
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	2 ~ 9	3 倍額定輸出力矩 3 Times of Rated Output Torque		
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	2 ~ 9	3,000		
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	2 ~ 9	6,000		
背隙 Backlash		arcmin	2 ~ 9	≤ 6	≤ 6	≤ 6
扭轉剛性 Torsional Rigidity		Nm/arcmin	2 ~ 9	10	14	27
容許徑向力 Max. Radial Force	F_{2rB}	N	2 ~ 9	3,000	3,400	7,200
容許軸向力 Max. Axial Force	F_{2aB}	N	2 ~ 9	1,500	1,700	3,600
使用壽命 Service Life	L_{IH}	hr	2 ~ 9	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)		
效率 Efficiency	η	%	2 ~ 9	≥ 97%		
使用溫度 Operating Temperature		°C	2 ~ 9	- 25° C ~ + 90° C		
潤滑 Lubrication			2 ~ 9	全合成潤滑油脂 Synthetic Grease		
防護等級 Protection Class			2 ~ 9	IP65		
安裝方向 Mounting Position			2 ~ 9	任意方向 Any		
噪音值 Noise Level		dB	2 ~ 9	≤ 60	≤ 62	≤ 64
重量 Weight ±3%		Kg	2 ~ 9	2.5	4	8.9

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	82	100	132
2~9	0.7	0.9	3.2

MODEL : SR

雙段 2-Stage
RATIO : 10, 15, 20, 24, 30, 36, 40, 45, 60, 90



unit: mm

	Model	82	100	132
	Code			
A	A1	100	122	166
	A2	M6 x P1.0	M8 x P1.25	M10 x P1.5
	A3	70	84	114
	A4	M5 x P0.8	M6 x P1.0	M8 x P1.25
	A5	82	100	132
	A6	80	96	128
	A7	7・9	8	8
	A8	116	139	184
B	B1	90	108	140
	B2	58	63	85.5
	B3	7	9.5	12
	B4	3	3.5	4
	B5	22	24	34
	B6	113.5	137	168
C	C1	85	115	145
	C2	M6 x P1.0	M6 x P1.0	M8 x P1.25
	C3	14・19	19	19・24
	C4	33.5・40.8	43.5	52
	C5	70	95	110
	C6	M5 x P0.8	M5 x P0.8	M8 x P1.25
	C7	80	110	130

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	82	100	132
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	10	86	131	271
			15	82	122	243
			20	76	115	239
			24	72	111	232
			30	72	111	232
			36	68	104	221
			40	76	115	239
			45	68	104	221
			60	72	111	232
			90	68	104	221
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	10 ~ 90	1.5 倍額定輸出力矩 1.5 Times of Rated Output Torque		
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	10 ~ 90	3 倍額定輸出力矩 3 Times of Rated Output Torque		
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	10 ~ 90	3,000		
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	10 ~ 90	6,000		
背隙 Backlash		arcmin	10 ~ 90	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	10 ~ 90	10	14	27
容許徑向力 Max. Radial Force	F_{2rB}	N	10 ~ 90	3,000	3,400	7,200
容許軸向力 Max. Axial Force	F_{2aB}	N	10 ~ 90	1,500	1,700	3,600
使用壽命 Service Life	L_{IH}	hr	10 ~ 90	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)		
效率 Efficiency	η	%	10 ~ 90	≥ 94%		
使用溫度 Operating Temperature		°C	10 ~ 90	- 25° C ~ + 90° C		
潤滑 Lubrication			10 ~ 90	全合成潤滑油脂 Synthetic Grease		
防護等級 Protection Class			10 ~ 90	IP65		
安裝方向 Mounting Position			10 ~ 90	任意方向 Any		
噪音值 Noise Level		dB	10 ~ 90	≤ 60	≤ 62	≤ 64
重量 Weight ±3%		Kg	10 ~ 90	2.8	4.6	10.1

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	82	100	132
10~90	0.3	0.5	0.8

Indication of Model Numbers

機種型號表示

SF	142	10			P1	MOTOR
減速機型 Type	型號 Model	速比 Ratio	出力軸鍵槽 Output Shaft	入力軸鍵槽 Input Shaft	背隙等級 Backlash Class	馬達型號 Motor Type
SF	62	單段 1-Stage	☐ 標準品， 有鍵槽	☐ 無鍵槽	Ps	
SF-A	75	3, 4, 5, 6, 7, 8, 9, 10	有鍵槽	No Keyway	P0	
SFL	100		Standard (Keyway)	K: 有鍵槽	P1	
SFL-A	142	雙段 2-Stage		Keyway (142#~220#)	P2	
	180	15 ~ 100	N: 實心軸， 無鍵槽			
	220	單段 1-Stage (SFL)	Solid Output Shaft (No Keyway)			
		3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20				
		雙段 2-Stage (SFL)				
		15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100, 120, 140, 160, 180, 200				

SF



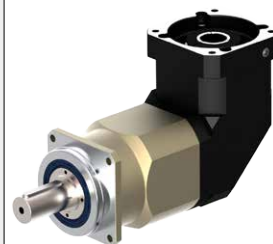
SF-A



SFL

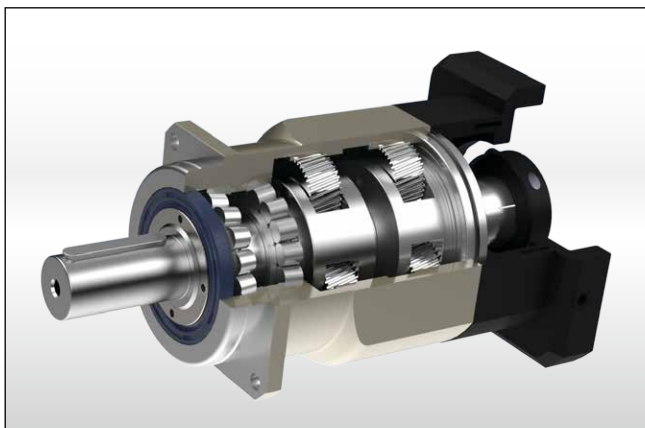


SFL-A



Features of SF Series

SF 系列產品特點

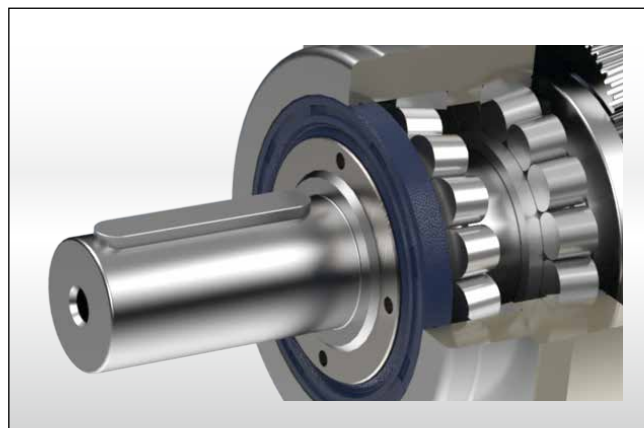


一體式的行星臂架及雙懸臂設計

行星臂架與輸出軸採一體式的結構設計，以確保提高扭轉剛性及精確度。

Integrated Planetary Arm Bracket

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy.

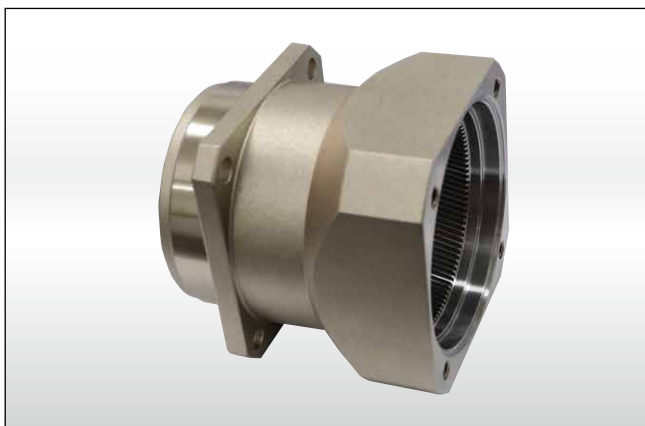


雙滾錐軸承設計

可同時承受高徑向負荷與軸向負荷。
結構強度比單一軸承設計更佳。

Double Tapered Bearing Design

Can withstand both high radial and axial loads.
Better structural strength than single bearing design.



一體式螺旋內齒輪箱

齒輪箱和內環齒輪採一體式的設計，減速機構採用螺旋齒輪設計，齒形嚙合率為一般正齒輪的二倍以上，具有運轉平順、低噪音、高輸出扭矩和低背隙的特性。

One-piece Helical Gear Box

The gear box and internal ring gear are one-piece constructed. The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also has features of extremely smooth running, low noise, high output torque and low backlash.



滿針滾針軸承設計

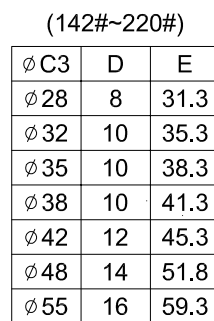
行星齒輪的傳動介面採用不含保持器之滿針滾針軸承，增加接觸面積以提高結構剛性及使用壽命。

Full Needle Roller Bearings Design

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.



RATIO : 3, 4, 5, 6, 7, 8, 9, 10



96

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62	75	100	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	59	165	216	625	1,206	2,030
			4	51	146	208	555	1,069	1,804
			5	48	155	333	618	1,189	2,010
			6	45	150	315	583	1,118	1,911
			7	45	142	309	573	1,108	1,870
			8	43	141	305	553	1,070	1,824
			9	44	140	293	516	993	1,694
			10	43	136	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 10	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque					
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 10	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 10	6,000	6,000	6,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	3 ~ 10	-	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
背隙 Backlash P0		arcmin	3 ~ 10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P1		arcmin	3 ~ 10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P2		arcmin	3 ~ 10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 10	8	15	27	60	150	240
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 10	2,240	4,150	8,760	12,750	17,860	57,000
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 10	1,920	3,780	7,500	10,840	15,180	34,000
使用壽命 Service Life	L_H	hr	3 ~ 10	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	3 ~ 10	$\geq 97\%$					
使用溫度 Operating Temperature		°C	3 ~ 10	- 25° C ~ + 90° C					
潤滑 Lubrication			3 ~ 10	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			3 ~ 10	IP65					
安裝方向 Mounting Position			3 ~ 10	任意方向 Any					
噪音值 Noise Level		dB	3 ~ 10	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight $\pm 3\%$		Kg	3 ~ 10	1.7	4.5	8.3	16.7	34.3	

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

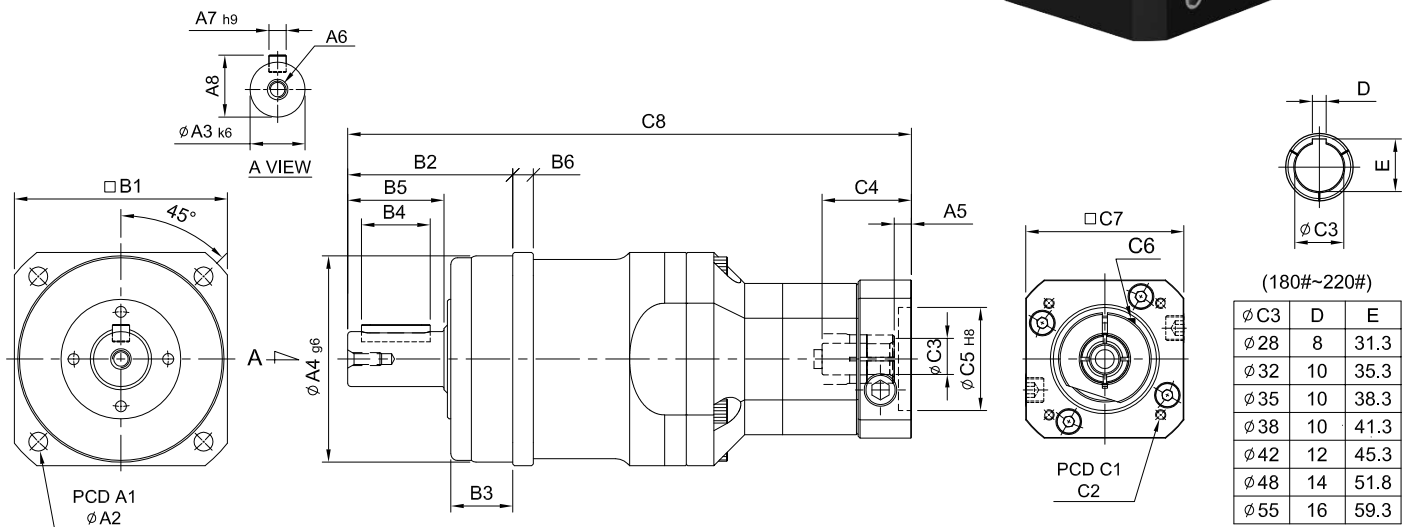
速比 Ratio	62	75	100	142	180	220
3	0.15	0.60	3.21	9.18	28.82	60.6
4	0.14	0.51	2.80	7.51	23.56	55.4
5	0.13	0.45	2.71	7.40	23.74	54.3
6	0.13	0.45	2.65	7.15	22.65	53.8
7	0.12	0.42	2.54	7.15	22.40	53.3
8	0.12	0.42	2.51	7.01	22.35	53.1
9	0.12	0.42	2.51	7.01	22.35	52.8
10	0.12	0.42	2.51	7.01	22.35	52.0

SERVOBOX Planetary Reducers

MODEL : SF

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100



unit: mm							
A	Model Code	62	75	100	142	180	220
	A1	68	85	120	165	215	250
	A2	5.5	6.8	9	11	13	17
	A3	16	22	32	40	55	75
	A4	60	70	90	130	160	180
	A5	5	6	9	10	10	11.5 · 13.5
	A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	6	10	12	16	20
B	A8	18	24.5	35	43	59	79.5
	B1	62	76	106	142	180	220
	B2	48	56	88	112	112	138
	B3	18	18	27	27	26	30
	B4	20	32	50	70	70	90
	B5	28	36	58	82	82	105
C	B6	6	7	10	12	15	20
	C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12
	C3	8 · 9 · 11	11 · 14 · 16 · 19	16 · 19 · 22 · 24	22 · 24 · 28 · 32	28 · 32 · 35 · 38	35 · 38 · 42 · 48 · 55
	C4	26	33.5 · 41.5	59	67	84.5	114.5 · 116.5
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250
	C8	164	198.8 · 206.8	278	344	395	487 · 491

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62	75	100	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	59	165	216	625	1,206	2,030
			20	51	146	208	555	1,069	1,804
			25	48	155	333	618	1,189	2,010
			30	45	150	315	583	1,118	1,911
			35	45	142	309	573	1,108	1,870
			40	51	146	208	555	1,070	1,824
			50	48	155	333	618	1,189	2,010
			60	45	150	315	583	1,118	1,911
			70	45	142	309	573	1,108	1,870
			80	43	141	305	553	1,070	1,824
			90	44	140	293	516	993	1,694
			100	43	136	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque					
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	15 ~ 100	-	-	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P0		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P1		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P2		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	8	15	27	60	150	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	2,240	4,150	8,760	12,750	17,860	57,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	1,920	3,780	7,500	10,840	15,180	34,000
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	15 ~ 100	≥ 94%					
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C					
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			15 ~ 100	IP65					
安裝方向 Mounting Position			15 ~ 100	任意方向 Any					
噪音值 Noise Level		dB	15 ~ 100	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	15 ~ 100	2.52	4.8	8.48	19.98	37.3	

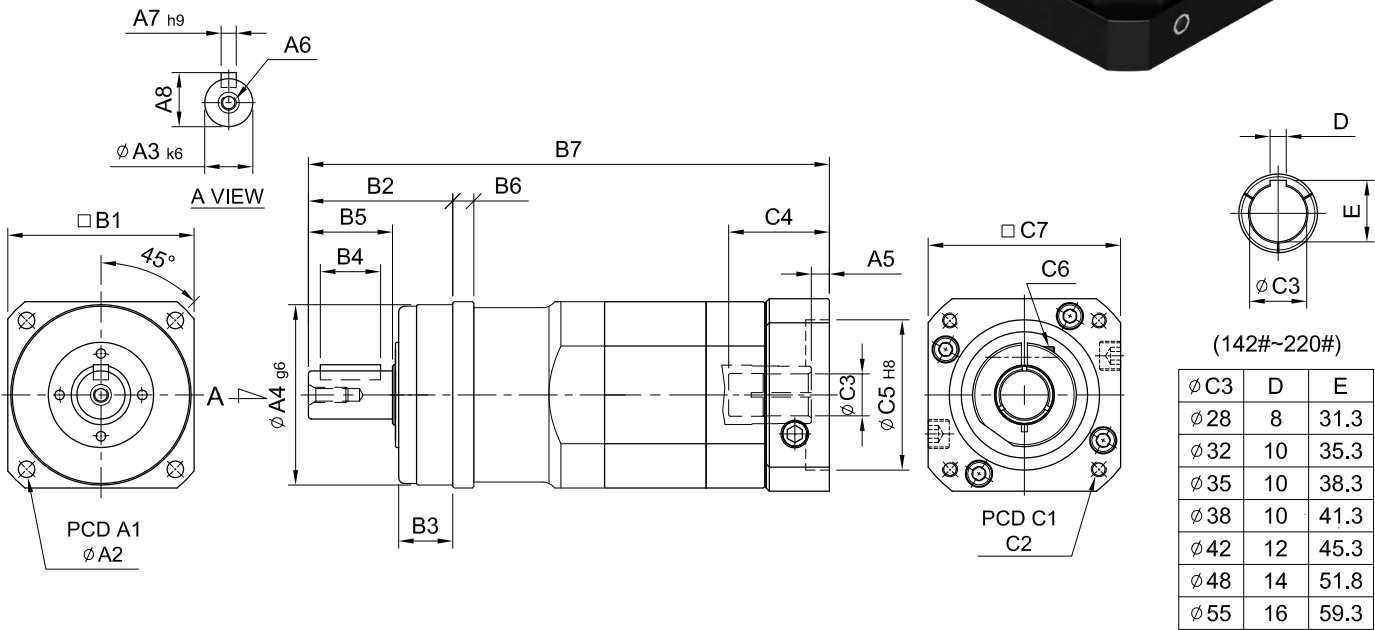
 ■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

速比 Ratio	62	75	100	142	180	220
15	0.03	0.13	0.47	2.63	7.30	22.8
20	0.03	0.13	0.47	2.63	7.30	22.8
25	0.03	0.13	0.47	2.63	7.10	22.8
30	0.03	0.13	0.47	2.43	7.10	22.8
35	0.03	0.13	0.47	2.43	7.10	22.8
40	0.03	0.13	0.47	2.43	6.92	22.8
50	0.03	0.13	0.44	2.43	6.92	22.8
60	0.03	0.13	0.44	2.39	6.72	22.2
70	0.03	0.13	0.44	2.39	6.72	22.2
80	0.03	0.13	0.44	2.39	6.72	22.1
90	0.03	0.13	0.44	2.39	6.72	22.1
100	0.03	0.13	0.44	2.39	6.72	22.1

SERVOBOX Planetary Reducers

MODEL : SF-A

雙段 2-Stage
RATIO : 15, 20, 25, 30, 35, 40, 50, 70, 100



	Model	62A	75A	100A	142A	180A	220A
	Code						
A	A1	68	85	120	165	215	250
	A2	5.5	6.8	9	11	13	17
	A3	16	22	32	40	55	75
	A4	60	70	90	130	160	180
	A5	6	8	10.5	10	11.5、13.5	12.5、14.5
	A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	6	10	12	16	20
	A8	18	24.5	35	43	59	79.5
B	B1	62	76	106	142	180	220
	B2	48	56	88	112	112	138
	B3	18	18	27	27	26	30
	B4	20	32	50	70	70	90
	B5	28	36	58	82	82	105
	B6	6	7	10	12	15	20
	B7	173.3、181.3	214	282.5	373	441、443	501、503
C	C1	70、75、90	90、110、115、145	115、145、165	145、165、215	200、215、265	200、265、300
	C2	M4、M5、M6	M5、M6、M8	M6、M8、M10	M8、M10、M12	M10、M12、M16	M12、M16
	C3	11、14、16、19	19、24	24、28、32	28、32、35、38	35、38、42、48、55	38、42、48、55
	C4	33.5、41.5	51	67.5	84.5	114.5、116.5	117.5、119.5
	C5	50、60、70	70、80、95、110	95、110、130	110、130、180	114.3、180、230	114.3、230、250
	C6	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	64、70、80	92、110、130	122、130、150	146、150、190	182、200、250	222、250、265

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62A	75A	100A	142A	180A	220A
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	59	165	216	625	1,206	2,030
			20	51	146	208	555	1,069	1,804
			25	48	155	333	618	1,189	2,010
			30	45	150	315	583	1,118	1,911
			35	45	142	309	573	1,108	1,870
			40	51	146	208	555	1,069	1,824
			50	48	155	333	618	1,189	2,010
			70	45	142	309	573	1,108	1,870
			100	43	136	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque					
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	15 ~ 100	-	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
背隙 Backlash P0		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
背隙 Backlash P1		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P2		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	8	15	27	60	150	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	2,240	4,150	8,760	12,750	17,860	57,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	1,920	3,780	7,500	10,840	15,180	34,000
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	15 ~ 100	≥ 94%					
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C					
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			15 ~ 100	IP65					
安裝方向 Mounting Position			15 ~ 100	任意方向 Any					
噪音值 Noise Level		dB	15 ~ 100	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	15 ~ 100	2.6	8.2	11.5	25.6	43	

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

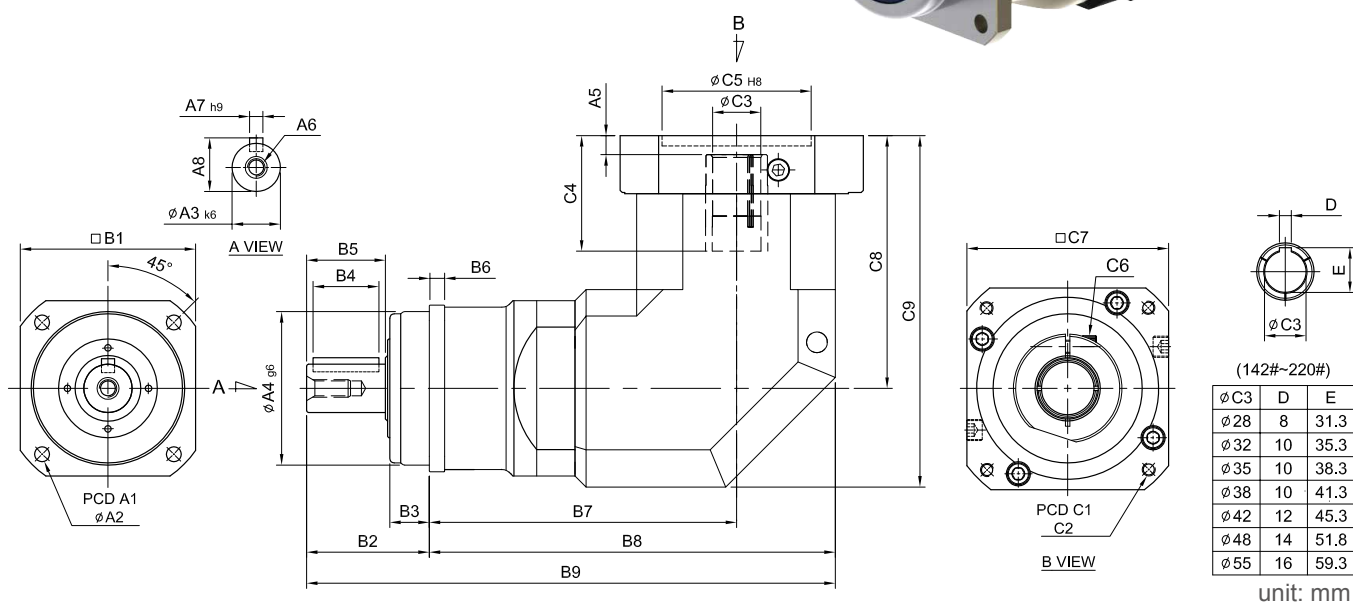
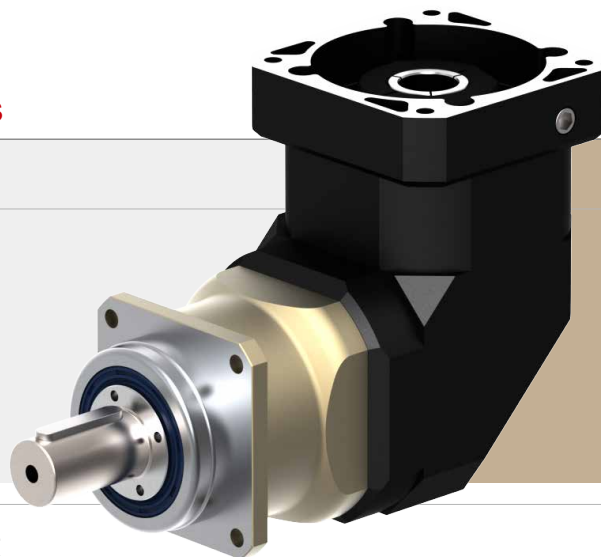
速比 Ratio	62A	75A	100A	142A	180A	220A
15	0.15	0.60	3.21	9.18	28.82	60.6
20	0.14	0.51	2.80	7.51	23.56	55.4
25	0.13	0.45	2.71	7.40	23.24	54.3
30	0.15	0.60	3.21	9.18	28.82	60.6
35	0.12	0.42	2.54	7.15	22.40	53.3
40	0.14	0.51	2.80	7.51	23.56	53.1
50	0.13	0.45	2.71	7.40	23.24	54.3
70	0.12	0.42	2.54	7.15	22.40	53.3
100	0.12	0.42	2.51	7.01	22.35	52.0

SERVOBOX Planetary Reducers

MODEL : SFL

單段 1-Stage

RATIO : 3, 4, 5, 6, 7, 8, 9, 10, 12, 14,
16, 18, 20



(142#~220#)

ø C3	D	E
ø28	8	31.3
ø32	10	35.3
ø35	10	38.3
ø38	10	41.3
ø42	12	45.3
ø48	14	51.8
ø55	16	59.3

unit: mm

	Model Code	62	75	100	142	180	220
A	A1	68	85	120	165	215	250
	A2	5.5	6.8	9	11	13	17
	A3	16	22	32	40	55	75
	A4	60	70	90	130	160	180
	A5	6	9	10	10	12.5 · 14.5	12.5 · 14.5
	A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	6	10	12	16	20
	A8	18	24.5	35	43	59	79.5
B	B1	62	76	106	142	180	220
	B2	48	56	88	112	112	138
	B3	18	18	27	27	26	30
	B4	20	32	50	70	70	90
	B5	28	36	58	82	82	105
	B6	6	7	10	12	15	20
	B7	97	142.9	162	191	254.1	277
	B8	128	187.9	222	262	344.1	383
C	B9	176	243.9	310	374	456.1	521
	C1	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265	200 · 265 · 300
	C2	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
	C3	11 · 14 · 16 · 19	16 · 19 · 22 · 24	24 · 28 · 32	28 · 32 · 35 · 38	35 · 38 · 42 · 48 · 55	38 · 42 · 48 · 55
	C4	33.5 · 41.5	54 · 68.5	67 · 77	84	114.5 · 116.5	114.5 · 116.5
	C5	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265
	C8	77 · 85	115.3	141	165.7	235 · 237	235 · 237
	C9	108 · 116	160.3	201	236.7	325 · 327	345 · 347

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62	75	100	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	59	165	216	625	1,206	2,030
			4	51	146	208	555	1,069	1,804
			5	48	155	333	618	1,189	2,010
			6	45	150	315	583	1,118	1,911
			7	45	142	309	573	1,108	1,870
			8	43	141	305	553	1,070	1,824
			9	44	140	293	516	993	1,694
			10	43	136	294	549	1,059	1,779
			12	45	150	315	583	1,118	1,911
			14	45	142	309	573	1,108	1,870
			16	43	141	305	553	1,070	1,824
			18	44	140	293	516	993	1,694
			20	43	138	294	549	1,059	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 20	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	3 ~ 20	3 倍額定輸出力矩 3 Times of Rated Output Torque					
急停扭矩 Emergency Stop Torque									
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 20	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 20	6,000	6,000	6,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	3 ~ 20	-	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2
背隙 Backlash P0		arcmin	3 ~ 20	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P1		arcmin	3 ~ 20	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
背隙 Backlash P2		arcmin	3 ~ 20	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 20	8	15	27	60	150	240
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 20	2,240	4,150	8,760	12,750	17,860	57,000
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 20	1,920	3,780	7,500	10,840	15,180	34,000
使用壽命 Service Life	L_H	hr	3 ~ 20	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	3 ~ 20	≥ 95%					
使用溫度 Operating Temperature		°C	3 ~ 20	- 25° C ~ + 90° C					
潤滑 Lubrication			3 ~ 20	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			3 ~ 20	IP65					
安裝方向 Mounting Position			3 ~ 20	任意方向 Any					
噪音值 Noise Level		dB	3 ~ 20	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	3 ~ 20	2.7	7.5	10.9	25.6	57.9	

轉動慣量 Mass Moments of Inertia (kg.cm²)

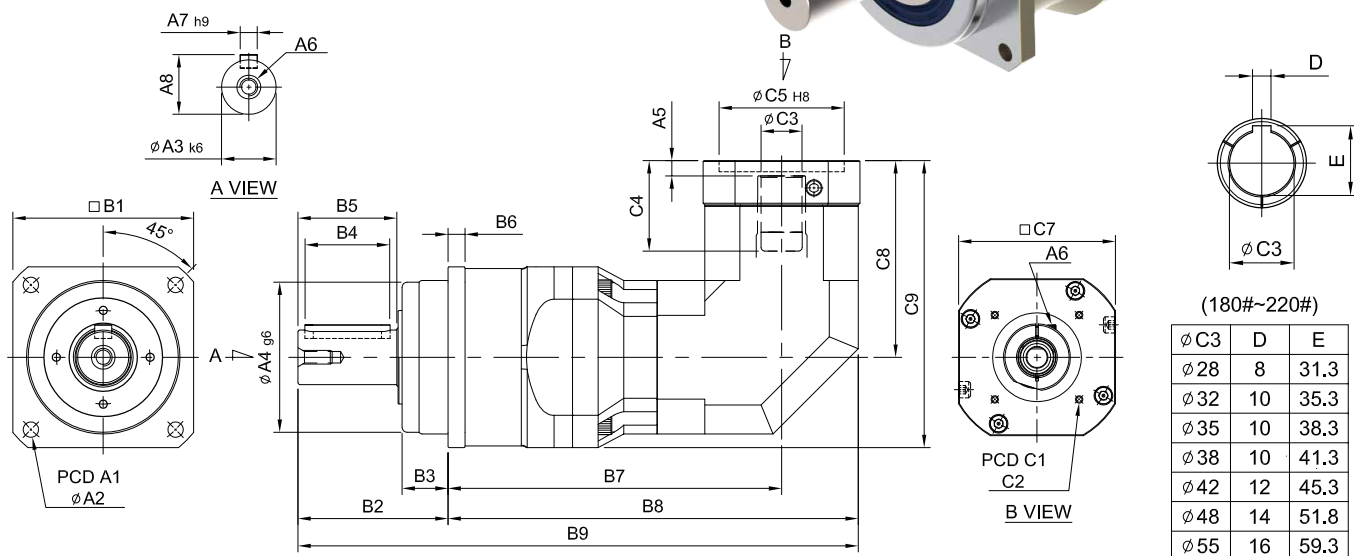
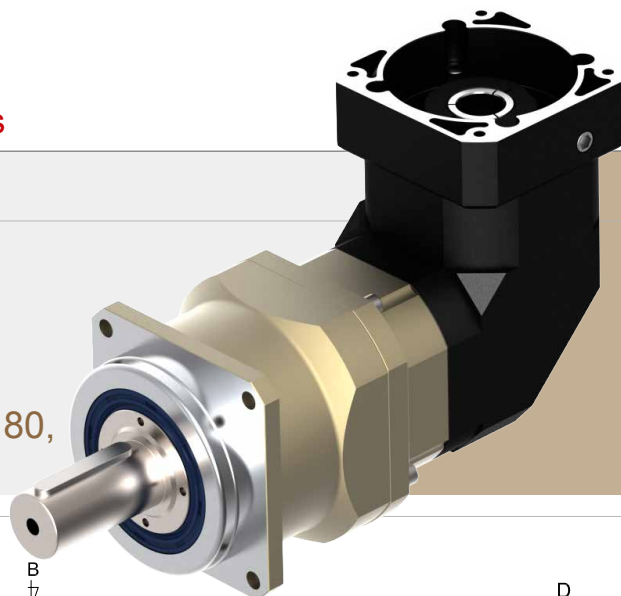
速比 Ratio	62	75	100	142	180	220
3	0.30	2.11	6.42	18.36	57.65	135.0
4	0.28	2.02	5.61	18.02	56.17	135.0
5	0.26	2.01	5.42	17.21	55.05	135.0
6	0.24	2.00	5.33	16.50	53.44	135.0
7	0.24	1.97	5.09	15.85	51.10	135.0
8	0.24	1.94	5.06	14.94	49.03	135.0
9	0.24	1.94	5.04	14.61	48.08	135.0
10	0.24	1.94	5.02	14.02	41.33	135.0
12	0.22	1.94	4.98	13.86	41.12	119.2
14	0.22	1.94	4.95	13.53	40.50	119.2
16	0.21	1.92	4.91	13.03	40.11	119.2
18	0.21	1.91	4.87	12.57	39.73	119.2
20	0.20	1.88	4.75	12.11	38.65	119.2

SERVOPBOX Planetary Reducers

MODEL : SFL

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100, 120, 140, 160, 180, 200



(180#~220#)

Ø C3	D	E
Ø 28	8	31.3
Ø 32	10	35.3
Ø 35	10	38.3
Ø 38	10	41.3
Ø 42	12	45.3
Ø 48	14	51.8
Ø 55	16	59.3

unit: mm

Model Code	62	75	100	142	180	220
A1	68	85	120	165	215	250
A2	5.5	6.8	9	11	13	17
A3	16	22	32	40	55	75
A4	60	70	90	130	160	180
A5	6	6	9	10	10	12.5 · 14.5
A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	5	6	10	12	16	20
A8	18	24.5	35	43	59	79.5
B1	62	76	106	142	180	220
B2	48	56	88	112	112	138
B3	18	18	27	27	26	30
B4	20	32	50	70	70	90
B5	28	36	58	82	82	105
B6	6	7	10	12	15	20
B7	123	148.3	195.6	240	280	359
B8	145	179.3	240.6	300	351	445
B9	193	235.3	328.6	412	463	583
C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8 · M10	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16
C3	8 · 9 · 11	11 · 14 · 16 · 19	16 · 19 · 22 · 24	24 · 28 · 32 · 35	28 · 32 · 35 · 38	35 · 38 · 42 · 48 · 55
C4	27	33.5 · 41.5	54	67	84	114.5 · 116.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250
C8	61	77 · 85	115.3	141	165.7	235 · 237
C9	92	117 · 125	168.3	212	255.7	345 · 347

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62	75	100	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	59	165	216	625	1,206	2,030
			20	51	146	208	555	1,069	1,804
			25	48	155	333	618	1,189	2,010
			30	45	150	315	583	1,118	1,911
			35	45	142	309	573	1,108	1,870
			40	43	141	305	553	1,070	1,824
			50	48	155	333	618	1,189	2,010
			60	45	150	315	583	1,118	1,911
			70	45	142	309	573	1,108	1,870
			80	43	141	305	553	1,070	1,824
			90	44	140	293	516	993	1,694
			100	43	136	294	549	1,059	1,779
			120	45	150	315	583	1,118	1,911
			140	45	142	309	573	1,108	1,870
			160	43	141	305	553	1,070	1,824
			180	44	140	293	516	993	1,694
			200	51	146	208	555	1,069	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 200	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	15 ~ 200	3 倍額定輸出力矩 3 Times of Rated Output Torque					
急停扭矩 Emergency Stop Torque									
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 200	6,000	6,000	5,000	5,000	4,000	4,000
背隙 Backlash Ps		arcmin	15 ~ 200	-	-	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P0		arcmin	15 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P1		arcmin	15 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
背隙 Backlash P2		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 200	8	15	27	60	150	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 200	2,240	4,150	8,760	12,750	17,860	57,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 200	1,920	3,780	7,500	10,840	15,180	34,000
使用壽命 Service Life	L_H	hr	15 ~ 200	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	15 ~ 200	≥ 92%					
使用溫度 Operating Temperature		°C	15 ~ 200	- 25° C ~ + 90° C					
潤滑 Lubrication			15 ~ 200	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			15 ~ 200	IP65					
安裝方向 Mounting Position			15 ~ 200	任意方向 Any					
噪音值 Noise Level		dB	15 ~ 200	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	15 ~ 200	2.93	4.8	11.38	21.5	46.47	

轉動慣量 Mass Moments of Inertia (kg.cm²)

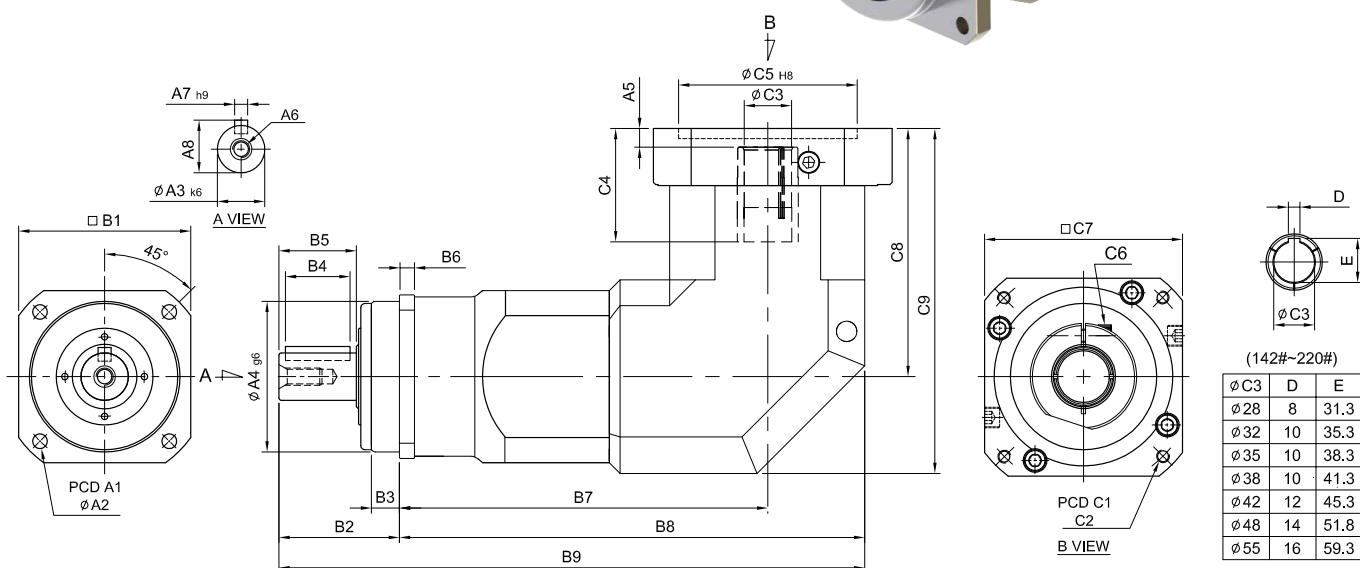
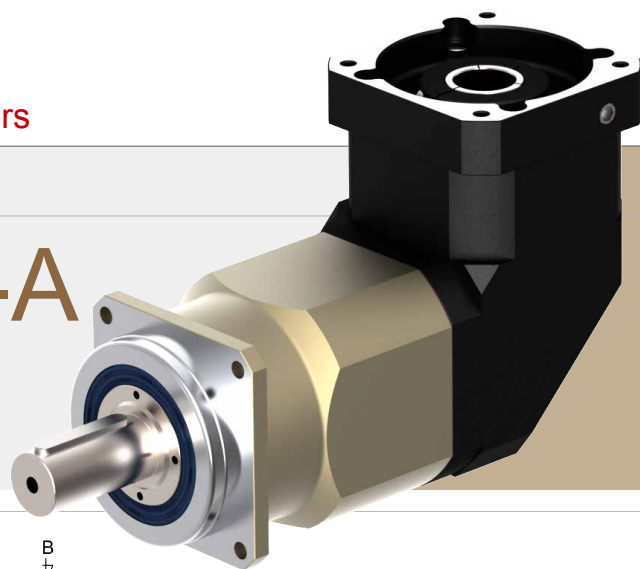
速比 Ratio	62	75	100	142	180	220
15	0.09	0.34	2.20	6.85	26.2	70.1
20	0.09	0.34	2.20	6.85	26.2	70.1
25	0.09	0.34	2.20	6.85	23.1	68.2
30	0.09	0.34	2.20	6.85	23.1	68.2
35	0.09	0.34	2.20	6.85	23.1	68.2
40	0.09	0.34	2.20	6.85	23.1	68.2
50	0.09	0.34	2.20	6.85	23.1	68.2
60	0.09	0.34	2.20	6.85	23.1	68.2
70	0.09	0.34	2.20	6.85	23.1	68.2
80	0.09	0.34	2.20	6.85	23.1	68.2
90	0.09	0.34	2.20	6.85	23.1	68.2
100	0.09	0.34	2.20	6.85	23.1	68.2
120	0.03	0.30	1.86	6.20	21.2	65.1
140	0.03	0.30	1.86	6.20	21.2	65.1
160	0.03	0.30	1.86	6.20	21.2	65.1
180	0.03	0.30	1.86	6.20	21.2	65.1
200	0.03	0.30	1.86	6.20	21.2	65.1

SERVOBOX Planetary Reducers

MODEL : SFL-A

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60,
70, 80, 100, 140, 200



unit: mm

	Model Code	62A	75A	100A	142A	180A	220A
A	A1	68	85	120	165	215	250
	A2	5.5	6.8	9	11	13	17
	A3	16	22	32	40	55	75
	A4	60	70	90	130	160	180
	A5	6	9	10	10	12.5 · 14.5	12.5 · 14.5
	A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	6	10	12	16	20
	A8	18	24.5	35	43	59	79.5
B	B1	62	76	106	142	180	220
	B2	48	56	88	112	112	138
	B3	18	18	27	27	26	30
	B4	20	32	50	70	70	90
	B5	28	36	58	82	82	105
	B6	6	7	10	12	15	20
	B7	130.8	173.9	206	258	335.1	370
	B8	161.8	218.9	266	329	425.1	476
	B9	209.8	274.9	354	441	537.1	614
C	C1	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265	200 · 265 · 300
	C2	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
	C3	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55	38 · 42 · 48 · 55
	C4	33.5 · 41.5	54 · 68.5	67 · 77	84	114.5 · 116.5	114.5 · 116.5
	C5	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265
	C8	77 · 85	115.3	141	165.7	235 · 237	235 · 237
	C9	108 · 116	160.3	201	236.7	325 · 327	345 · 347

High Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62A	75A	100A	142A	180A	220A
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	59	165	216	625	1,206	2,030
			20	51	146	208	555	1,069	1,804
			25	48	155	333	618	1,189	2,010
			30	45	150	315	583	1,118	1,911
			35	45	142	309	573	1,108	1,870
			40	43	141	305	555	1,070	1,824
			50	48	155	333	618	1,189	2,010
			60	45	150	315	583	1,118	1,911
			70	45	142	309	573	1,108	1,870
			80	43	141	305	553	1,070	1,824
			100	43	136	294	549	1,059	1,779
			140	45	142	309	573	1,108	1,870
			200	51	146	208	555	1,069	1,779
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 200	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 200	3 倍額定輸出力矩 3 Times of Rated Output Torque					
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 200	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash Ps		arcmin	15 ~ 200	-	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
背隙 Backlash P0		arcmin	15 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
背隙 Backlash P1		arcmin	15 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
背隙 Backlash P2		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 200	8	15	27	60	150	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 200	2,240	4,150	8,760	12,750	17,860	57,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 200	1,920	3,780	7,500	10,840	15,180	34,000
使用壽命 Service Life	L_H	hr	15 ~ 200	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	15 ~ 200	≥ 92%					
使用溫度 Operating Temperature		°C	15 ~ 200	- 25° C ~ + 90° C					
潤滑 Lubrication			15 ~ 200	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			15 ~ 200	IP65					
安裝方向 Mounting Position			15 ~ 200	任意方向 Any					
噪音值 Noise Level		dB	15 ~ 200	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	15 ~ 200	3.5	11.1	16.8	29.9	66.1	

 ■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

速比 Ratio	62A	75A	100A	142A	180A	220A
15	0.15	0.60	3.21	9.18	28.82	80.2
20	0.14	0.51	2.80	7.51	23.56	80.2
25	0.13	0.45	2.71	7.40	23.24	76.5
30	0.12	0.43	2.66	7.32	22.91	76.5
35	0.12	0.42	2.54	7.15	22.40	76.5
40	0.14	0.51	2.80	7.51	23.56	76.5
50	0.13	0.45	2.71	7.40	23.24	76.5
60	0.12	0.43	2.66	7.32	22.91	76.5
70	0.12	0.42	2.54	7.15	22.40	76.5
80	0.14	0.51	2.80	7.51	23.56	76.5
100	0.13	0.45	2.71	7.40	23.24	76.5
140	0.12	0.42	2.54	7.15	22.40	74.2
200	0.11	0.41	2.48	7.02	22.14	74.3

FABGEAR[®]

精密伺服用行星減速機

Characteristic of FABGEAR Series

FABGEAR 系列產品特性

標準型減速機

背 隙

全系列單段背隙 ≤ 8 弧分

全系列雙段背隙 ≤ 10 弧分

靜 音

使用高精度斜齒輪實現順暢安靜地運轉。

高 扭 矩

比一般正齒輪行星減速機扭矩高。

高 效 率

單段式在 97% 以上，雙段式在 94% 以上。

Inline Reducer

Low Backlash

1-Stage Backlash ≤ 8 arcmin

2-Stage Backlash ≤ 10 arcmin

Quiet operation

Helical gears contribute to reduce vibration and noise.

High Torque

High output torque is in comparison with spur gear planetary gear reducers.

High Efficiency

Efficiency for 1-stage model exceeds 97%; 2-stage model exceeds 94%.

直交軸減速機

背 隙

全系列單段背隙 ≤ 10 弧分

全系列雙段背隙 ≤ 12 弧分

靜 音

使用研磨等級螺旋傘齒輪及螺旋齒輪實現順暢安靜地運轉。

高剛性、高扭矩

使用整體式滿針滾針軸承，一體式內齒箱及螺旋齒輪，提高了剛性和扭矩。

高 效 率

單段式在 95% 以上，雙段式在 92% 以上。

Right Angle Reducer

Low Backlash

1-Stage Backlash ≤ 10 arcmin

2-Stage Backlash ≤ 12 arcmin

Quiet operation

Grinding spiral bevel gear & Helical gears contribute to reduce vibration and noise.

High Rigidity & High Torque

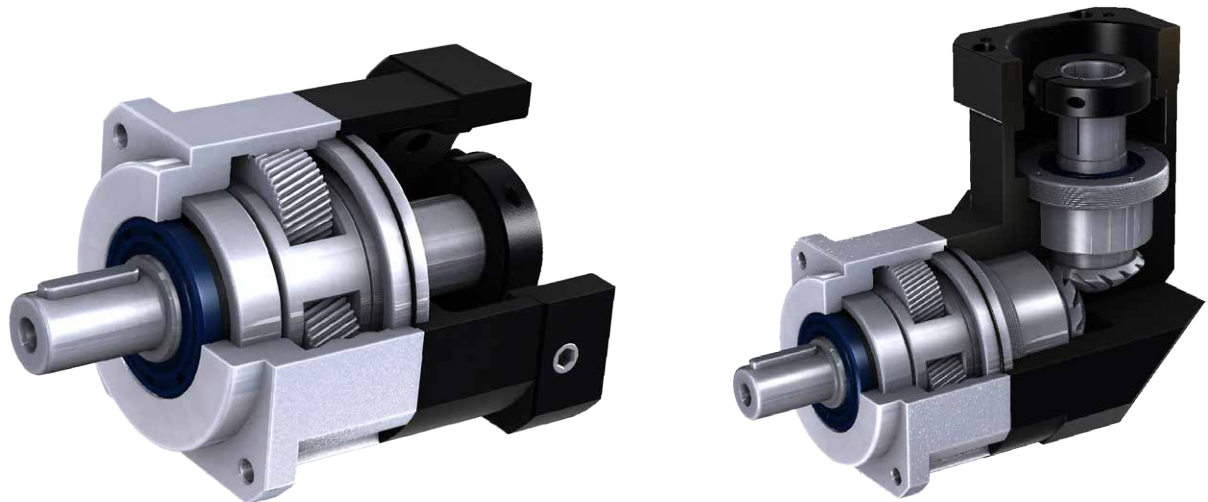
High rigidity & high torque are achieved by integrant needle roller bearings and one-piece constructed.

High Efficiency

Efficiency for 1-stage model exceeds 95%; 2-stage model exceeds 92%.

Features of FABGEAR Series

FABGEAR 系列產品特點



PBL

螺旋傘齒輪

研磨等級螺旋傘齒輪傳動效率高，傳動比穩定，圓弧重疊係數大，承載能力高，傳動平穩平順，工作可靠，結構緊湊，耐磨損，壽命長。

Spiral Bevel Gear

Grinding spiral bevel gear is excellent in transmission efficiency, stability, durability, large arc overlapping factor, heavy loading, compact structure, wear-resisting and long service life.



螺旋齒輪設計

減速機構採用螺旋齒輪設計，齒形嚙合率為一般正齒輪的二倍以上，具有運轉平順、低噪音、高輸出扭矩和低背隙的特性。

Helical Gear Design

The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also features extremely smooth running, low noise, high torque output and low backlash.



筒夾式連結機構

輸入端與馬達的連結採用筒夾式的鎖緊機構，並經動平衡分析，以確保在高輸入轉速下結合介面的同心度和平衡度，及零背隙的動力傳遞。

Collet Locking Mechanism

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.



滿針滾針軸承設計

行星齒輪的傳動介面採用不含保持器之滿針滾針軸承，增加接觸面積以提高結構剛性及使用壽命。

Full Needle Roller Bearings Design

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.



一體式行星臂架及雙懸臂設計

行星臂架與輸出軸採一體式的結構設計，以確保提高扭轉剛性及精確度。

Integrated Planetary Arm Bracket

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy.

全合成潤滑油脂

採 IP65 防護等級的密封設計，潤滑油脂不洩漏免保養。

Synthetic Lubrication Grease

The protective class IP65 seals design avoids leakage problem. It features no maintenance.

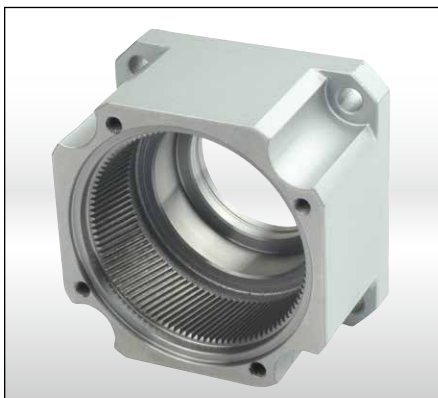


高精度齒輪加工

行星齒輪及太陽齒輪材料採用高級之鎳鉻鉬合金鋼 (SNCM220)，切削加工後，經滲碳熱處理至硬度 57~60HRC，再進行齒面研磨，確保齒輪精度在 DIN6 級以內，比只有表面的氮化處理，獲得最佳的耐磨耗和耐衝擊韌性，壽命更長。

High Precision Gear Machining

The planetary gear and sun gear are made by high quality Ni-Cr-Mo alloy steel (SNCM220), precision machined and carburized to hardness 57-60 HRC. Precision teeth grinding assures gear accuracy reaches DIN6 class. It provides better wear resistance, impact resistance and longer service life than gears with only surface nitrided.

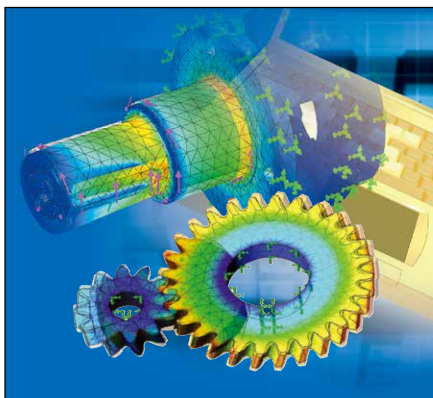


一體式螺旋內齒輪箱

齒輪箱和內環齒輪採一體式的設計，減速機構採用螺旋齒輪設計，齒形嚙合率為一般正齒輪的二倍以上，具有運轉平順、低噪音、高輸出扭矩和低背隙的特性。

One-piece Helical Gear Box

The gear box and internal ring gear are one-piece constructed. The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also has features of extremely smooth running, low noise, high output torque and low backlash.

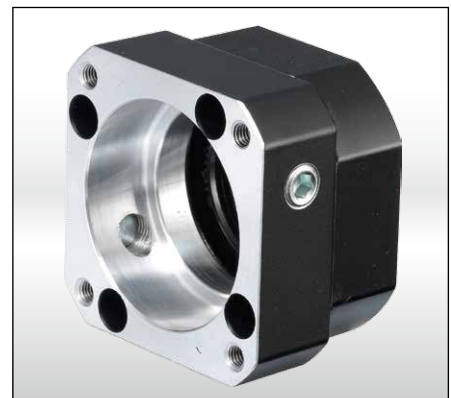


CAE 設計分析技術

利用 3D-CAE 軟體的設計分析技術，對減速機整體強度進行分析及螺旋齒面作齒形及導程修整，以降低齒輪對啮入及啮出的衝擊和噪音，增加齒輪系及減速機的使用壽命。

CAE Design and Analysis

Employs 3D-CAE software for analysis and design, the software allows for analyzing the strength of the entire gear reducer and modifying the helical teeth profile and lead. This reduces the impact and noise during teeth engage and disengage, while increasing the service life of gears and the gear reducer.



模組化馬達連接板設計

獨特的馬達連接板模組化設計，適用於任何廠牌和型式的伺服馬達，材質採用鋁合金，表面經由防氧化處理，提高環境的耐受性和抗腐蝕能力。

Modular Design of Motor Connection Plate

The special modular design of motor connection plate is suitable for any brand and any type of servomotor. It is made by aluminum alloy. Its surface is anti-oxidant treated for upgrading environmental-resistant and corrosion-resistant capability.

Indication of Model Numbers

機種型號表示

PB	90	10			MOTOR
減速機型 Type	型號 Model	速比 Ratio	出力軸鍵槽 Output Shaft	入力軸鍵槽 Input Shaft	馬達型號 Motor Type
PB	44	單段 1-Stage	☐ 標準品，有鍵槽 Standard (Keyway)	☐ 無鍵槽 No Keyway	
PB-A	62	3, 4, 5, 6, 7, 8, 9, 10			
PBL	90	雙段 2-Stage	N: 實心軸，無鍵槽 Solid Output Shaft (No Keyway)	K: 有鍵槽 Keyway (142#~220#)	
PBL-A	120	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100			
PBT	142	單段 1-Stage (PBL)			
	180	3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20			
	220	雙段 2-Stage (PBL)			
		15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100, 120, 140, 160, 180, 200			
		單段 1-Stage (PBT)			
		3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45, 50			

PB



PB-A



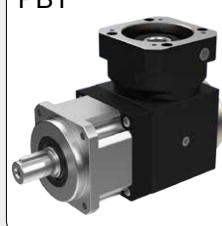
PBL



PBL-A



PBT



Description of Standard and A-Type

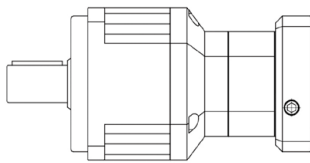
標準型及 A-Type 說明

在 2 段或 3 段減速時，減速比高，輸出扭矩大，標準型的 2 段或 3 段齒箱為大齒箱接小齒箱，可限制入力馬力，以符合額定輸出扭矩。

A-Type 為二個相同框號齒箱的連結。

The features of 2-stage or 3-stage gearbox are high gear ratio and large output torque. The standard type of 2-stage or 3-stage gearbox are combined by big and small gearboxes to have a limit to input power and then to meet rated output torque. A-Type has a combination of 2 gearboxes with same frame.

Standard



例如：

使用伺服馬達，功率 0.5kW，額定輸出扭矩 2.39Nm，馬達軸心為 Ø24mm

1. 假設減速比為 1/50 時：

輸出扭矩為 $2.39\text{Nm} \times 50 \times 94\%$ (效率) = 112Nm

(1) 可選擇 SB-120-50

額定輸出扭矩 333Nm S.F.=2.6 (安全係數)

(2) 亦可選擇 SB-90A-50

額定輸出扭矩 141Nm S.F.=1.25 (降框號使用)

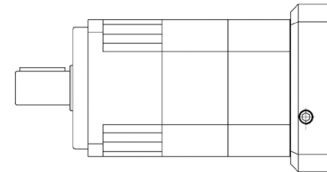
2. 假設減速比為 1/100 時：

輸出扭矩為 $2.39 \times 100 \times 94\%$ (效率) = 224Nm

可選用 SB-120-100 S.F.=1.3

選用 SB-90A-100 時 S.F.=0.62 安全係數不足，不建議使用

A-Type



Example:

Servo motor 0.5 kW, rated output torque 2.39 Nm, motor shaft Ø24 mm.

1. Suppose the speed reduction ratio is 1/50:

Output torque is $2.39 \text{ Nm} \times 50 \times 94\%$ (efficiency) = 112 Nm.

(1) You can select SB-120-50 with rated output torque of 333 Nm and S.F. = 2.6

(2) You can select SB-90A-50 with rated output torque of 141 Nm and S.F. = 1.25

2. Suppose the speed reduction ratio is 1/100:

Output torque is $2.39 \times 100 \times 94\%$ (efficiency) = 224 Nm.

You can select SB-120-100 and S.F. = 1.3. You are not suggested to choose SB-90A-100 because of low S.F. = 0.62.

Description Right Angle of L-Type and T-Type

直交軸 L-Type / L-Type 說明

PBL：螺旋傘齒輪段減速比 1:1、1:2

優點：總長度較短

缺點：減速比較少

PBT：螺旋傘齒輪段減速比 1:1、1:2、1:3、1:4、1:5

優點：減速比較多

缺點：總長度較長

9BL：Spiral Bevel Gear Ratio 1:1, 1:2

Pros: Shorter overall length.

Cons: Ratio less.

PBT：Spiral Bevel Gear Ratio 1:1, 1:2, 1:3, 1:4, 1:5

Pros: Ratio more.

Cons: Overall length is longer.

L-Type

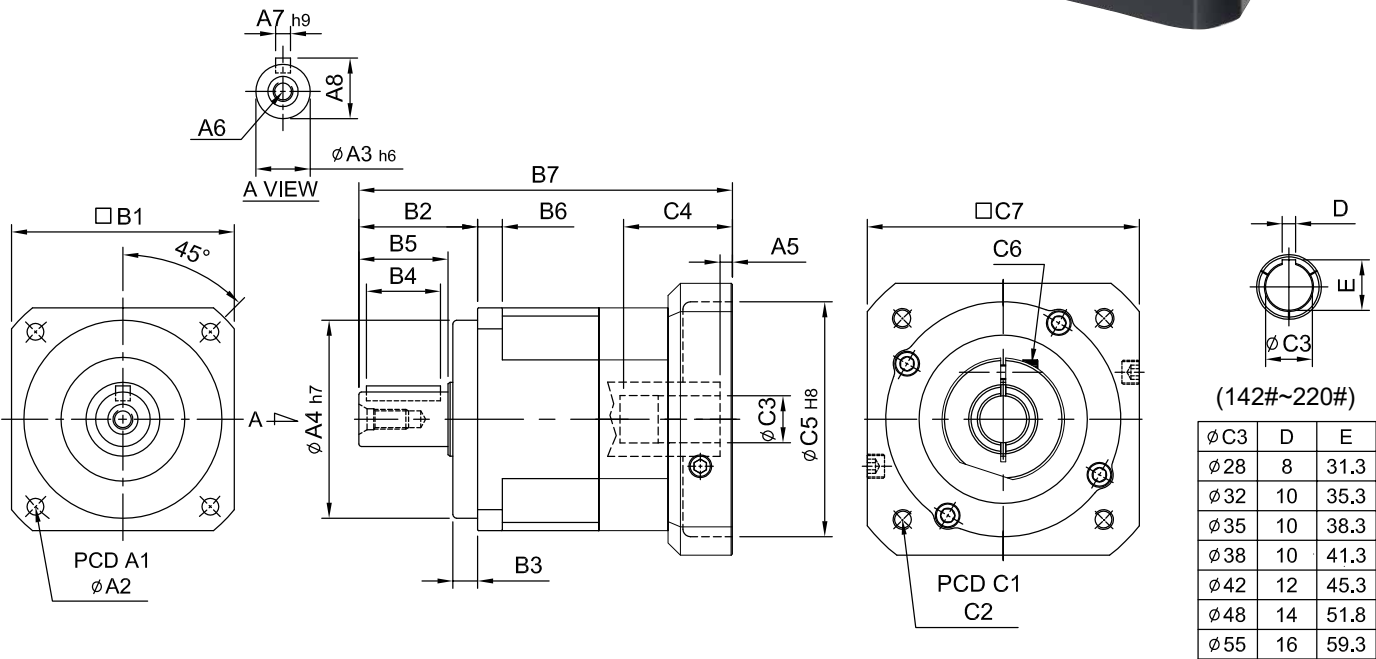


T-Type



MODEL : PB

單段 1-Stage
RATIO : 3, 4, 5, 6, 7, 8, 9, 10



unit: mm								
A	Model Code	44	62	90	120	142	180	220
	A1	50	70	100	130	165	215	250
	A2	4.5	5.5	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	5	6	9・23.5	10・20	10	11.5・13.5	12.5・14.5
	A6	M4×P0.7	M5×P0.8	M8×P1.25	M10×P1.5	M12×P1.75	M14×P2.0	M16×P2.0
	A7	5	5	6	10	12	16	20
B	A8	15	18	24.5	35	43	59	79.5
	B1	44	62	90	120	142	180	220
	B2	26	36	48	65	92	106	139
	B3	5	7	10	12	15	20	30
	B4	15	20	30	40	65	70	90
	B5	20	28	36	50	74	82	104
	B6	5	8	10	12	15	16	20
C	B7	95	115・123	164.5・179	205・215	260.5	323.5・325.5	367.5・369.5
	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・215	200・215・265	200・265・300
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12	M10・M12・M16	M12・M16
	C3	8・9・11	11・14・16・19	16・19・22・24	22・24・28・32	28・32・35・38	35・38・42・48・55	38・42・48・55
	C4	26・30.5	33.5・41.5	59・73.5	67・77	84.5	116.5・118.5	117.5・119.5
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	110・130・180	114.3・180・230	114.3・230・250
	C6	M4×P0.7	M5×P0.8	M6×P1.0	M8×P1.25	M10×P1.5	M10×P1.5	M10×P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190	182・200・250	222・250・265

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	44	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	17	54	145	301	553	1,067	1,786
			4	15	48	128	269	491	940	1,587
			5	14	45	132	278	510	1,050	1,770
			6	13	41	125	252	466	985	1,680
			7	13	41	123	258	473	975	1,645
			8	12	39	115	241	442	942	1,605
			9	11	40	120	227	412	875	1,490
			10	12	40	116	246	452	930	1,565
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 10	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 10	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 10	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash		arcmin	3 ~ 10	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 10	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 10	360	1,120	3,040	6,460	8,830	14,820	48,450
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 10	180	560	1,520	3,230	4,410	7,410	24,225
使用壽命 Service Life	L_H	hr	3 ~ 10	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation : >30,000 (S1 Continuous Operation : >15,000 hrs)						
效率 Efficiency	η	%	3 ~ 10	≥ 97%						
使用溫度 Operating Temperature		°C	3 ~ 10	- 25° C ~ + 90° C						
潤滑 Lubrication			3 ~ 10	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			3 ~ 10	IP65						
安裝方向 Mounting Position			3 ~ 10	任意方向 Any						
噪音值 Noise Level		dB	3 ~ 10	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	3 ~ 10	0.58	1.35	3.69	8.63	14.55	28.3	42.5

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

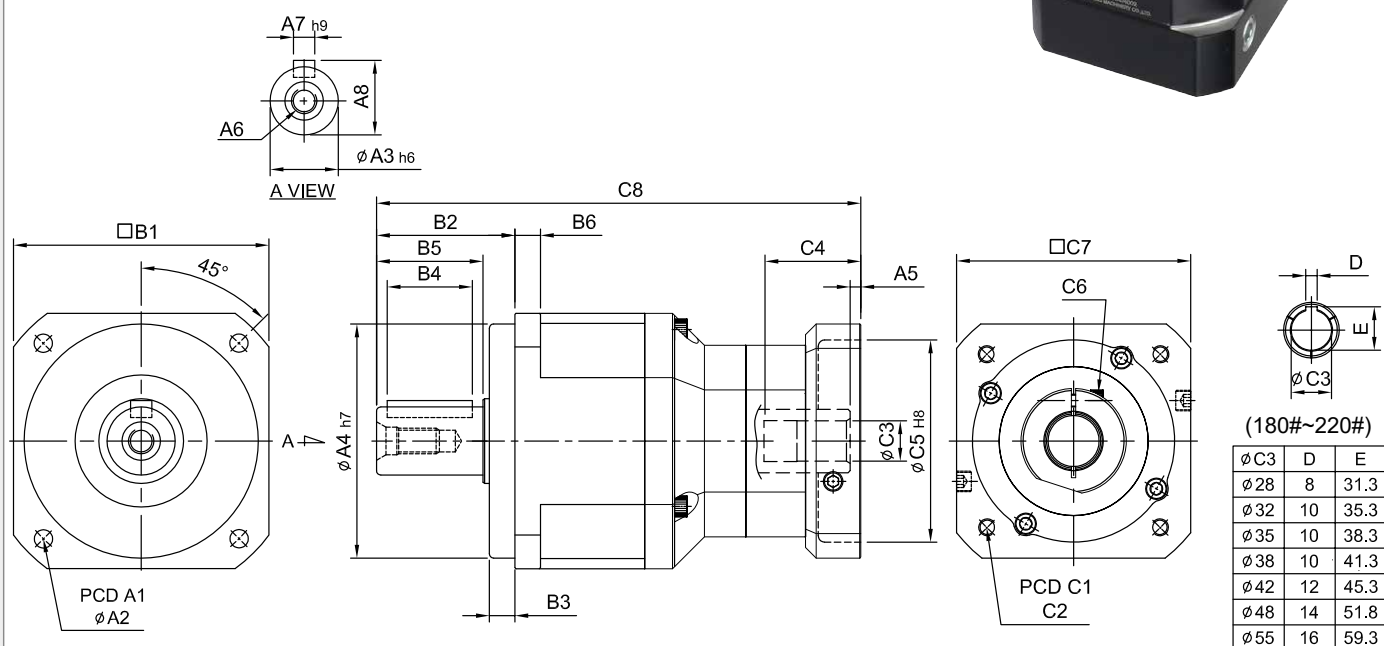
Ratio	44	62	90	120	142	180	220
3	0.03	0.16	0.61	3.25	9.21	28.98	59.61
4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
5	0.03	0.13	0.47	2.74	7.42	23.29	53.27
6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
8	0.03	0.13	0.44	2.58	7.07	22.59	50.84
9	0.03	0.13	0.44	2.57	7.04	22.53	50.63
10	0.03	0.13	0.44	2.57	7.03	22.51	50.56



MODEL : PB

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100



unit: mm

	Model	Unit: mm					
	Code	62	90	120	142	180	220
A	A1	70	100	130	165	215	250
	A2	5.5	6.8	9	11	13	17
	A3	16	22	32	40	55	75
	A4	50	80	110	130	160	180
	A5	5	6	9・23.5	10・20	10	11.5・13.5
	A6	M5×P0.8	M8×P1.25	M10×P1.5	M12×P1.75	M14×P2.0	M16×P2.0
	A7	5	6	10	12	16	20
	A8	18	24.5	35	43	59	79.5
B	B1	62	90	120	142	180	220
	B2	36	48	65	92	106	139
	B3	7	10	12	15	20	30
	B4	20	30	40	65	70	90
	B5	28	36	50	74	82	104
	B6	8	10	12	15	16	20
C	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・215	200・215・265
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12	M10・M12
	C3	8・9・11	11・14・16・19	16・19・22・24	22・24・28・32	28・32・35・38	35・38・42・48・55
	C4	26・30.5	33.5・41.5	59・73.5	67・77	84.5	116.5・118.5
	C5	30・40・50	50・60・70	70・80・95・110	70・95・110・130	110・130・180	114.3・180・230
	C6	M4×P0.7	M5×P0.8	M6×P1.0	M8×P1.25	M10×P1.5	M10×P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・180・190	182・200・250
	C8	139.5	172.5・180.5	241・255.5	298.5・308.5	358.5	446.5・448.5

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	54	145	301	553	1,067	1,786
			20	48	128	269	491	940	1,587
			25	45	132	278	510	1,050	1,770
			30	41	125	252	466	985	1,680
			35	41	123	258	473	975	1,645
			40	39	115	241	442	942	1,605
			50	45	132	278	510	1,050	1,770
			60	41	125	252	466	985	1,680
			70	41	123	258	473	975	1,645
			80	40	115	241	442	942	1,605
			90	40	120	227	412	875	1,490
			100	40	116	246	452	930	1,565
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出扭矩 3 Times of Rated Output Torque					
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	6,000	6,000	6,000	5,000	5,000	4,000
背隙 Backlash		arcmin	15 ~ 100	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	1,120	3,040	6,460	8,830	14,820	48,450
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	560	1,520	3,230	4,410	7,410	24,225
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	15 ~ 100	≥ 94%					
使用溫度 Operating Temperature		°C	15 ~ 100	-25° C ~ +90° C					
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			15 ~ 100	IP65					
安裝方向 Mounting Position			15 ~ 100	任意方向 Any					
噪音值 Noise Level		dB	15 ~ 100	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	15 ~ 100	1.6	4.04	9.49	17	34.1	57.3

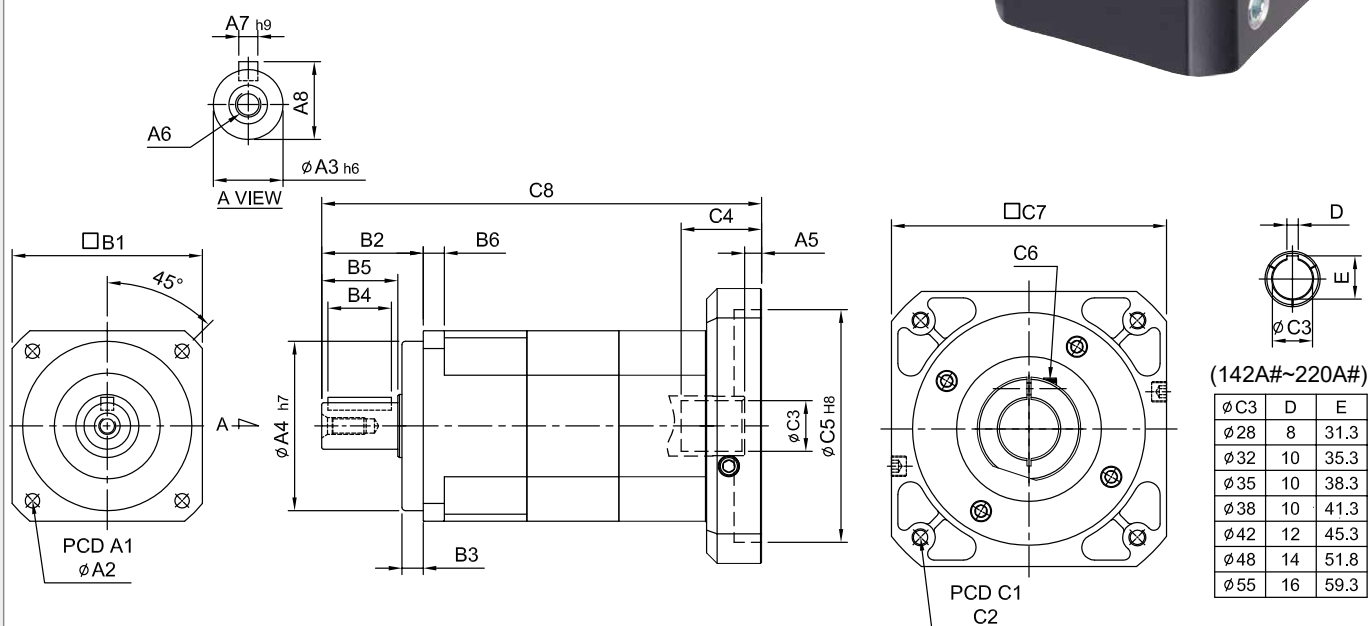
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	62	90	120	142	180	220
15	0.03	0.14	0.46	2.63	7.30	22.79
20	0.03	0.14	0.46	2.63	7.30	22.79
25	0.03	0.14	0.46	2.63	7.10	22.79
30	0.03	0.14	0.46	2.43	7.10	22.59
35	0.03	0.14	0.44	2.43	7.10	22.59
40	0.03	0.14	0.44	2.43	6.92	22.59
50	0.03	0.14	0.44	2.43	6.92	22.59
60	0.03	0.14	0.43	2.39	6.72	21.83
70	0.03	0.14	0.43	2.39	6.72	21.83
80	0.03	0.14	0.43	2.39	6.72	21.83
90	0.03	0.14	0.40	2.39	6.72	21.60
100	0.03	0.14	0.40	2.39	6.72	21.60

MODEL : PB-A

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100



unit: mm

	Model Code	44A	62A	90A	120A	142A	180A	220A
A	A1	50	70	100	130	165	215	250
	A2	4.5	5.5	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	5	6	9・23.5	10・20	10	11.5・13.5	12.5・14.5
	A6	M4 × P0.7	M5 × P0.8	M8 × P1.25	M10 × P1.5	M12 × P1.75	M14 × P2.0	M16 × P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
B	B1	44	62	90	120	142	180	220
	B2	26	36	48	65	92	106	139
	B3	5	7	10	12	15	20	30
	B4	15	20	30	40	65	70	90
	B5	20	28	36	50	74	82	104
	B6	5	8	10	12	15	16	20
C	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・215	200・215・265	200・265・300
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12	M10・M12	M12・M16
	C3	8・9・11	11・14・16・19	16・19・22・24	22・24・28・32	28・32・35・38	35・38・42・48・55	38・42・48・55
	C4	26	33.5・41.5	59・73.5	67・77	84.5	114.5・116.5	117.5・119.5
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	110・130・180	114.3・180・230	114.3・230・250
	C6	M4 × P0.7	M5 × P0.8	M6 × P1.0	M8 × P1.25	M10 × P1.5	M10 × P1.5	M10 × P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190	182・200・250	222・250・265
	C8	121	148.8・156.8	208・222.5	261・271	327	404.5・406.5	460.5・462.5

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	44A	62A	90A	120A	142A	180A	220A
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	17	54	145	301	553	1,067	1,786
			20	15	48	128	269	491	940	1,587
			25	14	45	132	278	510	1,050	1,770
			30	13	41	125	252	466	985	1,680
			35	13	41	123	258	473	975	1,645
			40	12	39	115	241	442	942	1,605
			50	14	45	132	278	510	1,050	1,770
			60	13	41	125	252	466	985	1,680
			70	13	41	123	258	473	975	1,645
			80	12	40	115	241	442	942	1,605
			90	11	40	120	227	412	875	1,490
			100	12	40	116	246	452	930	1,565
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出扭矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{IN}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{IB}	rpm	15 ~ 100	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash		arcmin	15 ~ 100	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	360	1,120	3,040	6,460	8,830	14,820	48,450
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	180	560	1,520	3,230	4,410	7,410	24,225
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	15 ~ 100	≥ 94%						
使用溫度 Operating Temperature		°C	15 ~ 100	-25° C ~ +90° C						
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			15 ~ 100	IP65						
安裝方向 Mounting Position			15 ~ 100	任意方向 Any						
噪音值 Noise Level		dB	15 ~ 100	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
重量 Weight ±3%		Kg	15 ~ 100	0.86	2	5.48	10	21.4	42	59

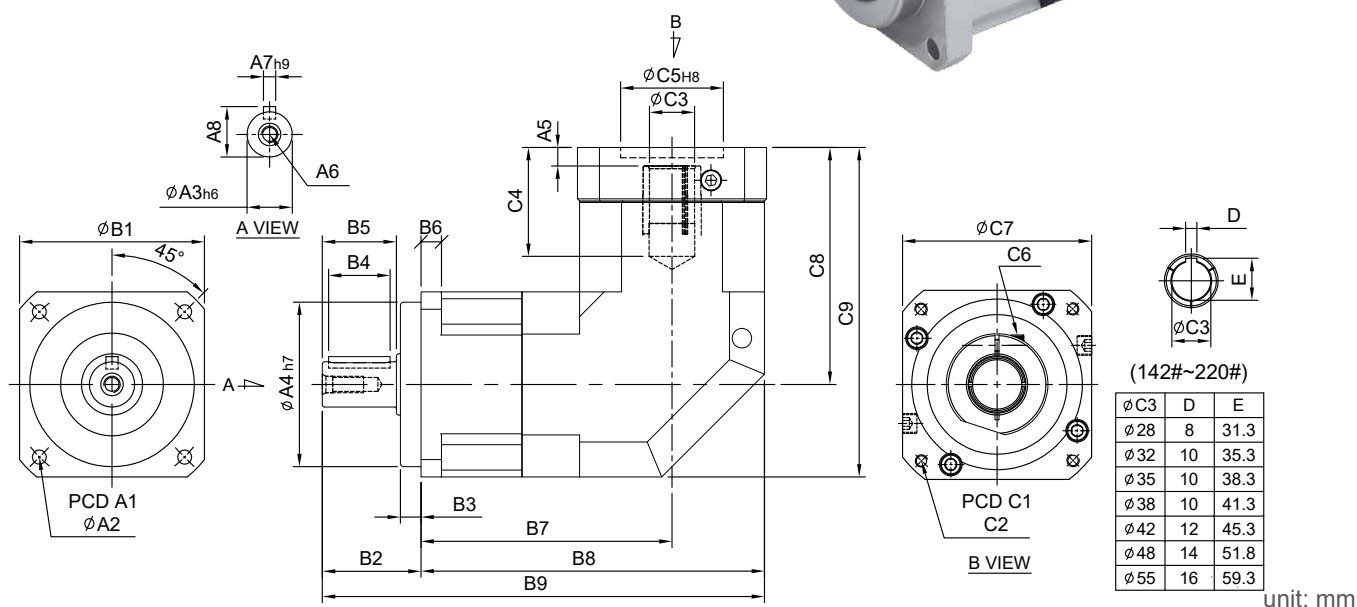
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	44A	62A	90A	120A	142A	180A	220A
15	0.03	0.14	0.46	2.63	7.30	22.79	56.98
20	0.03	0.14	0.46	2.63	7.30	22.79	56.98
25	0.03	0.14	0.46	2.63	7.10	22.79	56.98
30	0.03	0.14	0.46	2.43	7.10	22.59	56.48
35	0.03	0.14	0.44	2.43	7.10	22.59	56.48
40	0.03	0.14	0.44	2.43	6.92	22.59	56.48
50	0.03	0.14	0.44	2.43	6.92	22.59	56.48
60	0.03	0.14	0.43	2.39	6.72	21.83	54.58
70	0.03	0.14	0.43	2.39	6.72	21.83	54.58
80	0.03	0.14	0.43	2.39	6.72	21.83	54.58
90	0.03	0.14	0.40	2.39	6.72	21.60	54.00
100	0.03	0.14	0.43	2.39	6.72	21.83	54.58

MODEL : PBL

單段 1-Stage

RATIO : 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20



unit: mm

A	Model Code	44	62	90	120	142	180	220
	A1	50	70	100	130	165	215	250
	A2	4.5	5.5	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	6	6	9 · 23.5	10 · 20	10	12.5 · 14.5	12.5 · 14.5
	A6	M4 × P0.7	M5 × P0.8	M8 × P1.25	M10 × P1.5	M12 × P1.75	M14 × P2.0	M16 × P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
B	B1	44	62	90	120	142	180	220
	B2	26	36	48	65	92	106	139
	B3	5	7	10	12	15	20	30
	B4	15	20	30	40	65	70	90
	B5	20	28	36	50	74	82	104
	B6	5	8	10	12	15	16	20
	B7	76	84.5	122.1	148	165.5	223.6	231.6
	B8	98	115.5	167.1	208	236.5	313.6	341.6
	B9	124	151.5	215.1	273	328.5	419.6	480.6
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265	200 · 265 · 300
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
	C3	8 · 11	11 · 14 · 16 · 19	16 · 19 · 22 · 24	24 · 28 · 32	28 · 32 · 35 · 38	35 · 38 · 42 · 48 · 55	38 · 42 · 48 · 55
	C4	27	33.5 · 42	53 · 67.5	67 · 77	85	117 · 119	117 · 119
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M4 × P0.7	M5 × P0.8	M6 × P1.0	M8 × P1.25	M10 × P1.5	M10 × P1.5	M10 × P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265
	C8	61	77 · 85	115.3 · 129.8	141 · 151	165.7	235 · 237	235 · 237
	C9	83	108 · 116	160.3 · 174.8	201 · 211	236.7	325 · 327	345 · 347

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	44	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	17	54	145	301	553	1,067	1,786
			4	15	48	128	269	491	940	1,587
			5	14	45	132	278	510	1,050	1,770
			6	13	41	125	252	466	985	1,680
			7	13	41	123	258	473	975	1,645
			8	12	39	115	241	442	942	1,605
			9	11	40	120	227	412	875	1,490
			10	12	40	116	246	452	930	1,565
			12	13	41	125	252	466	985	1,680
			14	13	41	123	258	473	975	1,645
			16	12	39	115	241	442	942	1,605
			18	11	40	120	227	412	875	1,490
			20	12	40	116	246	452	930	1,565
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 20	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 20	3 倍額定輸出扭矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{IN}	rpm	3 ~ 20	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{IB}	rpm	3 ~ 20	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash		arcmin	3 ~ 20	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 20	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 20	360	1,120	3,040	6,460	8,830	14,820	48,450
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 20	180	560	1,520	3,230	4,410	7,410	24,225
使用壽命 Service Life	L_H	hr	3 ~ 20	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	3 ~ 20	≥ 95%						
使用溫度 Operating Temperature		°C	3 ~ 20	-25° C ~ +90° C						
潤滑 Lubrication			3 ~ 20	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			3 ~ 20	IP65						
安裝方向 Mounting Position			3 ~ 20	任意方向 Any						
噪音值 Noise Level		dB	3 ~ 20	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	3 ~ 20	0.99	2.1	6.88	12.5	23.16	51	75.2

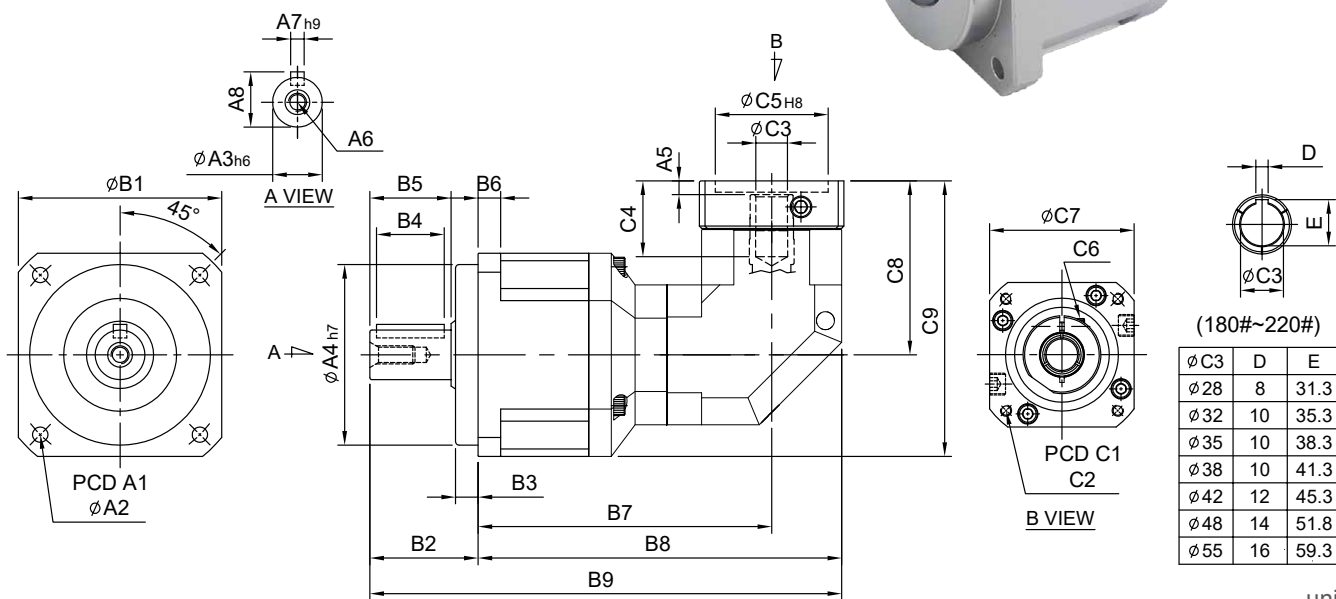
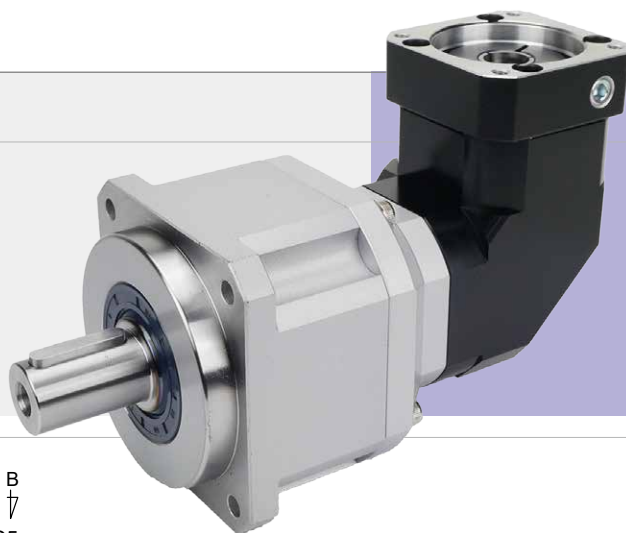
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	44	62	90	120	142	180	220
3	0.09	0.36	2.28	6.85	23.5	68.2	135.0
4	0.09	0.36	2.28	6.85	23.5	68.2	135.0
5	0.09	0.36	2.28	6.85	23.5	68.2	135.0
6	0.09	0.36	2.28	6.85	23.5	68.2	135.0
7	0.09	0.36	2.28	6.85	23.5	68.2	135.0
8	0.09	0.36	2.28	6.85	23.5	68.2	135.0
9	0.09	0.36	2.28	6.85	23.5	68.2	135.0
10	0.09	0.36	2.28	6.85	23.5	68.2	135.0
12	0.03	0.08	1.88	6.20	21.8	65.5	119.2
14	0.03	0.08	1.88	6.20	21.8	65.5	119.2
16	0.03	0.08	1.88	6.20	21.8	65.5	119.2
18	0.03	0.08	1.88	6.20	21.8	65.5	119.2
20	0.03	0.08	1.88	6.20	21.8	65.5	119.2

MODEL : PBL

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70,
80, 90, 100, 120, 140, 160, 180, 200



unit: mm

	Model Code						
		62	90	120	142	180	220
A	A1	70	100	130	165	215	250
	A2	5.5	6.8	9	11	13	17
	A3	16	22	32	40	55	75
	A4	50	80	110	130	160	180
	A5	6	6	9・23.5	10・20	10	12.5・14.5
	A6	M5 × P0.8	M8 × P1.25	M10 × P1.5	M12 × P1.75	M14 × P2.0	M16 × P2.0
	A7	5	6	10	12	16	20
	A8	18	24.5	35	43	59	79.5
B	B1	62	90	120	142	180	220
	B2	36	48	65	92	106	139
	B3	7	10	12	15	20	30
	B4	20	30	40	65	70	90
	B5	28	36	50	74	82	104
	B6	8	10	12	15	16	20
	B7	110.5	130	181.6	214.5	249.5	313.6
	B8	132.5	161	266.6	274.5	320.5	403.6
	B9	168.5	209	291.6	366.5	426.5	542.6
C	C1	46・60・63	70・75・90	90・110・115・145	115・145・165	145・165・215	200・215・265
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8・M10	M6・M8・M10	M8・M10・M12	M10・M12・M16
	C3	8・11	11・14・16・19	16・19・22・24	24・28・32	28・32・35・38	35・38・42・48・55
	C4	27	33.5・42	53・67.5	67・77	85	117・119
	C5	30・40・50	50・60・70	70・80・95・110	70・95・110・130	110・130・180	114.3・180・230
	C6	M4 × P0.7	M5 × P0.8	M6 × P1.0	M8 × P1.25	M10 × P1.5	M10 × P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190	182・200・250
	C8	61	77・85	115.3・129.8	141・151	165.7	235・237
	C9	92	122・130	175.3・189.8	212・222	255.7	345・347

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	54	145	301	553	1,067	1,786
			20	48	128	269	491	940	1,587
			25	45	132	278	510	1,050	1,770
			30	41	125	252	466	985	1,680
			35	41	123	258	473	975	1,645
			40	39	115	241	442	942	1,605
			50	45	132	278	510	1,050	1,770
			60	41	125	252	466	985	1,680
			70	41	123	258	473	975	1,645
			80	40	115	241	442	942	1,605
			90	40	120	227	412	875	1,490
			100	40	116	246	452	930	1,565
			120	41	125	252	466	985	1,680
			140	41	123	258	473	975	1,645
			160	40	115	241	442	942	1,605
			180	40	120	227	412	875	1,490
			200	40	116	246	452	930	1,565
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 200	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque					
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 200	3 倍額定輸出扭矩 3 Times of Rated Output Torque					
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 200	6,000	6,000	6,000	5,000	5,000	4,000
背隙 Backlash		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 200	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 200	1,120	3,040	6,460	8,830	14,820	48,450
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 200	560	1,520	3,230	4,410	7,410	24,225
使用壽命 Service Life	L_H	hr	15 ~ 200	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
效率 Efficiency	η	%	15 ~ 200	≥ 92%					
使用溫度 Operating Temperature		°C	15 ~ 200	-25° C ~ +90° C					
潤滑 Lubrication			15 ~ 200	全合成潤滑油脂 Synthetic Grease					
防護等級 Protection Class			15 ~ 200	IP65					
安裝方向 Mounting Position			15 ~ 200	任意方向 Any					
噪音值 Noise Level		dB	15 ~ 200	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	15 ~ 200	2	6.1	12.5	23.2	41.4	73

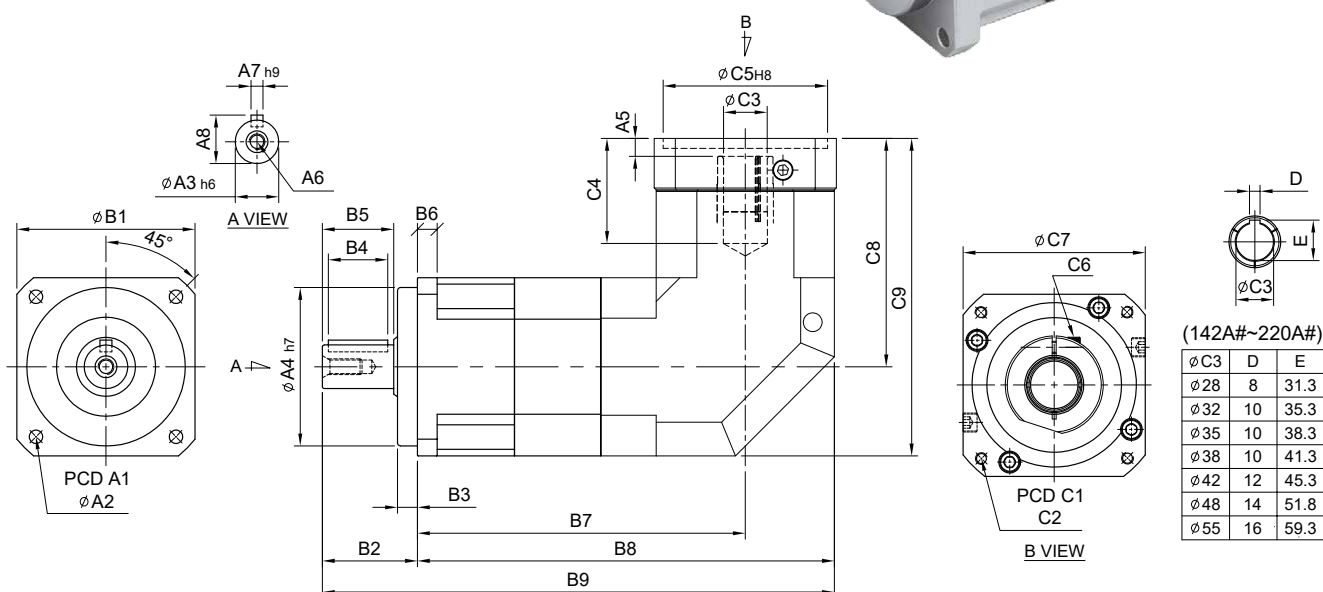
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	62	90	120	142	180	220
15	0.09	0.36	2.28	6.85	26.2	70.1
20	0.09	0.36	2.28	6.85	26.2	70.1
25	0.09	0.36	2.28	6.85	23.1	68.2
30	0.09	0.36	2.28	6.85	23.1	68.2
35	0.09	0.36	2.28	6.85	23.1	68.2
40	0.09	0.36	2.28	6.85	23.1	68.2
50	0.09	0.36	2.28	6.85	23.1	68.2
60	0.09	0.36	2.28	6.85	23.1	68.2
70	0.09	0.36	2.28	6.85	23.1	68.2
80	0.09	0.36	2.28	6.85	23.1	68.2
90	0.09	0.36	2.28	6.85	23.1	68.2
100	0.09	0.36	2.28	6.85	23.1	68.2
120	0.03	0.10	1.88	6.20	21.2	65.1
140	0.03	0.10	1.88	6.20	21.2	65.1
160	0.03	0.10	1.88	6.20	21.2	65.1
180	0.03	0.10	1.88	6.20	21.2	65.1
200	0.03	0.10	1.88	6.20	21.2	65.1

MODEL : PBL-A

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 60, 70,
80, 90, 100, 120, 140, 160, 180, 200



unit: mm

	Model Code	44A	62A	90A	120A	142A	180A	220A
A	A1	50	70	100	130	165	215	250
	A2	4.5	5.5	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	6	6	9 · 23.5	10 · 20	10	12.5 · 14.5	12.5 · 14.5
	A6	M4 × P0.7	M5 × P0.8	M8 × P1.25	M10 × P1.5	M12 × P1.75	M14 × P2.0	M16 × P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
	A9	15	18	24.5	35	43	59	79.5
B	B1	44	62	90	120	142	180	220
	B2	26	36	48	65	92	106	139
	B3	5	7	10	12	15	20	30
	B4	15	20	30	40	65	70	90
	B5	20	28	36	50	74	82	104
	B6	5	8	10	12	15	16	20
	B7	102	118.3	165.6	204	232	304.6	324.6
	B8	124	149.3	210.6	264	303	394.6	434.6
	B9	150	185.3	258.6	329	395	500.6	573.6
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265	200 · 265 · 300
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
	C3	8 · 11	11 · 14 · 16 · 19	16 · 19 · 22 · 24	24 · 28 · 32	28 · 32 · 35 · 38	35 · 38 · 42 · 48 · 55	38 · 42 · 48 · 55
	C4	27	33.5 · 42	53 · 67.5	67 · 77	85	117 · 119	117 · 119
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M4 × P0.7	M5 × P0.8	M6 × P1.0	M8 × P1.25	M10 × P1.5	M10 × P1.5	M10 × P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	220 · 250 · 265
	C8	61	77 · 85	115.3 · 129.8	141 · 151	165.7	235 · 237	235 · 237
	C9	83	108 · 116	160.3 · 174.8	201 · 211	236.7	325 · 327	345 · 347

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	44A	62A	90A	120A	142A	180A	220A
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	17	54	145	301	553	1,067	1,786
			20	15	48	128	269	491	940	1,587
			25	14	45	132	278	510	1,050	1,770
			30	13	41	125	252	466	985	1,680
			35	13	41	123	258	473	975	1,645
			40	12	39	115	241	442	942	1,605
			50	11	45	132	278	510	1,050	1,770
			60	12	41	125	252	466	985	1,680
			70	13	41	123	258	473	975	1,645
			80	13	40	115	241	442	942	1,605
			90	12	40	120	227	412	875	1,490
			100	11	40	116	246	452	930	1,565
			120	12	41	125	252	466	985	1,680
			140	13	41	123	258	473	975	1,645
			160	13	39	115	241	442	942	1,605
			180	12	40	120	227	412	875	1,490
			200	11	40	116	246	452	930	1,565
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 200	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 200	3 倍額定輸出扭矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000	3,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 200	6,000	6,000	6,000	5,000	5,000	4,000	3,000
背隙 Backlash		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 200	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 200	360	1,120	3,040	6,460	8,830	14,820	48,450
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 200	180	560	1,520	3,230	4,410	7,410	24,225
使用壽命 Service Life	L_H	hr	15 ~ 200	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	15 ~ 200	≥ 92%						
使用溫度 Operating Temperature		°C	15 ~ 200	-25° C ~ +90° C						
潤滑 Lubrication			15 ~ 200	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			15 ~ 200	IP65						
安裝方向 Mounting Position			15 ~ 200	任意方向 Any						
噪音值 Noise Level		dB	15 ~ 200	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
重量 Weight ±3%		Kg	15 ~ 200	1.5	3	8.15	13.9	29.4	52.4	94.5

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	44A	62A	90A	120A	142A	180A	220A
15	0.09	0.36	2.28	6.85	23.5	55.2	80.2
20	0.09	0.36	2.28	6.85	23.5	55.2	80.2
25	0.09	0.36	2.28	6.85	23.5	50.4	76.5
30	0.09	0.36	2.28	6.85	23.5	50.4	76.5
35	0.09	0.36	2.28	6.85	23.5	50.4	76.5
40	0.09	0.36	2.28	6.85	23.5	50.4	76.5
50	0.09	0.36	2.28	6.85	23.5	50.4	76.5
60	0.09	0.36	2.28	6.85	23.5	50.4	76.5
70	0.09	0.36	2.28	6.85	23.5	50.4	76.5
80	0.09	0.36	2.28	6.85	23.5	50.4	76.5
90	0.09	0.36	2.28	6.85	23.5	50.4	76.5
100	0.09	0.36	2.28	6.85	23.5	50.4	76.5
120	0.03	0.08	1.88	6.20	21.8	48.7	74.2
140	0.03	0.08	1.88	6.20	21.8	48.7	74.2
160	0.03	0.08	1.88	6.20	21.8	48.7	74.2
180	0.03	0.08	1.88	6.20	21.8	48.7	74.2
200	0.03	0.08	1.88	6.20	21.8	48.7	74.2

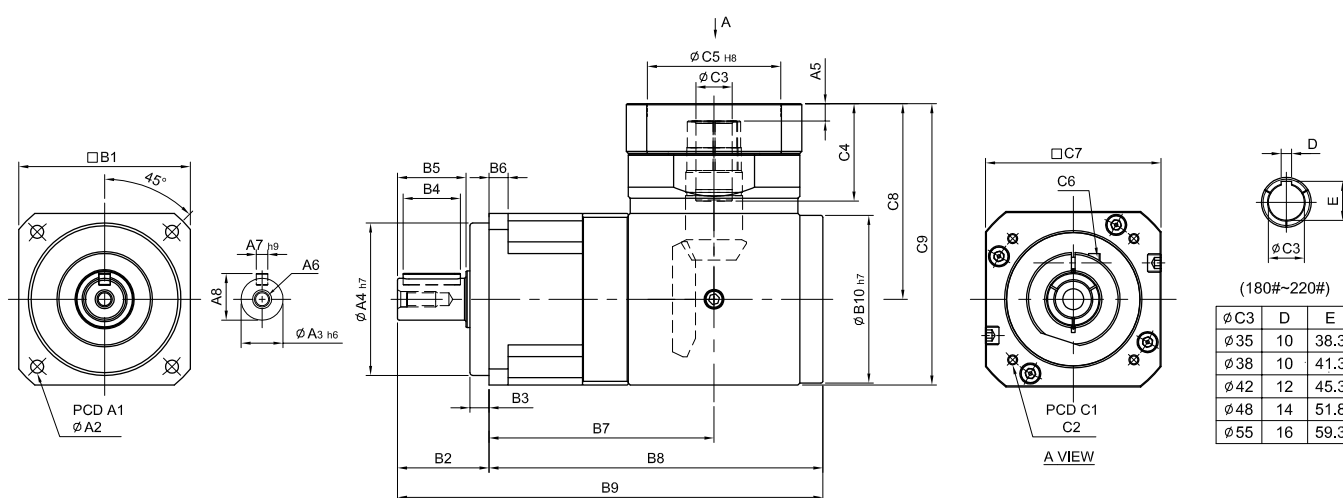
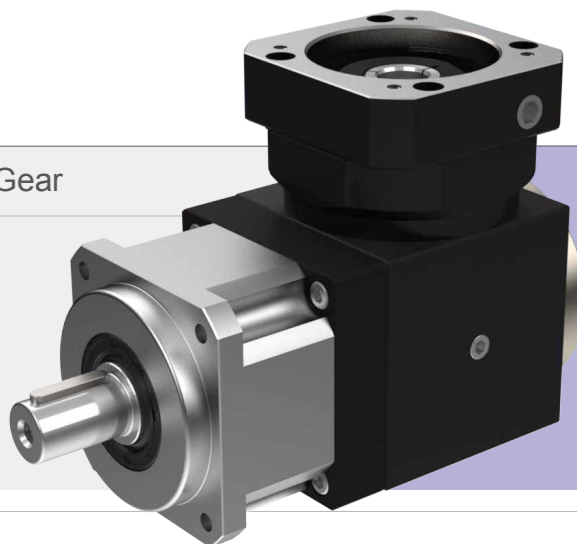
FABGEAR Planetary Reducers

螺旋齒輪 Helical Gear & 螺旋傘齒輪 Spiral Bevel Gear

MODEL : PBT

單段 1-Stage

RATIO : 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25,
30, 35, 40, 45, 50



unit: mm

	Model Code	unit: mm						
		44	62	90	120	142	180	220
A	A1	50	70	100	130	165	215	250
	A2	4.5	5.5	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	5	7	9 · 23.5	9 · 23.5	10	9.5	14 · 16
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
	B1	44	62	90	120	142	180	220
	B2	26	36	48	65	92	106	139
B	B3	5	7	10	12	15	20	30
	B4	15	20	30	40	65	70	90
	B5	20	28	36	50	74	82	104
	B6	5	8	10	12	15	16	20
	B7	67.5	87.5	118	145	175	207	237
	B8	99.5	128	175	215	260	307	360
	B9	125.5	164	223	280	352	413	499
	B10	48	62	88	106	135	164	205
	C1	46	70 · 75 · 90	90 · 100 · 115 · 145	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265
	C2	M4	M4 · M5 · M6	M5 · M6 · M8	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16
	C3	8	11 · 14	19 · 24	22 · 24	28 · 32 · 35	35 · 38	42 · 48 · 55
	C4	26	36	51 · 65.5	51 · 65.5	68	84.5	117 · 119
	C5	30	50 · 60 · 70	70 · 80 · 95 · 110	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
	C7	42	64 · 70 · 80	92 · 110 · 130	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250
	C8	57	77	103 · 117	122 · 136	154	189	252 · 254
	C9	82	110	148 · 162	182 · 196	225	279	362 · 364

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	44	62	90	120	142	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	17	54	145	301	553	1,067	1,786
			4	15	48	128	269	491	940	1,587
			5	14	45	132	278	510	1,050	1,770
			6	17	54	145	301	553	1,067	1,786
			7	13	41	123	258	473	975	1,645
			8	15	48	128	269	491	940	1,587
			9	17	54	145	301	553	1,067	1,786
			10	14	45	132	278	510	1,050	1,565
			15	14	45	132	278	510	1,050	1,786
			20	14	45	132	278	510	1,050	1,587
			25	14	45	132	278	510	1,050	1,770
			30	13	41	125	252	466	985	1,680
			35	13	41	123	258	473	975	1,645
			40	12	39	115	241	442	942	1,605
			45	11	40	120	227	412	875	1,490
			50	12	40	116	246	452	930	1,565
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 50	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque	T_{2NOT}	Nm	3 ~ 50	3 倍額定輸出扭矩 3 Times of Rated Output Torque						
急停扭矩 Emergency Stop Torque										
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 50	3,000	3,000	3,000	2,500	2,500	2,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 50	6,000	6,000	5,500	4,500	3,500	3,000	3,000
背隙 Backlash		arcmin	3 ~ 50	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 50	3	6	14	27	60	140	240
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 50	360	1,120	3,040	6,460	8,830	14,820	48,450
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 50	180	560	1,520	3,230	4,410	7,410	24,225
使用壽命 Service Life	L_H	hr	3 ~ 50	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation : >30,000 (S1 Continuous Operation : >15,000 hrs)						
效率 Efficiency	η	%	3 ~ 50	$\geq 95\%$						
使用溫度 Operating Temperature		°C	3 ~ 50	-25° C ~ +90° C						
潤滑 Lubrication			3 ~ 50	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			3 ~ 50	IP65						
安裝方向 Mounting Position			3 ~ 50	任意方向 Any						
噪音值 Noise Level		dB	3 ~ 50	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 76
重量 Weight $\pm 3\%$		Kg	3 ~ 50	1.2	2	7	13	24	48	78

轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	44	62	90	120	142	180	220
3	0.09	0.36	2.28	6.85	23.5	68	135
4	0.09	0.36	2.28	6.85	23.5	68	135
5	0.09	0.36	2.28	6.85	23.5	68	135
6	0.09	0.36	2.28	6.85	23.5	68	135
7	0.09	0.36	2.28	6.85	23.5	68	135
8	0.09	0.36	2.28	6.85	23.5	68	135
9	0.09	0.36	2.28	6.85	23.5	68	135
10	0.09	0.36	2.28	6.85	23.5	68	135
15	0.06	0.22	2.05	6.21	21.2	61	135
20	0.06	0.22	2.05	6.21	21.2	61	135
25	0.06	0.22	2.05	6.21	21.2	61	135
30	0.06	0.22	2.05	6.21	21.2	61	135
35	0.06	0.22	2.05	6.21	21.2	61	135
40	0.06	0.22	2.05	6.21	21.2	61	135
45	0.06	0.22	2.05	6.21	21.2	61.3	135
50	0.06	0.22	2.05	6.21	21.2	61	135

行星減速機搭配傘齒輪減速機型號及速比一覽表 The Model & Ratio Table of Precision Planetary Reducer Assembly Bevel Gear Reducer

型號 Model	減速比 Ratio	法蘭盤框號 Flange Model	傘齒輪減速機 Bevel Gear Reducer Model
44	3、4、5、6、7 8、9、10、15、20 25、30、35、40 45、50	44	-
62		62	ST65
90		90	ST90
120		90	ST110
142		120	ST140
180		142	ST170
220		180	ST210

Indication of Model Numbers

機種型號表示

SN	80	10		MOTOR
減速機型 Type	型號 Model	速比 Ratio	出力軸鍵槽 Output Shaft	馬達型號 Motor Type
SN	50	單段 1-Stage	☐ 標準品，有鍵槽 Standard (Keyway)	
SNL	60	3, 4, 5, 7, 10		
	70	雙段 2-Stage	N: 實心軸，無鍵槽 Solid Output Shaft (No Keyway)	
	80	15, 20, 25, 30, 35, 40,		
	90	50, 70, 100		
	115			
	120	單段 1-Stage (SNL)		
	155	3, 4, 5, 6, 7, 8, 9, 10, 15, 20,		
	160	25, 30, 35, 40, 50		

SN

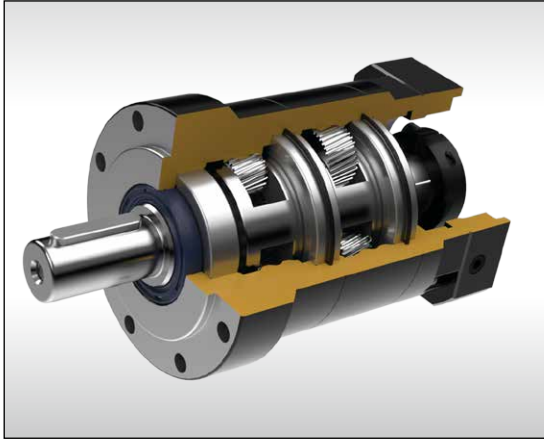


SNL



Features of SN Series

SN 系列產品特點



螺旋齒輪設計及高精度齒輪加工

減速機構採用螺旋齒輪設計，齒形嚙合率為一般正齒輪的二倍以上，具有運轉平順、低噪音、高輸出扭矩和低背隙的特性。

材料採用高級鎳鉻鉬合金鋼 (SNCM220)，切削加工後，經滲碳熱處理至硬度 57~60HRC，再進行齒面研磨，確保齒輪精度 DIN6 級以內。

Helical Gear Design

The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also features extremely smooth running, low noise, high torque output and low backlash.

High Precision Gear Machining

Manufactured from high quality Ni-Cr-Mo alloy steel (SNCM220), precision achined and carburized to hardness 57-60 HRC. Precision teeth grinding sure gear accuracy reaches DIN6 class.



一體式行星臂架

行星臂架與輸出軸採一體式的結構設計，以確保提高扭轉剛性及精確度。

Integrated Planetary Arm Bracket

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy.

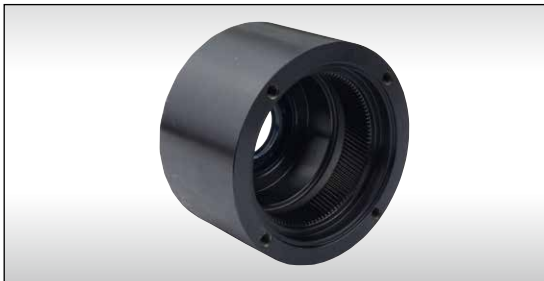


滿針滾針軸承設計

行星齒輪的傳動介面採用不含保持器之滿針滾針軸承，增加接觸面積以提高結構剛性及使用壽命。

Full Needle Roller Bearings Design

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.



一體式齒輪箱本體

齒輪箱和內環齒輪採一體式的設計。提高結構剛性及輸出扭矩。

One-piece Gear Box & Advanced Surface Treatment

The gear box and internal ring gear are one-piece constructed to achieve high rigidity and high torque.



筒夾式連結機構

輸入端與馬達的連結採用筒夾式的鎖緊機構，並經動平衡分析，以確保在高輸入轉速下結合介面的同心度和平衡度，及零背隙的動力傳遞。

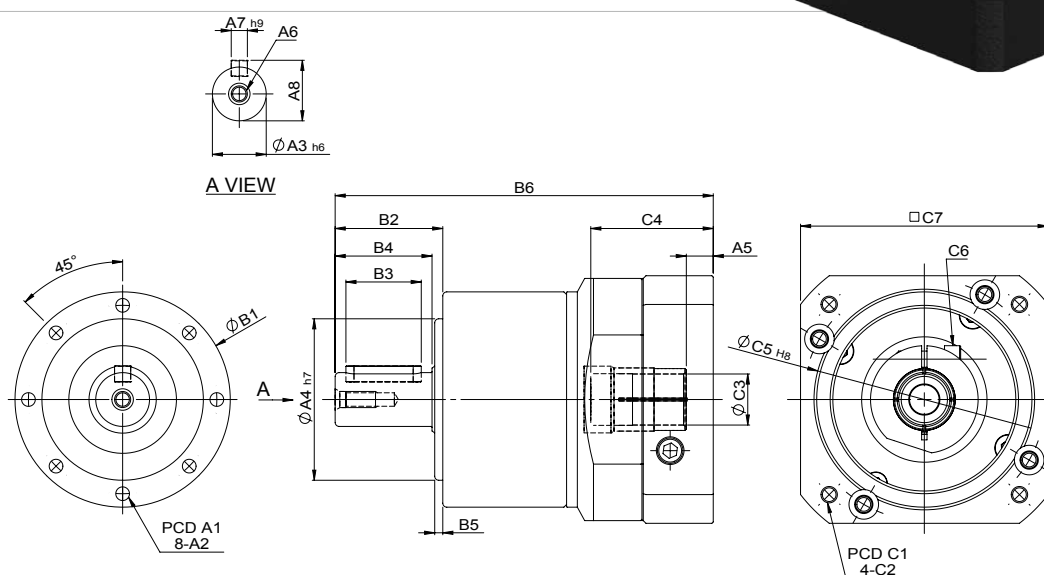
Collet Locking Mechanism

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.

MODEL : SN

單段 1-Stage

RATIO : 3, 4, 5, 7, 10



unit: mm

	Model Code	42	50	60	70	80	90	115	120	155	160
		35	44	52	62	70	80	100	108	140	145
A	A1	35	44	52	62	70	80	100	108	140	145
	A2	4-M4 x P0.7	M4 x P0.7	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M10 x P1.5	M8 x P1.25	M10 x P1.5	M12 x P1.75
	A3	8	12	14	16	20	22	25	32	40	40
	A4	25	35	40	52	60	68	80	90	120	130
	A5	6	4.5	4.5	6	10	9 · 23.5	8 · 22.5	10	10	10
	A6	M3 x P0.5	M4 x P0.7	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M8 x P1.25	M12 x P1.75	M12 x P1.75	M12 x P1.75
	A7	-	4	5	5	6	6	8	10	12	12
	A8	-	13.5	16	18	22.5	24.5	28	35	43	43
B	B1	42	51	60	70	80	90	115	122	155	160
	B2	25	25.5	34	36	40	46	56	70	88	88
	B3	-	15	25	20	28	30	40	50	65	65
	B4	22	20	30	28	36	36	50	58	78	78
	B5	2	4	3	6.5	3	8	4	9	8	8
	B6	87.5	96.5	108	115	140.5	155.5 · 170	173.5 · 188	211 · 221	238.5 260.5	238.5 260.5
C	C1	43.84	45 · 46 · 48.5 · 63 · 70	45 · 46 · 48.5 · 63 · 70	70 · 75 · 90	90 · 100 · 115 · 145	90 · 100 · 115 · 145	90 · 100 · 115 · 145	115 · 145 · 165	115 · 145 · 165 145 · 165 · 200	115 · 145 · 165 145 · 165 · 200
	C2	3.5	M3 · M4 · M5	M3 · M4 · M5	M5 · M6	M6 · M8	M6 · M8	M6 · M8	M6 · M8 · M10	M6 · M8 · M10 M8 · M10 · M12	M6 · M8 · M10 M8 · M10 · M12
	C3	5	8 · 10 · 11 · 14	8 · 9 · 10 · 12.7 · 14	11 · 14 · 16 · 19	14 · 16 · 19	19 · 24	19 · 22 · 24	24 · 28 · 32	24 · 28 · 32 35 · 38	24 · 28 · 32 35 · 38
	C4	27	32	32	33.5	45.5	51 · 65.5	51 · 65.5	67 · 77	63 84.5	63 84.5
	C5	22	30 · 40 · 50	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	70 · 80 · 95 · 110	70 · 80 · 95 · 110	95 · 110 · 130	95 · 110 · 130 110 · 130 · 180	95 · 110 · 130 110 · 130 · 180
	C6	M4 x P0.7	M4 x P0.7	M4 x P0.7	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M8 x P1.25 M10 x P1.5	M8 x P1.25 M10 x P1.5
	C7	42	46 · 55 · 60	46 · 55 · 60	70 · 75 · 80	92 · 110 · 130	92 · 110 · 130	92 · 110 · 130	122 · 130 · 150	122 · 130 · 150 146 · 150 · 190	122 · 130 · 150 146 · 150 · 190

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	42	50	60	70	80	90	115	120	155	160
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3		17	28	54	112	146	165	301	553	625
			4		15	38	48	110	144	146	269	491	555
			5		14	40	45	108	140	160	278	510	618
			7		13	35	41	105	128	149	258	473	573
			10		12	25	40	100	123	141	246	452	549
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 10	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque									
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque									
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 10		3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 10		6,000	6,000	6,000	6,000	6,000	6,000	5,000	5,000	5,000
背隙 Backlash		arcmin	3 ~ 10		≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 10		3	4	5	12	13	14	27	49	60
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 10		670	1,030	1,760	2,350	2,920	3,500	6,100	8,830	9,200
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 10		335	515	880	1,175	1,460	1,750	3,050	4,415	4,600
使用壽命 Service Life	L_H	hr	3 ~ 10	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)									
效率 Efficiency	η	%	3 ~ 10	≥ 97%									
使用溫度 Operating Temperature		°C	3 ~ 10	- 25° C ~ + 90° C									
潤滑 Lubrication			3 ~ 10	全合成潤滑油脂 Synthetic Grease									
防護等級 Protection Class			3 ~ 10	IP65									
安裝方向 Mounting Position			3 ~ 10	任意方向 Any									
噪音值 Noise Level		dB	3 ~ 10		≤ 58	≤ 58	≤ 58	≤ 60	≤ 60	≤ 63	≤ 63	≤ 65	≤ 65
重量 Weight ±2%		Kg	3 ~ 10		0.73	0.99	1.25	2.1	2.8	4.98	6.7	13.6	15

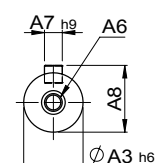
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	60	70	80	90	115	120	155	160
3	0.03	0.06	0.15	0.48	0.55	0.60	3.01	8.14	9.21
4	0.03	0.06	0.15	0.38	0.42	0.45	2.52	6.63	7.42
5	0.03	0.06	0.13	0.38	0.42	0.45	2.52	6.63	7.42
7	0.03	0.06	0.13	0.38	0.42	0.45	2.31	6.55	7.14
10	0.03	0.06	0.13	0.35	0.38	0.41	2.3	6.46	7.03

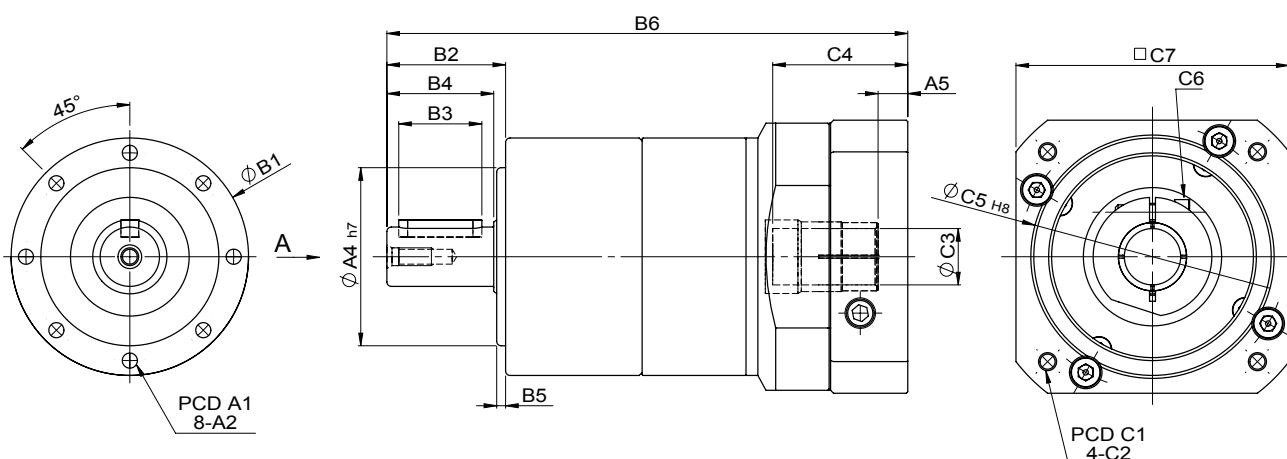
MODEL : SN

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 70, 100



A VIEW



unit: mm

	Model Code	50	60	70	80	90	115	120	155	160
A	A1	44	52	62	70	80	100	108	140	145
	A2	M4 x P0.7	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M10 x P1.5	M8 x P1.25	M10 x P1.5	M12 x P1.75
	A3	12	14	16	20	22	25	32	40	40
	A4	35	40	52	60	68	80	90	120	130
	A5	4.5	4.5	6	10	9 · 23.5	8 · 22.5	10	10	10
	A6	M4 x P0.7	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M8 x P1.25	M12 x P1.75	M12 x P1.75	M12 x P1.75
	A7	4	5	5	6	6	8	10	12	12
	A8	13.5	16	18	22.5	24.5	28	35	43	43
B	B1	51	60	70	80	90	115	122	155	160
	B2	25.5	34	36	40	46	56	70	88	88
	B3	15	25	20	28	30	40	50	65	65
	B4	20	30	28	36	36	50	58	78	80
	B5	4	3	6.5	3	8	4	9	8	8
	B6	122.5	134	148.8	175.5	190.5 · 205	217 · 231.5	257 · 267	298.5	298.5
C	C1	45 · 46 · 48.5 · 63 · 70	45 · 46 · 48.5 · 63 · 70	70 · 75 · 90	90 · 100 · 115 · 145	90 · 100 · 115 · 145	90 · 100 · 115 · 145	115 · 145 · 165	115 · 145 · 165	115 · 145 · 165
	C2	M3 · M4 · M5	M3 · M4 · M5	M5 · M6	M6 · M8	M6 · M8	M6 · M8	M6 · M8 · M10	M6 · M8 · M10	M6 · M8 · M10
	C3	8 · 10 · 11 · 14	8 · 9 · 10 · 12.7 · 14	11 · 14 · 16 · 19	14 · 16 · 19	19 · 24	19 · 22 · 24	24 · 28 · 32	24 · 28 · 32	24 · 28 · 32
	C4	32	32	33.5	45.5	51 · 65.5	51 · 65.5	67 · 77	67	67
	C5	30 · 40 · 50	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	70 · 80 · 95 · 110	70 · 80 · 95 · 110	95 · 110 · 130	95 · 110 · 130	95 · 110 · 130
	C6	M4 x P0.7	M4 x P0.7	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M8 x P1.25	M8 x P1.25
	C7	46 · 55 · 60	46 · 55 · 60	70 · 75 · 80	92 · 110 · 130	92 · 110 · 130	92 · 110 · 130	122 · 130 · 150	122 · 130 · 150	122 · 130 · 150

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	60	70	80	90	115	120	155	160
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	17	28	54	112	146	165	301	553	625
			20	15	38	48	110	144	146	269	491	555
			25	14	40	45	108	140	160	278	510	618
			30	17	28	54	112	146	165	301	553	625
			35	13	35	41	105	128	149	258	473	618
			40	15	38	48	110	144	146	269	491	555
			50	14	40	45	108	140	160	278	510	618
			70	13	35	41	105	128	149	258	473	573
			100	12	25	40	100	123	141	246	452	549
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque								
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque								
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	6,000	6,000	6,000	6,000	6,000	6,000	5,000	5,000	5,000
背隙 Backlash		arcmin	15 ~ 100	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	3	4	5	12	13	14	27	49	60
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	670	1,030	1,760	2,350	2,920	3,500	6,100	8,830	9,200
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	335	515	880	1,175	1,460	1,750	3,050	4,415	4,600
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)								
效率 Efficiency	η	%	15 ~ 100	≥ 94%								
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C								
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease								
防護等級 Protection Class			15 ~ 100	IP65								
安裝方向 Mounting Position			15 ~ 100	任意方向 Any								
噪音值 Noise Level		dB	15 ~ 100	≤ 60	≤ 60	≤ 60	≤ 62	≤ 62	≤ 65	≤ 65	≤ 67	≤ 67
重量 Weight ±2%		Kg	15 ~ 100	1.05	1.46	1.9	3.2	4.48	6.92	9.84	17	18.5

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

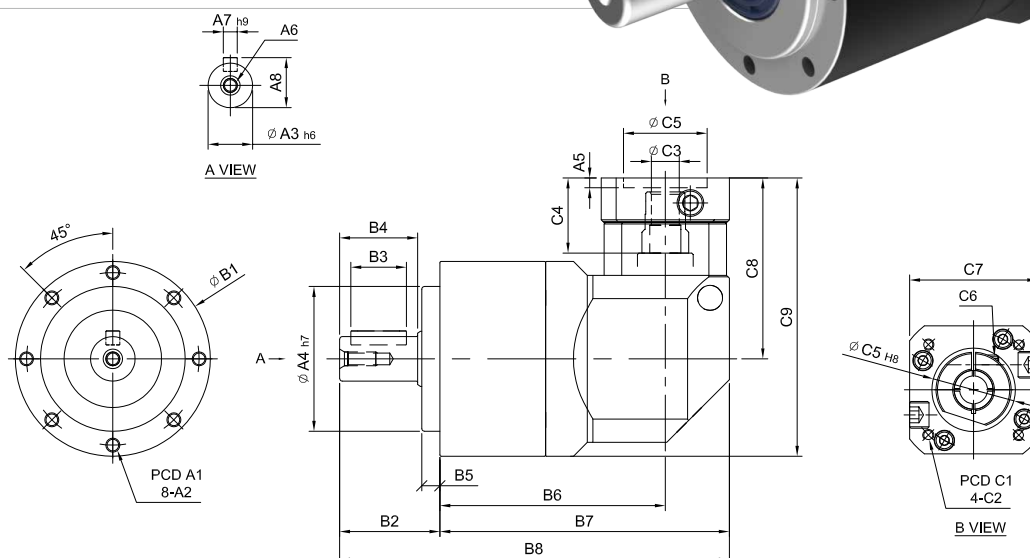
Ratio	50	60	70	80	90	115	120	155	160
15	0.025	0.05	0.11	0.29	0.38	0.40	2.71	7.81	8.68
20	0.025	0.05	0.11	0.29	0.38	0.40	2.29	6.27	7.08
25	0.025	0.05	0.11	0.29	0.38	0.40	2.29	6.01	6.97
30	0.025	0.05	0.11	0.29	0.38	0.40	2.71	7.81	8.65
35	0.025	0.05	0.11	0.29	0.38	0.40	2.17	5.92	6.71
40	0.025	0.05	0.11	0.29	0.38	0.40	2.29	6.27	7.08
50	0.025	0.05	0.11	0.29	0.38	0.40	2.29	6.01	6.97
70	0.025	0.05	0.11	0.29	0.38	0.40	2.17	5.92	6.71
100	0.025	0.05	0.11	0.26	0.32	0.38	2.11	5.80	6.61

FABGEAR Planetary Reducers

MODEL : SNL

單段 1-Stage

RATIO : 3, 4, 5, 6, 7, 8, 9, 10, 15, 20,
25, 30, 35, 40, 50



unit: mm

	Model Code	50	60	70			80		90		120		155	160
	A1	44	52	62			70		80		108		140	145
A	A2	M4xP0.7	M5xP0.8	M5xP0.8			M6xP1.0		M6xP1.0		M8xP1.25		M10xP1.5	M12xP1.75
	A3	12	14	16			20		22		32		40	40
	A4	35	40	52			60		68		90		120	130
	A5	6	6	5	3.5	6	7	9	7	9	9・23.5	10・20	10	10
	A6	M4xP0.7	M4xP0.7	M5xP0.8			M6xP1.0		M8xP1.25		M12xP1.75		M12xP1.75	M12xP1.75
	A7	4	5	5			6		6		10		12	12
	A8	13.5	16	18			22.5		24.5		35		43	43
	B	B1	51	60	70			80		90		122		155
B2		25.5	34	36			40		46		70		88	88
B3		15	25	20			28		30		50		65	65
B4		20	30	28			36		36		58		78	78
B5		4	3	6.5			3		8		9		8	8
B6		68.5	72	81			92		95.5		128		180	180
B7		90.5	94	104			123.5		127		173		242.5	242.5
B8		116	128	140			163.5		173		243		330.5	330.5
C	C1	46・63	46・63	70		90	70	90・100・145	70	90・100・145	90・100・145	145・165	165・200	165・200
	C2	M4・M5	M4・M5	M4・M5	M5・M6	M4・M5	M6・M8	M4・M5	M6・M8	M6・M8	M8・M10	M10・M12	M8・M10・M12	
	C3	8・11	8・11	11	14	19	14	19・22・24	14	19・22・24	19・22・24	28・32	35・38	35・38
	C4	26	26	27	32	42	36	53	36	51・65.5	51・65.5	67・77	81.5	81.5
	C5	30・40	30・40	50		70	50	70・80・110	50	70・80・110	70・80・110	110・130	114.3・130	114.3・130
	C6	M4xP0.7	M4xP0.7	M4xP0.7	M5xP0.8	M5xP0.8	M6xP1.0	M5xP0.8	M6xP1.0	M6xP1.0	M8xP1.25	M8xP1.25	M8xP1.25	
	C7	46・55	46・55	60		80	60	92・110・130	60	92・110・130	92・110・130	130・150	150・180	150・180
	C8	59	59	65	70	80	77	97	77	97	102.5	123.5	168	168
	C9	84.5	89	100	105	115	117	137	122	142	163.5	184.5	248	248

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	60	70	80	90	120	155	160
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	17	28	54	112	146	301	553	625
			4	15	38	48	110	144	269	491	555
			5	14	40	45	108	140	278	510	618
			6	17	28	54	112	146	301	553	625
			7	13	35	41	105	128	258	473	573
			8	15	38	48	110	144	269	491	555
			9	17	28	54	112	146	301	553	625
			10	14	40	45	108	140	278	510	618
			15	14	40	45	108	140	278	510	618
			20	14	40	45	108	140	278	510	618
			25	14	40	45	108	140	278	510	618
			30	12	25	40	100	123	246	452	549
			35	13	35	41	105	128	258	473	573
			40	12	25	40	100	123	246	452	549
			50	12	25	40	100	123	246	452	549
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 50	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque							
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 50	3 倍額定輸出力矩 3 Times of Rated Output Torque							
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 50	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 50	6,000	6,000	6,000	6,000	6,000	6,000	5,000	5,000
背隙 Backlash		arcmin	3 ~ 50	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 50	3	4	5	12	14	27	49	60
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 50	670	1,030	1,760	2,350	2,920	6,100	8,830	9,200
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 50	335	515	880	1,175	1,460	3,050	4,415	4,600
使用壽命 Service Life	L_H	hr	3 ~ 50	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)							
效率 Efficiency	η	%	3 ~ 50	≥ 94%							
使用溫度 Operating Temperature		°C	3 ~ 50	- 25° C ~ + 90° C							
潤滑 Lubrication			3 ~ 50	全合成潤滑油脂 Synthetic Grease							
防護等級 Protection Class			3 ~ 50	IP65							
安裝方向 Mounting Position			3 ~ 50	任意方向 Any							
噪音值 Noise Level		dB	3 ~ 50	≤ 65	≤ 66	≤ 68	≤ 70	≤ 71	≤ 72	≤ 74	≤ 74
重量 Weight ±2%		Kg	3 ~ 50	1.0	1.3	1.9	3	3.6	8.6	22	23

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	60	70	80	90	120	155	160
3~50	0.09	0.11	0.83	1.19	1.37	5.49	20.32	25.76



Indication of Model Numbers

機種型號表示

FA	80	10			MOTOR
減速機型 Type	型號 Model	速比 Ratio	出力軸鍵槽 Output Shaft	入力軸鍵槽 Input Shaft	馬達型號 Motor Type
FA	50 70 80 90 100 120 142 180	單段 1-Stage 3, 4, 5, 7, 10 雙段 2-Stage 15, 20, 25, 30, 35, 40, 50, 70, 100	☐ 標準品，有鍵槽 Standard (Keyway) N: 實心軸，無鍵槽 Solid Output Shaft (No Keyway)	☐ 無鍵槽 No Keyway K: 有鍵槽 Keyway (142#~180#)	

FA

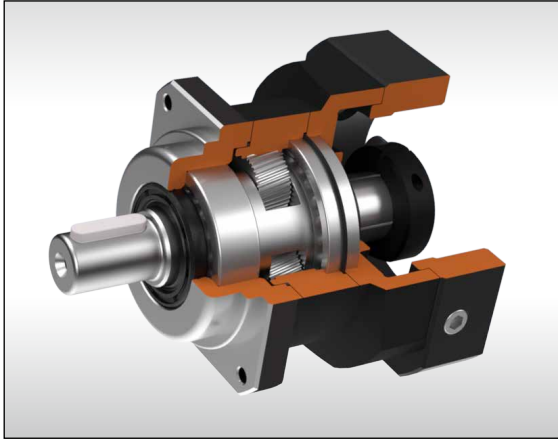


FA



Features of FA Series

FA 系列產品特點



螺旋齒輪設計及高精度齒輪加工

減速機構採用螺旋齒輪設計，齒形嚙合率為一般正齒輪的二倍以上，具有運轉平順、低噪音、高輸出扭矩和低背隙的特性。

材料採用高級鎳鉻鉬合金鋼 (SNM220)，切削加工後，經滲碳熱處理至硬度 57~60HRC，再進行齒面研磨，確保齒輪精度 DIN6 級以內。

Helical Gear Design

The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also features extremely smooth running, low noise, high torque output and low backlash.

High Precision Gear Machining

Manufactured from high quality Ni-Cr-Mo alloy steel (SNM220), precision machined and carburized to hardness 57-60 HRC. Precision teeth grinding sure gear accuracy reaches DIN6 class.



一體式行星臂架

行星臂架與輸出軸採一體式的結構設計，以確保提高扭轉剛性及精確度。

Integrated Planetary Arm Bracket

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy.



一體式齒輪箱本體

齒輪箱和內環齒輪採一體式的設計。提高結構剛性及輸出扭矩。

One-piece Gear Box & Advanced surface Treatment

The gear box and internal ring gear are one-piece constructed to achieve high rigidity and high torque.



滿針滾針軸承設計

行星齒輪的傳動介面採用不含保持器之滿針滾針軸承，增加接觸面積以提高結構剛性及使用壽命。

Full Needle Roller Bearings Design

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.



筒夾式連結機構

輸入端與馬達的連結採用筒夾式的鎖緊機構，並經動平衡分析，以確保在高輸入轉速下結合介面的同心度和平衡度，及零背隙的動力傳遞。

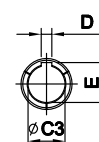
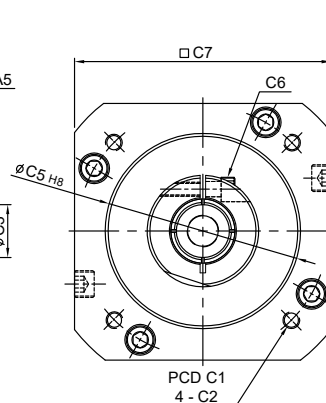
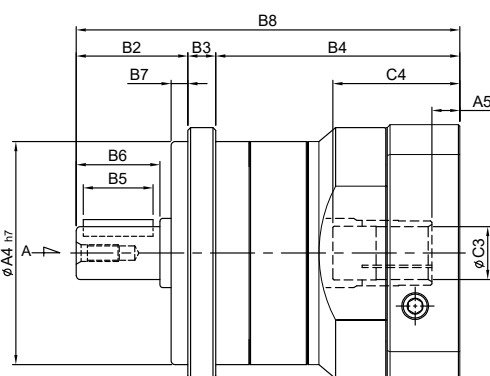
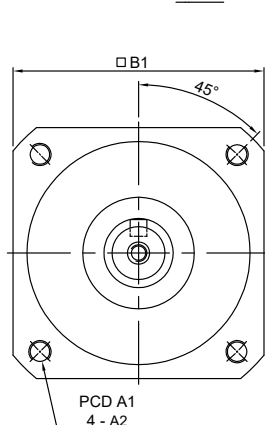
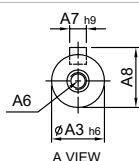
Collet Locking Mechanism

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.

MODEL : FA

單段 1-Stage

RATIO : 3, 4, 5, 7, 10



(142#~180#)

ØC3	D	E
Ø28	8	31.3
Ø32	10	35.3
Ø35	10	38.3
Ø38	10	41.3
Ø42	12	45.3
Ø48	14	51.8
Ø55	16	59.3

unit: mm

Model Code	50	70	80	90	100	120	142	180
A	A1	60	76	90	100	115	135	215
	A2	M5 x P0.8	Φ5.5	M6 x P1.0	M8 x P1.25	M8 x P1.25	M10 x P1.5	M14 x P2.0
	A3	12	16	19	19	24	32	55
	A4	50	60	70	80	90	110	160
	A5	4.5	6	10	10	8·22.5	10	11.5
	A6	M4 x P0.7 deep 11	M5 x P0.8 deep 14	M6 x P1.0 deep 15	M6 x P1.0 deep 15	M8 x P1.25 deep 20	M10 x P1.5 deep 23	M14 x P2.0 deep 32
	A7	4	5	6	6	8	10	16
	A8	13.5	18	21.5	21.5	27	35	59
B	B1	52	70	80	90	102	120	180
	B2	32	36	50	40	61	72	106
	B3	6	7	11	10	13	10	16
	B4	58.5	72/80	76.5	87.5	89.5/104	123/133	201.5/204.5
	B5	15	20	25	25	30	40	70
	B6	20	28	30	30	40	50	82
	B7	4.5	7	5	6	5	10	20
	B8	96.5	115·123	137.5	137.5	163.5·178	205·215	323.5·326.5
C	C1	45·46·48.5·63·70	70·75·85	70·90·100·115	90·100·115·145	90·100·115·145	115·145·165	130·145·165·175·215
	C2	M3·M4·M5	M5·M6	M5·M6	M6·M8	M6·M8	M6·M8·M10	M8·M10·M12
	C3	8·10·11·14	11·14·16·19	16·19	16·19	19·22·24	22·24·28·32	28·32·35·38
	C4	32	33.5·41.5	45.5	45.5	51·65.5	67·77	84.5
	C5	30·40·50	50·60·70	50·70·80·95	70·80·95·110	70·80·95·110	95·110·130	110·130·180
	C6	M4 x P0.7	M5 x P0.8	M5 x P0.8	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46·55·60	64·70·80	80·92·110	92·110·130	92·110·130	122·130·150	146·150·190

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	80	90	100	120	142	180
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	19	54	112	112	165	286	550	1,060
			4	16	48	110	110	146	255	490	940
			5	16	45	108	108	160	264	510	1,050
			7	15	41	105	105	149	245	470	970
			10	14	40	100	100	141	234	450	930
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 10	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque							
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque							
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 10	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 10	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
背隙 Backlash		arcmin	3 ~ 10	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 10	3	5	12	12	14	23	60	140
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 10	350	800	1,200	1,200	3,200	5,220	8,800	14,800
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 10	180	400	600	600	1,600	2,600	4,400	7,400
使用壽命 Service Life	L_H	hr	3 ~ 10	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)							
效率 Efficiency	η	%	3 ~ 10	≥ 97%							
使用溫度 Operating Temperature		°C	3 ~ 10	- 25° C ~ + 90° C							
潤滑 Lubrication			3 ~ 10	全合成潤滑油脂 Synthetic Grease							
防護等級 Protection Class			3 ~ 10	IP65							
安裝方向 Mounting Position			3 ~ 10	任意方向 Any							
噪音值 Noise Level		dB	3 ~ 10	≤ 58	≤ 58	≤ 60	≤ 60	≤ 65	≤ 67	≤ 69	≤ 70
重量 Weight ±2%		Kg	3 ~ 10	0.64	1	1.6	1.96	3.76	7.43	16.7	33

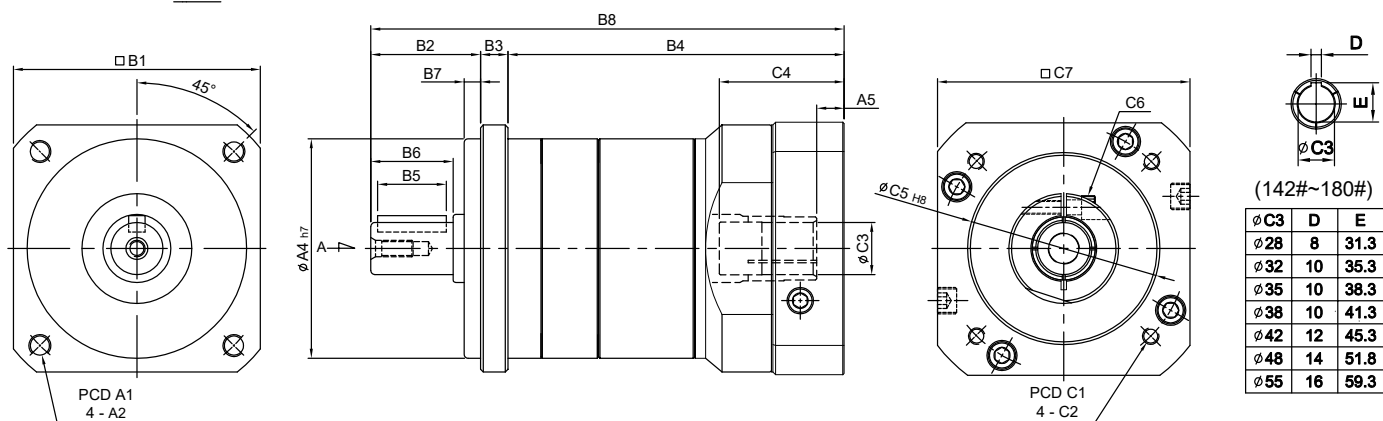
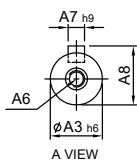
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	70	80	90	100	120	142	180
3	0.03	0.16	0.48	0.48	0.60	3.21	9.2	29.0
4	0.03	0.14	0.38	0.38	0.45	2.64	7.5	23.7
5	0.03	0.13	0.38	0.38	0.45	2.64	7.4	23.3
7	0.03	0.13	0.38	0.38	0.45	2.62	7.1	22.5
10	0.03	0.13	0.35	0.35	0.41	2.51	7.0	22.5

MODEL : FA

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 70, 100



unit: mm

Model Code	50	70	80	90	100	120	142	180
A1	60	76	90	100	115	135	165	215
A2	M5 x P0.8	Φ5.5	M6 x P1.0	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0
A3	12	16	19	19	24	32	40	55
A4	50	60	70	80	90	110	130	160
A5	4.5	6	10	10	8・22.5	10	10	11.5
A6	M4 x P0.7 deep 11	M5 x P0.8 deep 14	M6 x P1.0 deep 15	M6 x P1.0 deep 15	M8 x P1.25 deep 20	M10 x P1.5 deep 23	M10 x P1.5 deep 23	M14 x P2.0 deep 32
A7	4	5	6	6	8	10	12	16
A8	13.5	18	21.5	21.5	27	35	43	59
B1	52	70	80	90	102	120	142	180
B2	32	36	50	40	61	72	87	106
B3	6	7	11	10	13	10	15	16
B4	84.5	105.8/113.8	99.5/111.5	122.5	133/147.5	179/189	158.5	282.5/285.5
B5	15	20	25	25	30	40	65	70
B6	20	28	30	30	40	50	74	82
B7	4.5	7	5	6	5	10	10	20
B8	122.5	148.8・156.8	160.5・172.5	172.5	207・221.5	261・271	260.5	404.5・407.5
C1	45・46・48.5・63・70	70・75・85	70・90・100・115	90・100・115・145	90・100・115・145	115・145・165	130・145・165・175・215	149・200・215・265・300
C2	M3・M4・M5	M5・M6	M5・M6	M6・M8	M6・M8	M6・M8・M10	M8・M10・M12	M8・M12・M16 M12・M16
C3	8・10・11・14	11・14・16・19	16・19	16・19	19・22・24	22・24・28・32	28・32・35・38	35・38・42・48・55
C4	32	33.5・41.5	33.5・45.5	45.5	51・65.5	67・77	84.5	114.5・117.5
C5	30・40・50	50・60・70	50・70・80・95	70・80・95・110	70・80・95・110	95・110・130	110・130・180	114.3・180・230・250
C6	M4 x P0.7	M5 x P0.8	M5 x P0.8	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	46・55・60	64・70・80	80・92・110	92・110・130	92・110・130	122・130・150	146・150・190	182・200・250・265

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	80	90	100	120	142	180
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	19	54	112	112	165	286	550	1,060
			20	16	48	110	110	146	255	490	940
			25	16	45	108	108	160	264	510	1,050
			30	19	41	112	112	165	286	550	1,060
			35	15	41	105	105	149	245	470	970
			40	16	39	110	110	146	255	490	940
			50	16	45	108	108	160	264	510	1,050
			70	15	41	105	105	149	245	470	970
			100	14	40	100	100	141	234	450	930
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque							
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque							
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	5,000	5,000	5,000	5,000	5,000	5,000	5,000	4,000
背隙 Backlash		arcmin	15 ~ 100	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	3	5	12	12	14	23	60	140
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	350	800	1,200	1,200	3,200	5,220	8,800	14,800
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	180	400	600	600	1,600	2,600	4,400	7,400
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)							
效率 Efficiency	η	%	15 ~ 100	≥ 94%							
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C							
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease							
防護等級 Protection Class			15 ~ 100	IP65							
安裝方向 Mounting Position			15 ~ 100	任意方向 Any							
噪音值 Noise Level		dB	15 ~ 100	≤ 60	≤ 60	≤ 62	≤ 62	≤ 67	≤ 69	≤ 70	≤ 72
重量 Weight ±2%		Kg	15 ~ 100	0.96	2.1	2.8	3.06	5.92	10.3	20.5	41

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	70	80	90	100	120	142	180
15	0.03	0.13	0.41	0.41	0.45	2.64	7.3	22.8
20	0.03	0.13	0.38	0.38	0.45	2.64	7.3	22.8
25	0.03	0.13	0.38	0.38	0.45	2.64	7.1	22.8
30	0.03	0.13	0.38	0.38	0.45	2.64	7.3	22.6
35	0.03	0.13	0.38	0.38	0.45	2.64	6.7	22.6
40	0.03	0.13	0.38	0.38	0.45	2.64	7.3	22.6
50	0.03	0.13	0.38	0.38	0.45	2.51	7.1	22.6
70	0.03	0.13	0.38	0.38	0.45	2.51	6.7	21.9
100	0.03	0.13	0.38	0.38	0.45	2.51	6.7	21.9



Indication of Model Numbers

機種型號表示

FB	90	10			MOTOR
減速機型 Type	型號 Model	速比 Ratio	出力軸鍵槽 Output Shaft	入力軸鍵槽 Input Shaft	馬達型號 Motor Type
FB	50	單段 1-Stage	☐ 標準品，有鍵槽 Standard (Keyway)	☐ 無鍵槽 No Keyway	
FE	70	3, 4, 5, 7, 10		K: 有鍵槽 Keyway (145#~220#)	
	90	雙段 2-Stage	N: 實心軸，無鍵槽 Solid Output Shaft (No Keyway)		
	120	15, 20, 25, 30, 35,			
	145	40, 50, 70, 100			
	180				
	220				

FB

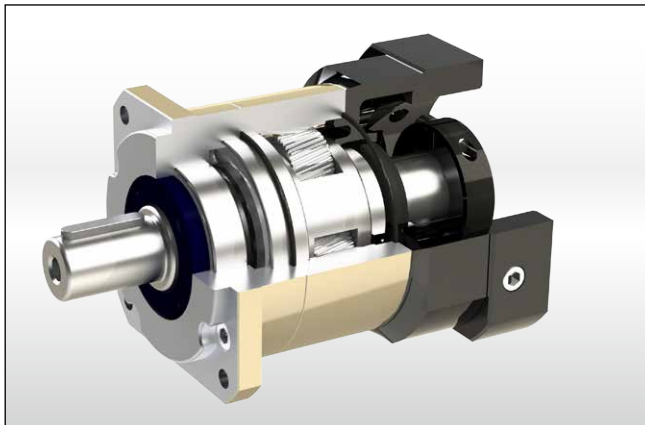


FE



Features of FB / FE Series

FB / FE 系列產品特點



螺旋齒輪設計及高精度齒輪加工

減速機構採用螺旋齒輪設計，齒形嚙合率為一般正齒輪的二倍以上，具有運轉平順、低噪音、高輸出扭矩和低背隙的特性。材料採用高級鎳鉻鉬合金鋼 (SNM220)，切削加工後，經滲碳熱處理至硬度 57~60HRC，再進行齒面研磨，確保齒輪精度 DIN6 級以內。

Helical Gear Design

The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also features extremely smooth running, low noise, high torque output and low backlash.

High Precision Gear Machining

Manufactured from high quality Ni-Cr-Mo alloy steel (SNM220), precision achined and carburized to hardness 57-60 HRC. Precision teeth grinding sure gear accuracy reaches DIN6 class.



滿針滾針軸承設計

行星齒輪的傳動介面採用不含保持器之滿針滾針軸承，增加接觸面積以提高結構剛性及使用壽命。

Full Needle Roller Bearings Design

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.



一體式行星臂架及雙軸承加大跨距設計

行星臂架與輸出軸採一體式的結構設計，以確保提高扭轉剛性及精確度。並採用滾珠軸承大跨距配置設計，增加輸出軸之徑向負載。

Integrated Planetary Arm Bracket

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy. The entire structure is integrated machined for controlling accuracy in the specified tolerance.



一體式齒輪箱本體

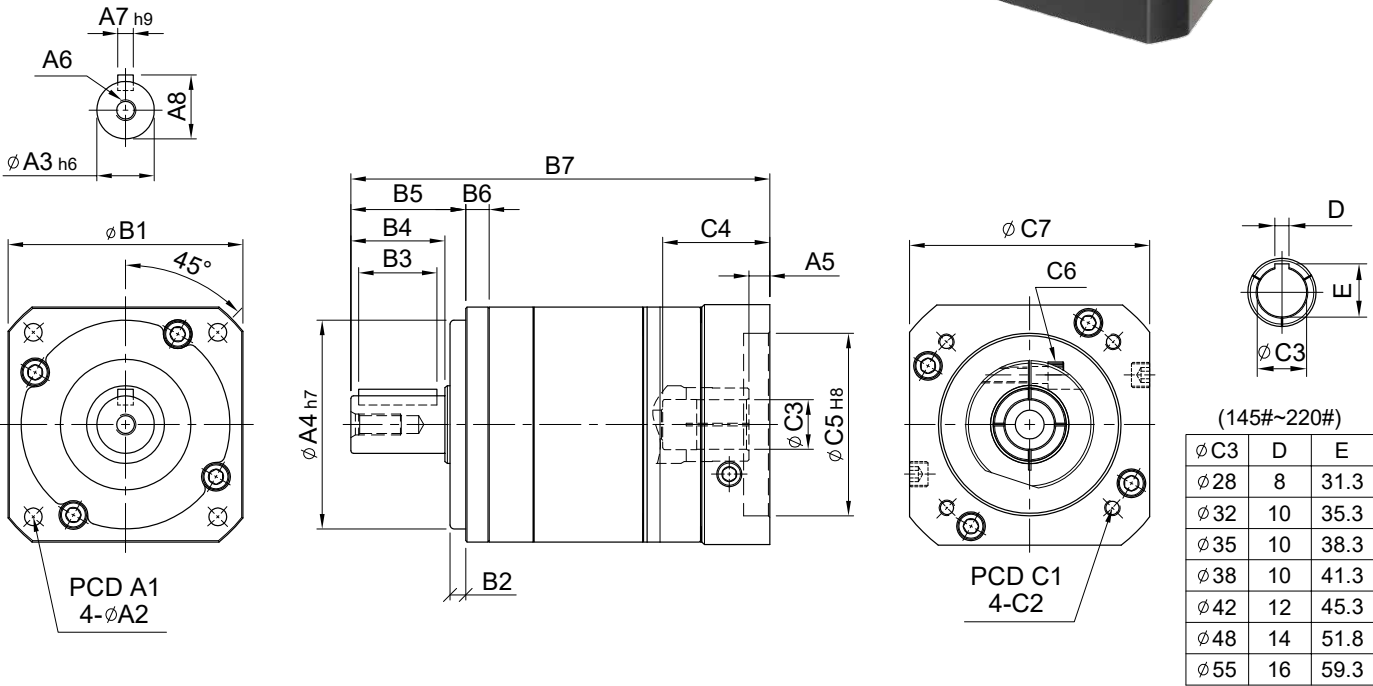
齒輪箱和內環齒輪採一體式的設計，經調質後加工，輸出扭矩大，齒輪精度達 DIN6 級，精密度高。

One-piece Gearbox Housing

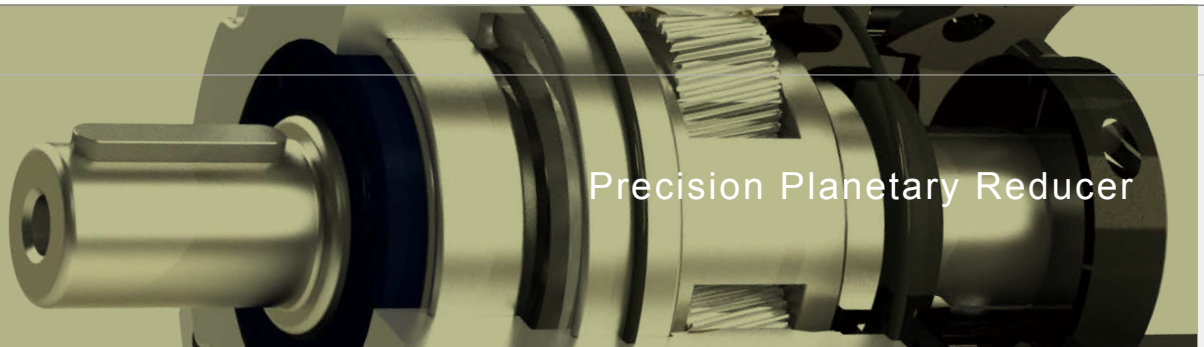
The gearbox and internal ring gear are one-piece constructed. High gear accuracy meets DIN6 class.

MODEL : FB

單段 1-Stage
RATIO : 3, 4, 5, 7, 10



unit: mm								
A	Model Code	50	70	90	120	145	180	220
	A1	50	70	100	130	165	215	250
	A2	4.5	6	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	5	6	9・23.5	10・20	10	13・15	13.5・16.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5	6	10	12	16	20
B	A8	15	18	24.5	35	43	59	79.5
	B1	50	70	90	120	145	180	220
	B2	4	5	6	8	10	20	20
	B3	15	20	30	40	65	70	90
	B4	20	28	36	50	74	82	104
	B5	25	34	44	60	87	106	129
	B6	6	8	9	12	15	16	24
C	B7	100.5	132.5・140.5	170.5・185	227.5	284	325・327	377・380
	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・215	200・215・265	200・265・300
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12	M10・M12	M12・M16
	C3	8・9・11	11・14	16・19・22・24	22・24・28・32	28・32・35・38	35・38・42・48	42・48・55
	C4	26	33.5・41.5	51・65.5	63・73	81.5	115・117	118・121
	C5	30・40・50	40・50・60	70・80・95・110	95・110・130	110・130・180	114.3・180・230	114.3・230・250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190	182・200・250	222・250・265



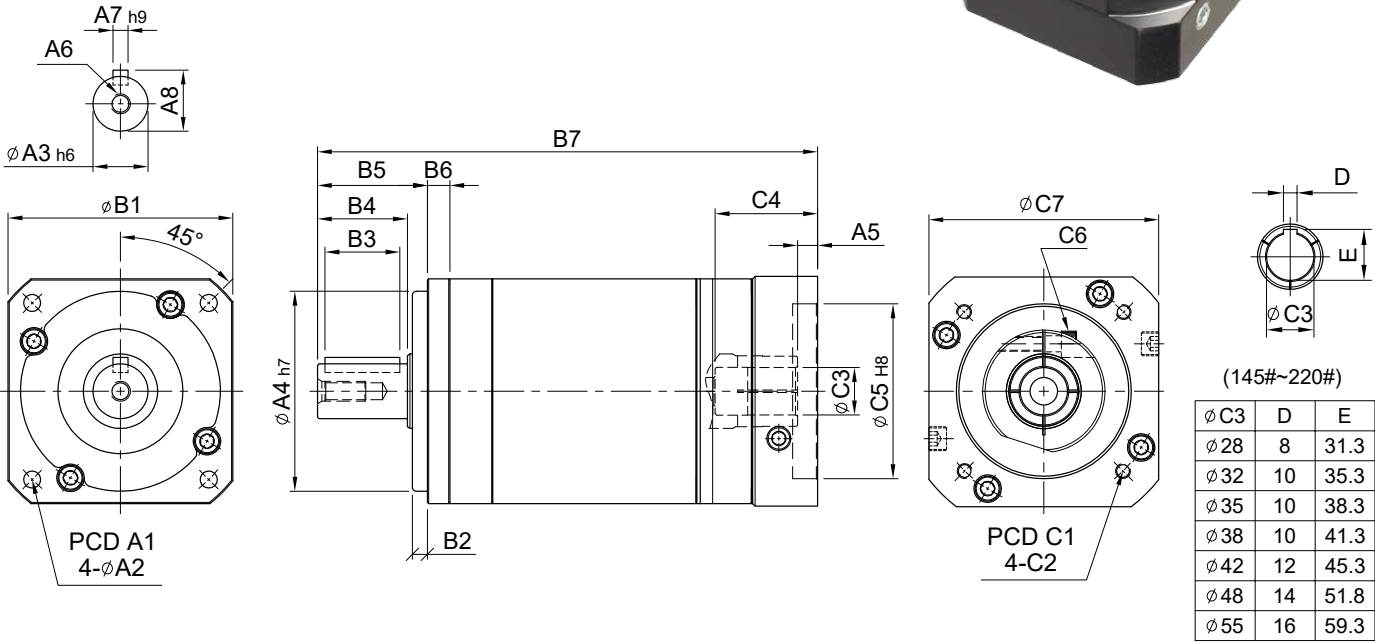
規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	90	120	145	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	17	50	125	268	482	940	1,420
			4	15	45	111	238	426	860	1,300
			5	14	42	104	223	401	835	1,270
			7	13	39	98	208	373	790	1,180
			10	12	37	92	198	356	760	1,140
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 10	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 10	3,000	3,000	3,000	3,000	3,000	2,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 10	5,000	5,000	5,000	5,000	5,000	3,000	3,000
背隙 Backlash		arcmin	3 ~ 10	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 10	2.3	5	15	45	69	140	220
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 10	750	1,180	3,000	6,500	9,100	11,150	35,000
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 10	325	590	1,500	3,250	4,550	5,575	17,500
使用壽命 Service Life	L_H	hr	3 ~ 10	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	3 ~ 10	≥ 97%						
使用溫度 Operating Temperature		°C	3 ~ 10	- 25° C ~ + 90° C						
潤滑 Lubrication			3 ~ 10	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			3 ~ 10	IP65						
安裝方向 Mounting Position			3 ~ 10	任意方向 Any						
噪音值 Noise Level		dB	3 ~ 10	≤ 62	≤ 62	≤ 65	≤ 68	≤ 70	≤ 70	≤ 70
重量 Weight ±3%		Kg	3 ~ 10	0.63	1.57	3.22	8	16	33	54

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	70	90	120	145	180	220
3	0.04	0.14	0.61	3.25	8.75	24.63	50.67
4	0.04	0.13	0.48	2.74	7.16	20.12	46.21
5	0.04	0.11	0.47	2.74	6.84	19.80	45.28
7	0.04	0.11	0.44	2.58	6.78	19.21	43.32
10	0.04	0.11	0.44	2.57	6.68	19.13	42.98

MODEL : FB

雙段 2-Stage
RATIO : 15, 20, 25, 30, 35, 40, 50, 70, 100



unit: mm								
A	Model Code	50	70	90	120	145	180	220
	A1	50	70	100	130	165	215	250
	A2	4.5	6	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	5	6	9・23.5	10・20	10	13・15	13.5・16.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5	6	10	12	16	20
B	A8	15	18	24.5	35	43	59	79.5
	B1	50	70	90	120	145	180	220
	B2	4	5	6	8	10	20	20
	B3	15	20	30	40	65	70	90
	B4	20	28	36	50	74	82	104
	B5	25	34	44	60	87	106	129
	B6	6	8	9	12	15	16	24
C	B7	126.7	166.5	206.5・221	281.5・291.5	340.5	394.5・396.5	464・467
	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・215	200・215・265	200・265・300
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12	M10・M12	M12・M16
	C3	8・9・11	11・14	16・19・22・24	22・24・28・32	28・32・35・38	35・38・42・48	42・48・55
	C4	26	33.5	51・65.5	63・73	81.5	115・117	118・121
	C5	30・40・50	40・50・60	70・80・95・110	95・110・130	110・130・180	114.3・180・230	114.3・230・250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190	182・200・250	222・250・265

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	90	120	145	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	17	50	125	268	482	940	1,420
			20	15	45	111	238	426	860	1,300
			25	14	42	104	223	401	835	1,270
			30	17	50	125	268	482	940	1,420
			35	13	39	98	208	373	790	1,180
			40	15	45	111	238	427	860	1,300
			50	14	42	104	223	402	835	1,270
			70	13	40	98	208	373	790	1,180
			100	12	37	92	198	357	760	1,100
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	2,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	5,000	5,000	5,000	5,000	5,000	3,000	3,000
背隙 Backlash		arcmin	15 ~ 100	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	2.3	5	15	45	69	140	220
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	750	1,180	3,000	6,500	9,100	11,150	35,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	325	590	1,500	3,250	4,550	5,575	17,500
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	15 ~ 100	≥ 94%						
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C						
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			15 ~ 100	IP65						
安裝方向 Mounting Position			15 ~ 100	任意方向 Any						
噪音值 Noise Level		dB	15 ~ 100	≤ 65	≤ 65	≤ 68	≤ 70	≤ 72	≤ 72	≤ 72
重量 Weight ±3%		Kg	15 ~ 100	0.9	2.24	4.59	11.22	22.5	46.6	75

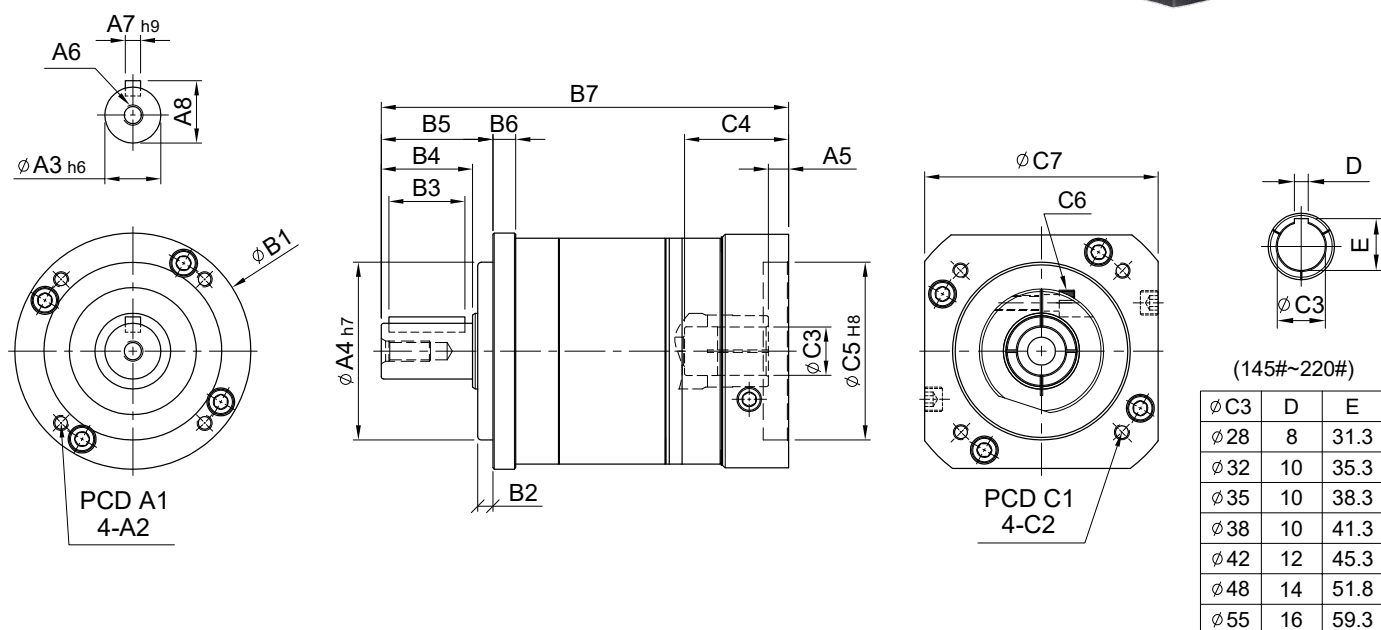
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	70	90	120	145	180	220
15	0.04	0.14	0.61	3.25	8.75	24.63	50.67
20	0.04	0.13	0.48	2.74	7.16	20.12	46.21
25	0.04	0.11	0.47	2.74	6.84	19.80	45.28
30	0.04	0.14	0.61	3.25	8.75	24.63	50.67
35	0.04	0.11	0.44	2.58	6.78	19.21	43.32
40	0.04	0.11	0.48	2.74	7.16	20.12	46.21
50	0.04	0.11	0.47	2.74	6.84	19.80	45.28
70	0.04	0.11	0.44	2.58	6.78	19.21	43.32
100	0.04	0.11	0.44	2.57	6.68	19.13	42.98

MODEL : FE

單段 1-Stage

RATIO : 3, 4, 5, 7, 10



unit: mm

	Model Code	50	70	90	120	145	180	220
A	A1	42	60	80	105	130	184	218
	A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
	A3	13	16	22	32	40	55	75
	A4	35	50	70	90	110	160	180
	A5	5	6	9・23.5	10・20	10	13・15	13.5・16.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
B	B1	Ø50	Ø70	Ø93	Ø122	Ø148	Ø205	Ø242
	B2	4	5	6	8	10	20	20
	B3	15	20	30	40	65	70	90
	B4	20	28	36	50	74	82	104
	B5	25	34	44	60	87	106	129
	B6	6	8	9	12	15	21.5	30
	B7	100.5	132.5・140.5	170.5・185	227.5・237.5	284	325・327	377・380
C	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・215	200・215・265	200・265・300
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12	M10・M12	M12・16
	C3	8・9・11	11・14	16・19・22・24	22・24・28・32	28・32・35・38	35・38・42・48	42・48・55
	C4	26	33.5・41.5	51・65.5	63・73	77・81.5	115・117	118・121
	C5	30・40・50	40・50・60	70・80・95・110	95・110・130	110・130・180	114.3・180・230	114.3・230・250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190	182・200・250	222・250・265

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	90	120	145	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	17	50	125	268	482	940	1,420
			4	15	45	111	238	426	860	1,300
			5	14	42	104	223	401	835	1,270
			7	13	39	98	208	373	790	1,180
			10	12	37	92	198	356	760	1,140
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 10	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 10	3,000	3,000	3,000	3,000	3,000	2,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 10	5,000	5,000	5,000	5,000	5,000	3,000	3,000
背隙 Backlash		arcmin	3 ~ 10	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 10	2.3	5	15	45	69	140	220
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 10	750	1,180	3,000	6,500	9,100	11,150	35,000
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 10	325	590	1,500	3,250	4,550	5,575	17,500
使用壽命 Service Life	L_H	hr	3 ~ 10	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	3 ~ 10	≥ 97%						
使用溫度 Operating Temperature		°C	3 ~ 10	- 25° C ~ + 90° C						
潤滑 Lubrication			3 ~ 10	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			3 ~ 10	IP65						
安裝方向 Mounting Position			3 ~ 10	任意方向 Any						
噪音值 Noise Level		dB	3 ~ 10	≤ 62	≤ 62	≤ 65	≤ 68	≤ 70	≤ 70	≤ 70
重量 Weight ±3%		Kg	3 ~ 10	0.63	1.57	3.22	8	16	33	54

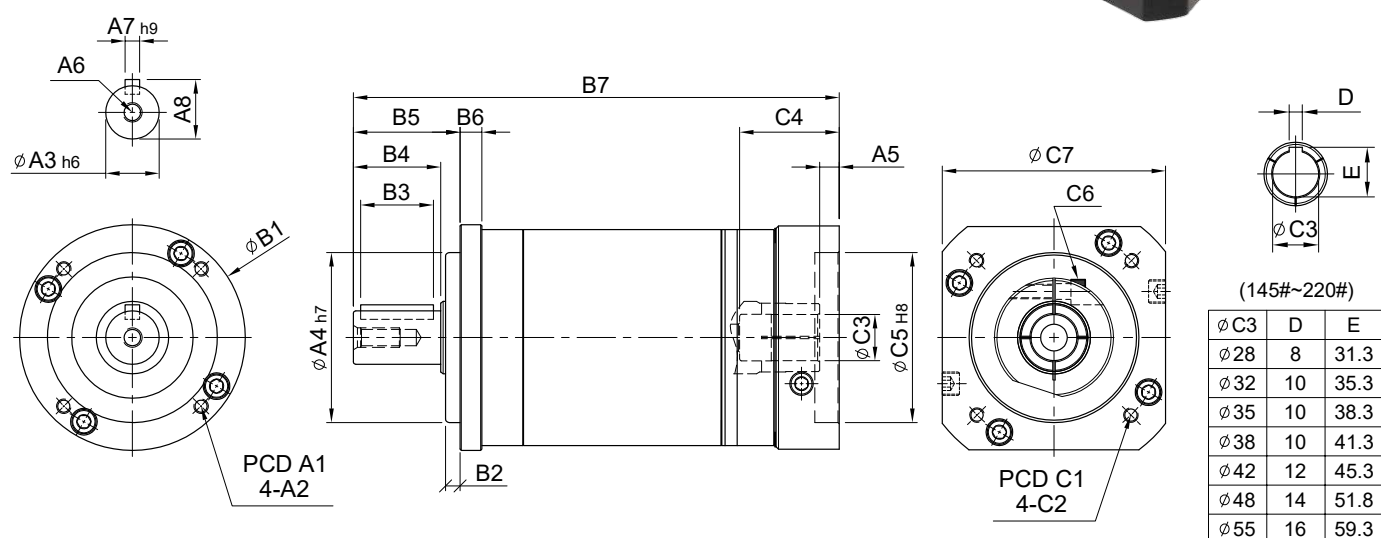
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	70	90	120	145	180	220
3	0.04	0.14	0.61	3.25	8.75	24.63	50.67
4	0.04	0.13	0.48	2.74	7.16	20.12	46.21
5	0.04	0.11	0.47	2.74	6.84	19.80	45.28
7	0.04	0.11	0.44	2.58	6.78	19.21	43.32
10	0.04	0.11	0.44	2.57	6.68	19.13	42.98

MODEL : FE

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 70, 100



unit: mm

	Model Code	50	70	90	120	145	180	220
A	A1	42	60	80	105	130	184	218
	A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
	A3	13	16	22	32	40	55	75
	A4	35	50	70	90	110	160	180
	A5	5	6	9 · 23.5	10 · 20	10	13 · 15	13.5 · 16.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
B	B1	Ø50	Ø70	Ø93	Ø122	Ø148	Ø205	Ø242
	B2	4	5	6	8	10	20	20
	B3	15	20	30	40	65	70	90
	B4	20	28	36	50	74	82	104
	B5	25	34	44	60	87	106	129
	B6	6	8	9	12	15	21.5	30
	B7	126.7	166.5	206.5 · 221	281.5 · 291.5	340.5	394.5 · 396.5	464 · 467
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 215	200 · 215 · 265	200 · 265 · 300
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12	M12 · M16
	C3	8 · 9 · 11	11 · 14	16 · 19 · 22 · 24	22 · 24 · 28 · 32	28 · 32 · 35 · 38	35 · 38 · 42 · 48	42 · 48 · 55
	C4	26	33.5	51 · 65.5	63 · 73	77 · 81.5	115 · 117	118 · 121
	C5	30 · 40 · 50	40 · 50 · 60	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	90	120	145	180	220
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	17	50	125	268	482	940	1,420
			20	15	45	111	238	426	860	1,300
			25	14	42	104	223	401	835	1,270
			30	17	50	125	268	482	940	1,420
			35	13	39	98	208	373	790	1,180
			40	15	45	111	238	427	860	1,300
			50	14	42	104	223	402	835	1,270
			70	13	40	98	208	373	790	1,180
			100	12	37	92	198	357	760	1,100
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque						
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque						
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	2,000	2,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	5,000	5,000	5,000	5,000	5,000	3,000	3,000
背隙 Backlash		arcmin	15 ~ 100	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	2.3	5	15	45	69	140	220
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	750	1,180	3,000	6,500	9,100	11,150	35,000
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	325	590	1,500	3,250	4,550	5,575	17,500
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
效率 Efficiency	η	%	15 ~ 100	≥ 94%						
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C						
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease						
防護等級 Protection Class			15 ~ 100	IP65						
安裝方向 Mounting Position			15 ~ 100	任意方向 Any						
噪音值 Noise Level		dB	15 ~ 100	≤ 65	≤ 65	≤ 68	≤ 70	≤ 72	≤ 72	≤ 72
重量 Weight ±3%		Kg	15 ~ 100	0.9	2.24	4.59	11.22	22.5	46.4	75

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	70	90	120	145	180	220
15	0.04	0.14	0.61	3.25	8.75	24.63	50.67
20	0.04	0.13	0.48	2.74	7.16	20.12	46.21
25	0.04	0.11	0.47	2.74	6.84	19.80	45.28
30	0.04	0.14	0.61	3.25	8.75	24.63	50.67
35	0.04	0.11	0.44	2.58	6.78	19.21	43.32
40	0.04	0.11	0.48	2.74	7.16	20.12	46.21
50	0.04	0.11	0.47	2.74	6.84	19.80	45.28
70	0.04	0.11	0.44	2.58	6.78	19.21	43.32
100	0.04	0.11	0.44	2.57	6.68	19.13	42.98

Indication of Model Numbers

機種型號表示

FC	90	10			MOTOR
減速機型 Type	型號 Model	速比 Ratio	出力軸鍵槽 Output Shaft	入力軸鍵槽 Input Shaft	馬達型號 Motor Type
FC	50	單段 1-Stage	☐ 標準品，有鍵槽 Standard (Keyway)	☐ 無鍵槽 No Keyway	
FCL	70	3, 4, 5, 7, 10			
FN	90	雙段 2-Stage	N: 實心軸，無鍵槽 Solid Output Shaft (No Keyway)	K: 有鍵槽 Keyway (145#)	
FNL	120	15, 20, 25, 30, 35, 40, 50, 70, 100			
	145 (FC) 155 (FN)	單段 1-Stage (FCL) 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 40, 50			

FC



FCL



FN

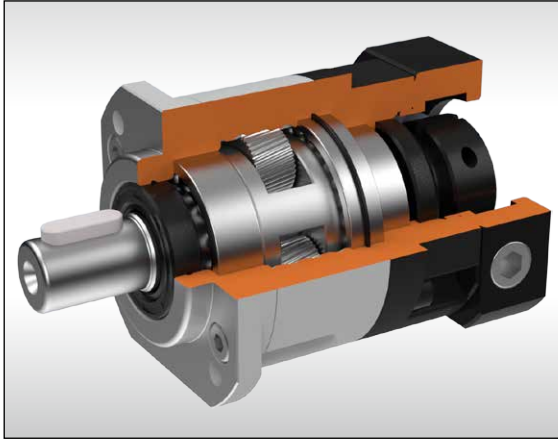


FNL



Features of FC / FN Series

FC / FN 系列產品特點



螺旋齒輪設計及高精度齒輪加工

減速機構採用螺旋齒輪設計，齒形嚙合率為一般正齒輪的二倍以上，具有運轉平順、高輸出扭矩和低背隙的特性。

材料採用高級鎳鉻鉬合金鋼 (SNCM220)，切削加工後，經滲碳熱處理至硬度 57~60HRC，再進行齒面研磨，確保齒輪精度 DIN6 級以內。

Helical Gear Design

The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also features extremely smooth running, high torque output and low backlash.

High Precision Gear Machining

Manufactured from high quality Ni-Cr-Mo alloy steel (SNCM220), precision achined and carburized to hardness 57-60 HRC. Precision teeth grinding sure gear accuracy reaches DIN6 class.

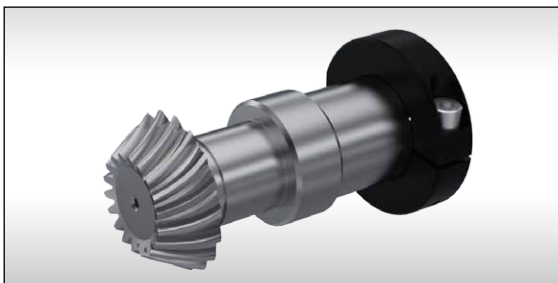


滿針滾針軸承設計

行星齒輪的傳動介面採用不含保持器之滿針滾針軸承，增加接觸面積以提高結構剛性及使用壽命。

Full Needle Roller Bearings Design

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.



螺旋傘齒輪

研磨等級螺旋傘齒輪傳動效率高，傳動比穩定，圓弧重疊係數大，承載能力高，傳動平穩平順，工作可靠，結構緊湊，耐磨損，壽命長。

Spiral Bevel Gear

Grinding spiral bevel gear is excellent in transmission efficiency, stability, durability, large arc overlapping factor, heavy loading, compact structure, wear-resisting and long service life.

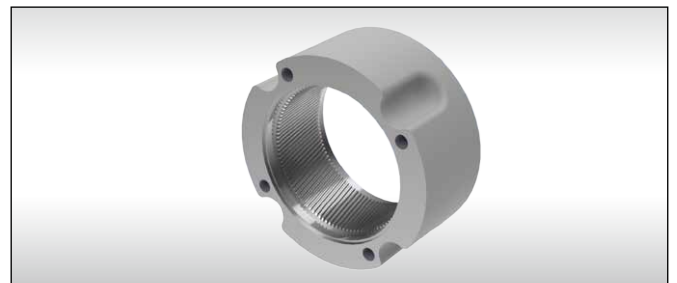


一體式行星臂架

行星臂架與輸出軸採一體式的結構設計，以確保提高扭轉剛性及精確度。

Integrated Planetary Arm Bracket

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy.



一體式螺旋內齒輪箱

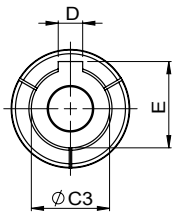
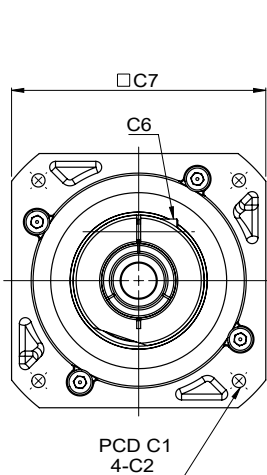
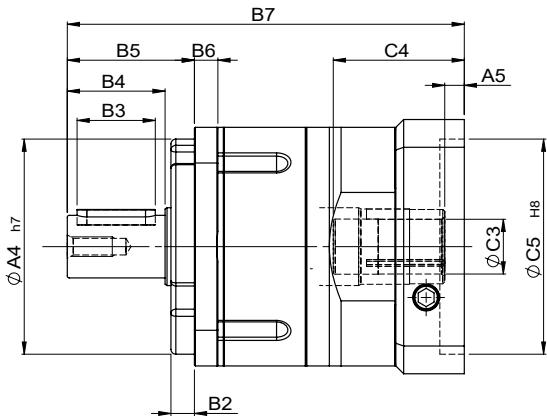
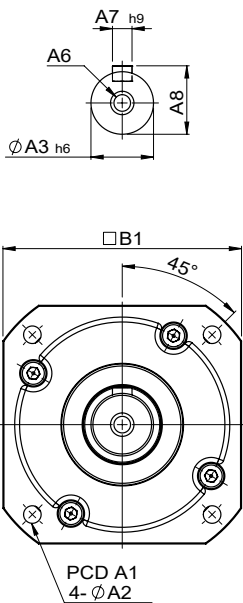
齒輪箱和內環齒輪採一體式的設計，減速機構採用螺旋齒輪設計，齒形嚙合率為一般正齒輪的二倍以上，具有運轉平順、低噪音、高輸出扭矩和低背隙的特性。

One-piece Helical Gear Box

The gear box and internal ring gear are one-piece constructed. The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also has features of extremely smooth running, low noise, high output torque and low backlash.

MODEL : FC

單段 1-Stage
RATIO : 3, 4, 5, 7, 10



(145#)

Ø C	D	E
Ø 28	8	31.3
Ø 32	10	35.3
Ø 35	10	38.3
Ø 38	10	41.3

unit: mm						
A	Model Code	50	70	90	120	145
	A1	50	70	100	130	165
	A2	4.5	5.5	6.8	9	11
	A3	13	16	22	32	40
	A4	35	50	80	110	130
	A5	4.5	6	9・23.5	10・20	11.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75
	A7	5	5	6	10	12
B	A8	15	18	24.5	35	43
	B1	51	69	90	122	145
	B2	5	7	10	12	12
	B3	15	20	30	40	65
	B4	20	28	36	50	74
	B5	26	36	48	65	92
	B6	5	7	9	12	14
C	B7	95	115・123	155.5・170	203・213	253.5
	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・165
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12
	C3	8・11	11・14・16・19	19・24	24・28・32	28・32・35・38
	C4	32	33.5・41.5	51・65.5	67・77	83
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	110・130・180
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	90	120	145
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	16	50	135	276	496
			4	14	45	120	245	432
			5	15	42	118	230	423
			7	12	40	114	215	393
			10	11	37	108	204	375
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 10	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque				
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque				
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 10	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 10	5,000	5,000	5,000	5,000	5,000
背隙 Backlash		arcmin	3 ~ 10	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 10	2.5	5	12	26	58
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 10	750	1,196	2,850	6,100	8,600
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 10	375	598	1,425	3,050	4,300
使用壽命 Service Life	L_H	hr	3 ~ 10	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
效率 Efficiency	η	%	3 ~ 10	≥ 97%				
使用溫度 Operating Temperature		°C	3 ~ 10	- 25° C ~ + 90° C				
潤滑 Lubrication			3 ~ 10	全合成潤滑油脂 Synthetic Grease				
防護等級 Protection Class			3 ~ 10	IP65				
安裝方向 Mounting Position			3 ~ 10	任意方向 Any				
噪音值 Noise Level		dB	3 ~ 10	≤ 58	≤ 60	≤ 62	≤ 65	≤ 66
重量 Weight ±3%		Kg	3 ~ 10	0.53	1.12	2.6	6.2	9.83

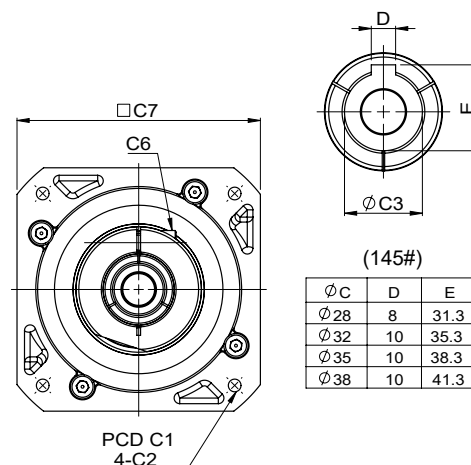
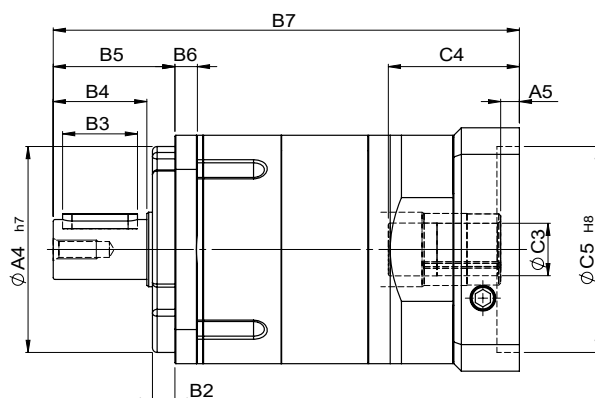
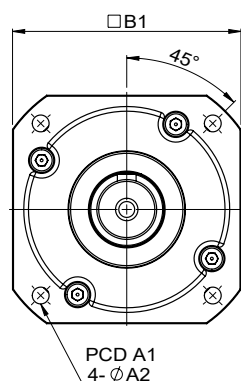
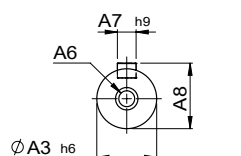
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	70	90	120	145
3	0.03	0.16	0.51	3.02	8.31
4	0.03	0.14	0.42	2.55	6.80
5	0.03	0.13	0.41	2.54	6.50
7	0.03	0.13	0.35	2.40	6.44
10	0.03	0.13	0.35	2.39	6.37

MODEL : FC

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 70, 100



(145#)

Ø C	D	E
Ø 28	8	31.3
Ø 32	10	35.3
Ø 35	10	38.3
Ø 38	10	41.3

unit: mm

	Model Code	50	70	90	120	145
A	A1	50	70	100	130	165
	A2	4.5	5.5	6.8	9	11
	A3	13	16	22	32	40
	A4	35	50	80	110	130
	A5	4.5	6	9 · 23.5	10 · 20	11.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75
	A7	5	5	6	10	12
	A8	15	18	24.5	35	43
B	B1	51	69	90	122	145
	B2	5	7	10	12	12
	B3	15	20	30	40	65
	B4	20	28	36	50	74
	B5	26	36	48	65	92
	B6	5	7	9	12	14
	B7	121	148.8 · 156.8	190.5 · 205	249 · 259	310
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 215
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
	C3	8 · 11	11 · 14 · 16 · 19	19 · 24	24 · 28 · 32	28 · 32 · 35 · 38
	C4	32	33.5 · 41.5	51 · 65.5	70 · 80	83
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	90	120	145
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	16	50	135	276	496
			20	14	45	120	245	432
			25	15	42	118	230	423
			30	16	50	135	275	496
			35	12	40	114	215	393
			40	14	45	120	245	432
			50	15	42	118	230	423
			70	12	40	114	215	393
			100	11	37	108	204	375
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque				
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque				
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	5,000	5,000	5,000	5,000	5,000
背隙 Backlash		arcmin	15 ~ 100	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	2.5	5	12	26	58
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	750	1,196	2,850	6,100	8,600
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	375	598	1,425	3,050	4,300
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
效率 Efficiency	η	%	15 ~ 100	$\geq 94\%$				
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C				
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease				
防護等級 Protection Class			15 ~ 100	IP65				
安裝方向 Mounting Position			15 ~ 100	任意方向 Any				
噪音值 Noise Level		dB	15 ~ 100	≤ 60	≤ 62	≤ 64	≤ 66	≤ 68
重量 Weight $\pm 3\%$		Kg	15 ~ 100	0.86	1.85	3.9	9.35	15.725

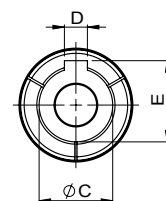
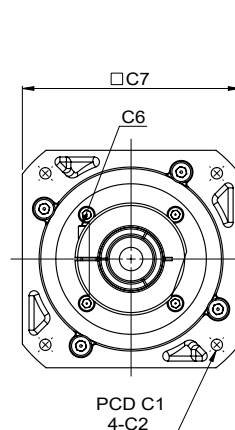
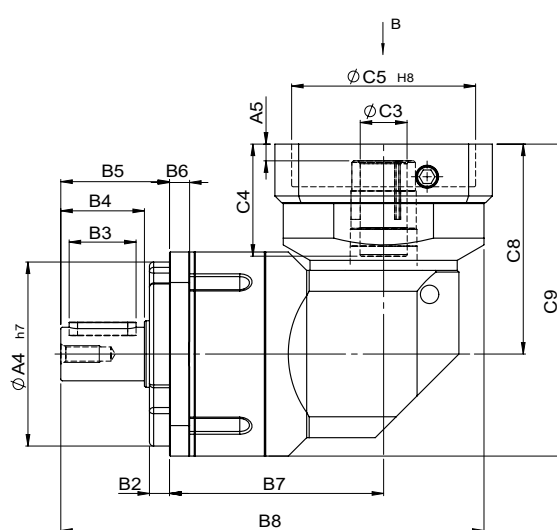
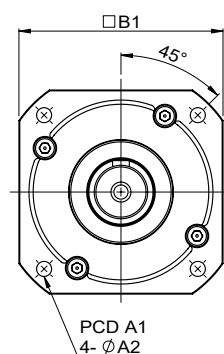
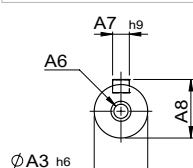
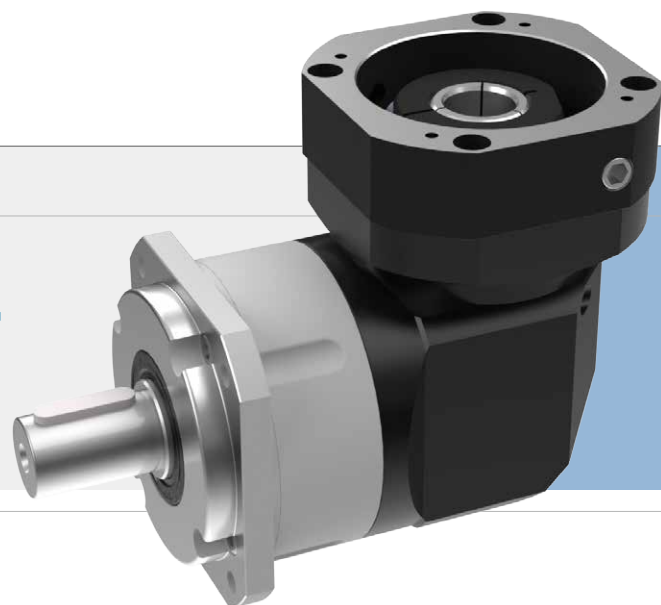
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	70	90	120	145
15	0.03	0.13	0.41	2.54	6.50
20	0.03	0.14	0.42	2.55	6.80
25	0.03	0.13	0.41	2.54	6.50
30	0.03	0.16	0.51	3.02	8.31
35	0.03	0.13	0.35	2.40	6.44
40	0.03	0.14	0.42	2.55	6.80
50	0.03	0.13	0.41	2.54	6.50
70	0.03	0.13	0.35	2.40	6.44
100	0.03	0.13	0.35	2.39	6.37

MODEL : FCL

單段 1-Stage

RATIO : 3, 4, 5, 6, 7, 8, 9, 10, 15,
20, 30, 40, 50



(145#)

ØC	D	E
Ø28	8	31.3
Ø32	10	35.3
Ø35	10	38.3

B VIEW

unit: mm

Model Code	50	70	90	120	145
A1	50	70	100	130	165
A2	4.5	5.5	6.8	9	11
A3	13	16	22	32	40
A4	35	50	80	110	130
A5	6	6	9	10	11.5
A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75
A7	5	5	6	10	12
A8	15	18	24.5	35	43
B1	51	69	90	122	145
B2	5	7	10	12	12
B3	15	20	30	40	65
B4	20	28	36	50	74
B5	26	36	48	65	92
B6	5	7	9	12	14
B7	63.5	77	95.5	128	151.5
B8	111.5	144	188.5	253	314.5
C1	46·60·63	70·75·90	90·100·115·145	115·145·165	145·165·215
C2	M3·M4·M5	M4·M5·M6	M5·M6·M8	M6·M8·M10	M8·M10·M12
C3	8·11	14·19	19·24	24·28·32	28·32·35
C4	26	42	53	67	81.5
C5	30·40·50	50·60·70	70·80·95·110	95·110·130	110·130·180
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
C7	46·55	64·70·80	92·110·130	122·130·150	146·150·190
C8	59	83.5	97	125.5	165
C9	84.5	118.5	142	186.5	237.5



規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	90	120	145
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	16	50	135	276	496
			4	14	45	120	245	432
			5	15	42	118	230	423
			6	16	50	135	276	496
			7	12	40	114	215	393
			8	14	45	120	245	432
			9	16	50	135	276	496
			10	15	42	118	230	423
			15	15	42	118	230	423
			20	15	42	118	230	423
			30	11	37	108	204	375
			40	11	37	108	204	375
			50	11	37	108	204	375
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 50	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque				
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 50	3 倍額定輸出力矩 3 Times of Rated Output Torque				
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 50	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 50	5,000	5,000	5,000	5,000	5,000
背隙 Backlash		arcmin	3 ~ 50	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 50	2.5	5	12	26	58
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 50	750	1,196	2,650	6,100	8,600
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 50	375	598	1,425	3,050	4,300
使用壽命 Service Life	L_H	hr	3 ~ 50	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
效率 Efficiency	η	%	3 ~ 50	≥ 94%				
使用溫度 Operating Temperature		°C	3 ~ 50	- 25° C ~ + 90° C				
潤滑 Lubrication			3 ~ 50	全合成潤滑油脂 Synthetic Grease				
防護等級 Protection Class			3 ~ 50	IP65				
安裝方向 Mounting Position			3 ~ 50	任意方向 Any				
噪音值 Noise Level		dB	3 ~ 50	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76
重量 Weight ±3%		Kg	3 ~ 50	0.87	1.86	3.7	9.45	15.3

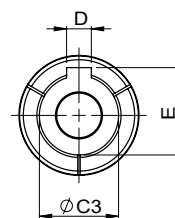
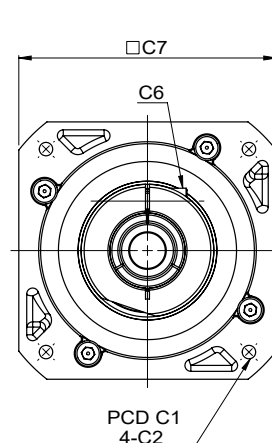
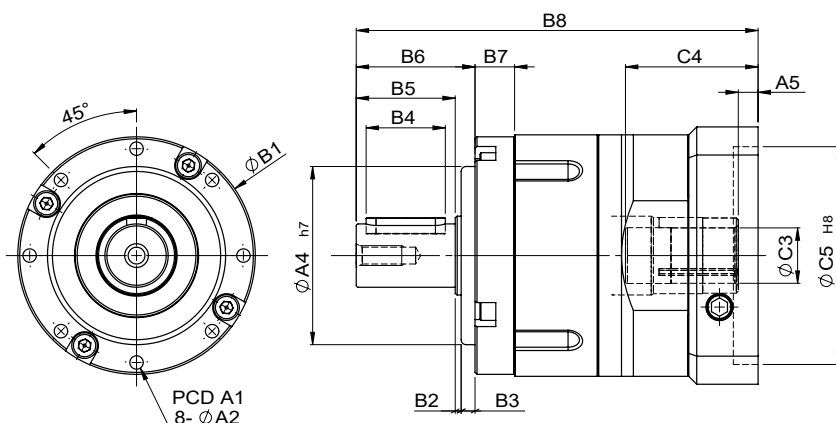
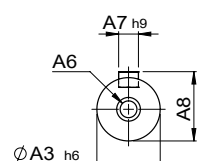
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	70	90	120	145
3 ~ 50	0.09	0.36	1.8	4.93	12.5

MODEL : FN

單段 1-Stage

RATIO : 3, 4, 5, 7, 10



(155#)

ΦC	D	E
Φ28	8	31.3
Φ32	10	35.3
Φ35	10	38.3
Φ38	10	41.3

PCD C1
4-C2

unit: mm

	Model Code	50	70	90	120	155
A	A1	44	62	80	108	140
	A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	A3	12	16	22	32	40
	A4	35	52	68	90	120
	A5	4.5	6	9 · 23.5	10 · 20	11.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75
	A7	4	5	6	10	12
	A8	13.5	18	24.5	35	43
B	B1	51	70	91	120	155
	B2	1.5	3	2	3	6
	B3	3	5	6	7	9.5
	B4	15	20	30	40	65
	B5	20	28	36	50	74
	B6	24.5	36	44	60	89.5
	B7	11	10	14.5	20	24
	B8	96.5	115 · 123	155.5 · 167	203 · 213	253.5
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 215
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
	C3	8 · 11	11 · 14 · 16 · 19	19 · 24	24 · 28 · 32	28 · 32 · 35 · 38
	C4	32	33.5 · 41.5	51 · 65.5	67 · 77	83
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	90	120	155
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	16	50	135	276	496
			4	14	45	120	245	432
			5	15	42	118	230	423
			7	12	40	114	215	393
			10	11	37	108	204	375
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 10	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque				
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 10	3 倍額定輸出力矩 3 Times of Rated Output Torque				
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3 ~ 10	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3 ~ 10	5,000	5,000	5,000	5,000	5,000
背隙 Backlash		arcmin	3 ~ 10	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 10	2.5	5	12	26	58
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 10	750	1,196	2,850	6,100	8,600
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 10	375	598	1,425	3,050	4,300
使用壽命 Service Life	L_H	hr	3 ~ 10	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
效率 Efficiency	η	%	3 ~ 10	≥ 97%				
使用溫度 Operating Temperature		°C	3 ~ 10	- 25° C ~ + 90° C				
潤滑 Lubrication			3 ~ 10	全合成潤滑油脂 Synthetic Grease				
防護等級 Protection Class			3 ~ 10	IP65				
安裝方向 Mounting Position			3 ~ 10	任意方向 Any				
噪音值 Noise Level		dB	3 ~ 10	≤ 58	≤ 60	≤ 62	≤ 65	≤ 66
重量 Weight ±3%		Kg	3 ~ 10	0.53	1.12	2.6	6.2	9.83

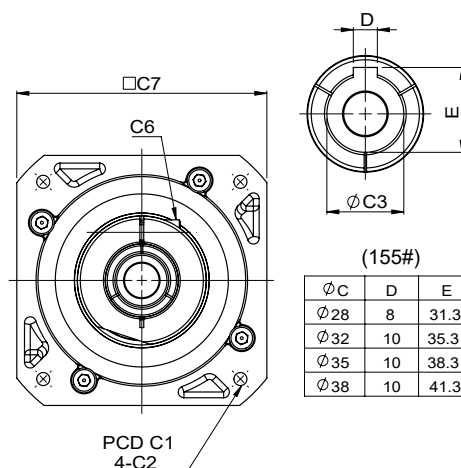
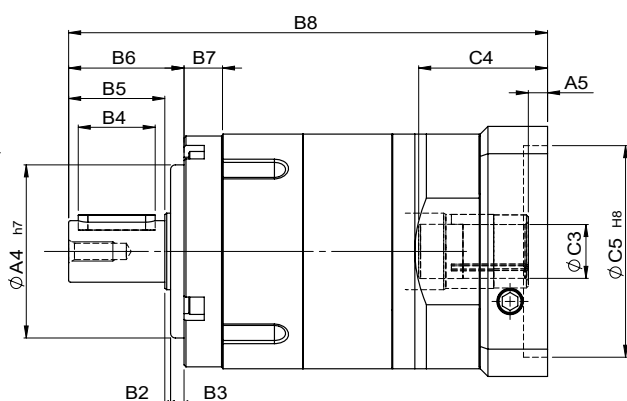
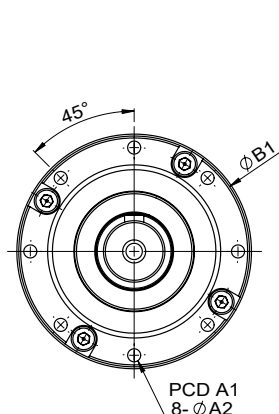
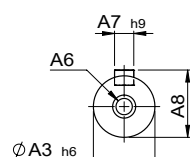
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	70	90	120	155
3	0.03	0.16	0.51	3.02	8.31
4	0.03	0.14	0.42	2.55	6.80
5	0.03	0.13	0.41	2.54	6.50
7	0.03	0.13	0.35	2.40	6.44
10	0.03	0.13	0.35	2.39	6.37

MODEL : FN

雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 70, 100



unit: mm

	Model Code	50	70	90	120	155
A	A1	44	62	80	108	140
	A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	A3	12	16	22	32	40
	A4	35	52	68	90	120
	A5	4.5	6	9・23.5	10・20	11.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75
	A7	4	5	6	10	12
	A8	13.5	18	24.5	35	43
B	B1	51	70	91	120	155
	B2	1.5	3	2	3	6
	B3	3	5	6	7	9.5
	B4	15	20	30	40	65
	B5	20	28	36	50	74
	B6	24.5	36	44	60	89.5
	B7	11	10	14.5	20	24
	B8	122.5	148.8・156.8	190.5・205	249・259	310
C	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・215
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12
	C3	8・11	11・14・16・19	19・24	24・28・32	28・32・35・38
	C4	32	33.5・41.5	51・65.5	67・77	83
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	110・130・180
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	90	120	155
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	16	50	135	276	496
			20	14	45	120	245	432
			25	15	42	118	230	423
			30	16	50	135	275	496
			35	12	40	114	215	393
			40	14	45	120	245	432
			50	15	42	118	230	423
			70	12	40	114	215	393
			100	11	37	108	204	375
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15 ~ 100	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque				
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15 ~ 100	3 倍額定輸出力矩 3 Times of Rated Output Torque				
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15 ~ 100	5,000	5,000	5,000	5,000	5,000
背隙 Backlash		arcmin	15 ~ 100	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
扭轉剛性 Torsional Rigidity		Nm/arcmin	15 ~ 100	2.5	5	12	26	58
容許徑向力 Max. Radial Force	F_{2rB}	N	15 ~ 100	750	1,196	2,850	6,100	8,600
容許軸向力 Max. Axial Force	F_{2aB}	N	15 ~ 100	375	598	1,425	3,050	4,300
使用壽命 Service Life	L_H	hr	15 ~ 100	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
效率 Efficiency	η	%	15 ~ 100	≥ 94%				
使用溫度 Operating Temperature		°C	15 ~ 100	- 25° C ~ + 90° C				
潤滑 Lubrication			15 ~ 100	全合成潤滑油脂 Synthetic Grease				
防護等級 Protection Class			15 ~ 100	IP65				
安裝方向 Mounting Position			15 ~ 100	任意方向 Any				
噪音值 Noise Level		dB	15 ~ 100	≤ 60	≤ 62	≤ 64	≤ 66	≤ 68
重量 Weight ±3%		Kg	15 ~ 100	0.86	1.85	3.9	9.35	15.725

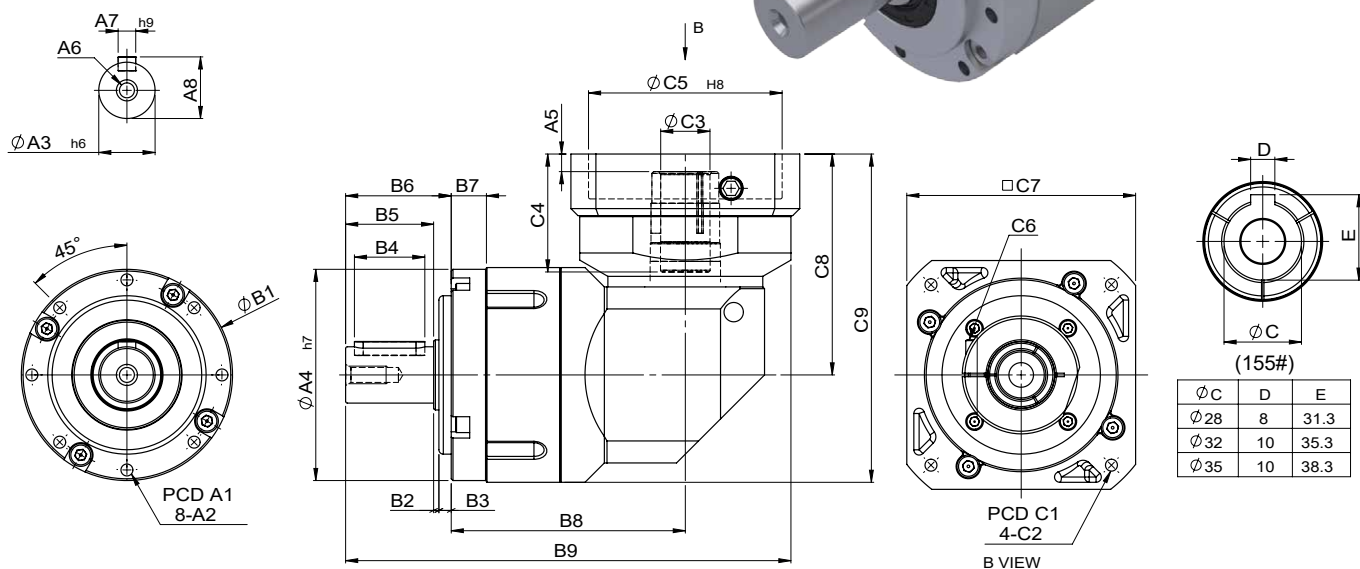
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	70	90	120	155
15	0.03	0.13	0.41	2.54	6.50
20	0.03	0.14	0.42	2.55	6.80
25	0.03	0.13	0.41	2.54	6.50
30	0.03	0.16	0.51	3.02	8.31
35	0.03	0.13	0.35	2.40	6.44
40	0.03	0.14	0.42	2.55	6.80
50	0.03	0.13	0.41	2.54	6.50
70	0.03	0.13	0.35	2.40	6.44
100	0.03	0.13	0.35	2.39	6.37

MODEL : FNL

單段 1-Stage

RATIO : 3, 4, 5, 6, 7, 8, 9, 10, 15,
20, 30, 40, 50



unit: mm

	Model Code	50	70	90	120	155
	A1	44	62	80	108	140
A	A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	A3	12	16	22	32	40
	A4	35	52	68	90	120
	A5	6	6	9	10	11.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75
	A7	4	5	6	10	12
	A8	13.5	18	24.5	35	43
	B	B1	51	70	91	120
B2		1.5	3	2	3	6
B3		3	5	6	7	9.5
B4		15	20	30	40	65
B5		20	28	36	50	74
B6		24.5	36	44	60	89.5
B7		11	10	14.5	20	24
B8		66.5	77	95.5	128	151.5
B9		113	144	188.5	253	314.5
C	C1	46・60・63	70・75・90	90・100・115・145	115・145・165	145・165・215
	C2	M3・M4・M5	M4・M5・M6	M5・M6・M8	M6・M8・M10	M8・M10・M12
	C3	8・11	14・19	19・24	24・28・32	28・32・35
	C4	26	42	53	67	81.5
	C5	30・40・50	50・60・70	70・80・95・110	95・110・130	110・130・180
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46・55	64・70・80	92・110・130	122・130・150	146・150・190
	C8	59	83.5	97	125.5	165
	C9	84.5	118.5	142	186.5	237.5

Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	50	70	90	120	155
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	16	50	135	276	496
			4	14	45	120	245	432
			5	15	42	118	230	423
			6	16	50	135	276	496
			7	12	40	114	215	393
			8	14	45	120	245	432
			9	16	50	135	276	496
			10	15	42	118	230	423
			15	15	42	118	230	423
			20	15	42	118	230	423
			30	11	37	108	204	375
			40	11	37	108	204	375
			50	11	37	108	204	375
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3 ~ 50	1.8 倍額定輸出扭矩 1.8 Times of Rated Output Torque				
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3 ~ 50	3 倍額定輸出力矩 3 Times of Rated Output Torque				
額定輸入轉速 Rated Input Speed	n_{IN}	rpm	3 ~ 50	3,000	3,000	3,000	3,000	3,000
最大輸入轉速 Max. Input Speed	n_{IB}	rpm	3 ~ 50	5,000	5,000	5,000	5,000	5,000
背隙 Backlash		arcmin	3 ~ 50	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
扭轉剛性 Torsional Rigidity		Nm/arcmin	3 ~ 50	2.5	5	12	26	58
容許徑向力 Max. Radial Force	F_{2rB}	N	3 ~ 50	750	1,196	2,650	6,100	8,600
容許軸向力 Max. Axial Force	F_{2aB}	N	3 ~ 50	375	598	1,425	3,050	4,300
使用壽命 Service Life	L_H	hr	3 ~ 50	S5 周期運轉 : >30,000 (S1 連續運轉 : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
效率 Efficiency	η	%	3 ~ 50	≥ 94%				
使用溫度 Operating Temperature		°C	3 ~ 50	- 25° C ~ + 90° C				
潤滑 Lubrication			3 ~ 50	全合成潤滑油脂 Synthetic Grease				
防護等級 Protection Class			3 ~ 50	IP65				
安裝方向 Mounting Position			3 ~ 50	任意方向 Any				
噪音值 Noise Level		dB	3 ~ 50	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76
重量 Weight ±3%		Kg	3 ~ 50	0.87	1.86	3.7	9.322	15.256

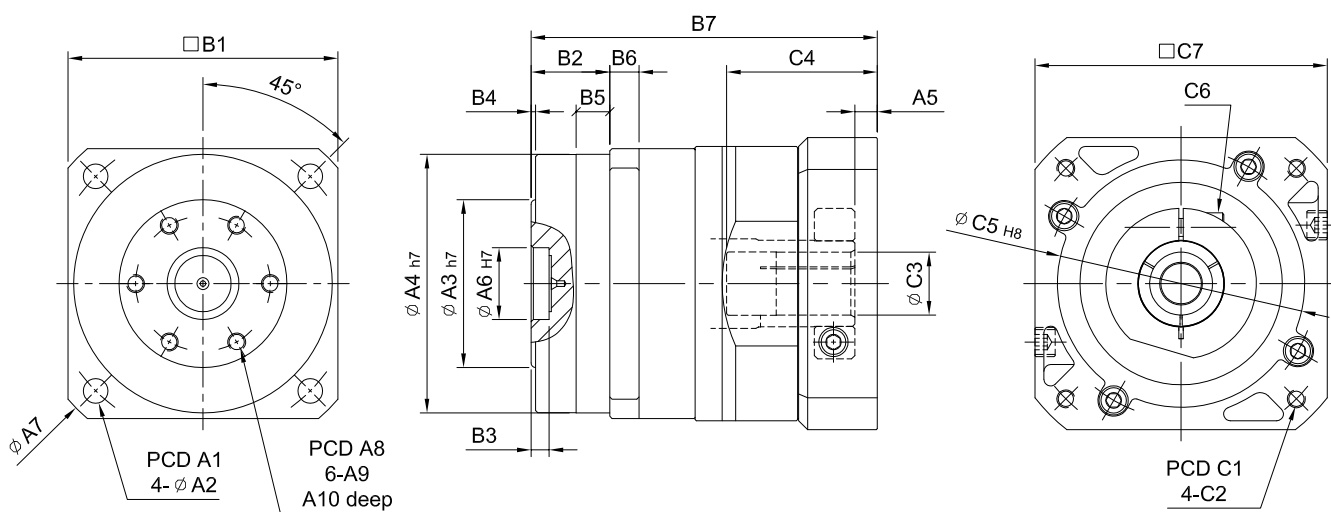
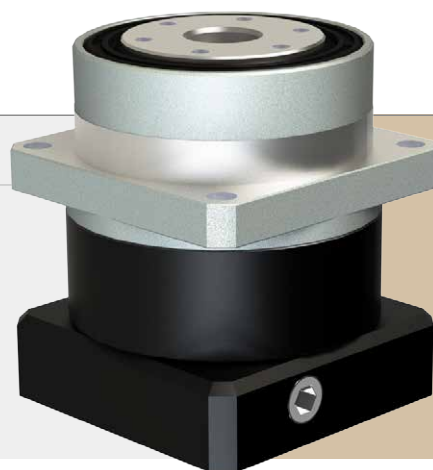
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	50	70	90	120	155
3 ~ 50	0.09	0.36	1.8	4.93	12.5

MODEL : FD

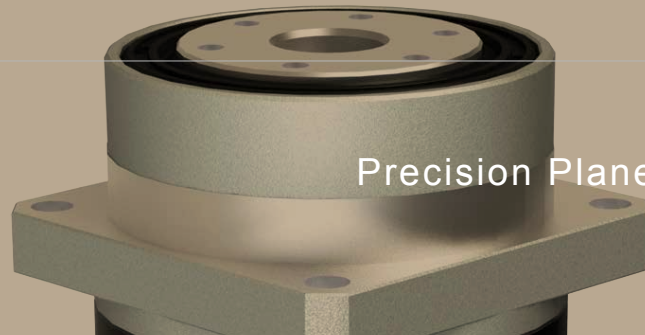
單段 1-Stage

RATIO : 3, 4, 5, 7, 10



unit: mm

	Model Code	60	90	120	170
A	A1	70	105	135	190
	A2	5.5	9	11	13
	A3	38	59.6	74.6	119.6
	A4	56	85	115	165
	A5	5.5	5.5 · 6	10	10
	A6	14	24	32	47
	A7	80	119	158	218
	A8	30	45	60	100
	A9	M4xP0.7	M6xP1.0	M8xP1.25	M8xP1.25
	A10	8	12	16	16
B	B1	60	90	120	170
	B2	21	27	35	53
	B3	5	5	8	10
	B4	1	1	2	2
	B5	8	11	15	22
	B6	8	10	13	16
	B7	70.5	89.5 · 97.5	154	162 · 184
C	C1	45 · 46 · 48.5 · 63 · 70	70 · 90	115 · 145 · 165	115 · 145 · 165 · 200
	C2	M3 · M4 · M5	M5 · M6	M6 · M8 · M10	M6 · M8 · M10 · M12
	C3	8 · 9 · 10 · 12.7 · 14	14 · 19	24 · 28 · 32	24 · 28 · 32 · 35 · 38
	C4	33	33.5 · 41.5	67	63 · 84.5
	C5	30 · 40 · 50	50 · 70	95 · 110 · 130	95 · 110 · 130 · 180
	C6	M4xP0.7	M5xP0.8	M8xP1.25	M8xP1.25
	C7	46 · 55 · 60	80	122 · 130 · 150	122 · 130 · 146 · 150 · 190



Precision Planetary Reducer

規格 Parameter	代號	單位 Unit	速比 Ratio	60	90	120	170
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	28	112	216	-
			4	38	110	208	491
			5	40	108	333	510
			7	35	105	309	473
			10	25	100	294	452
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	3~10	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque			
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	3~10	3 倍額定輸出力矩 3 Times of Rated Output Torque			
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	3~10	3,000			
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	3~10	5,000			
扭轉剛性 Torsional Rigidity		Nm/arcmin	3~10	4	12	27	49
容許徑向力 Max. Radial Force	F_{2rB}	N	3~10	460	1,400	2,260	3,300
容許軸向力 Max. Axial Force	F_{2aB}	N	3~10	230	660	1,130	1,650
使用壽命 Service Life	L_H	hr	3~10	S5 周期運轉 : >30,000(S1 連續運轉 : >15,000 小時) S5 Cycle Operation : >30,000(S1 Continuous Operation : >15,000hrs)			
效率 Efficiency	η	%	3~10	$\leq 97\%$			
使用溫度 Operating Temperature		°C	3~10	- 25° C ~ + 90° C			
潤滑 Lubrication			3~10	全合成潤滑油脂 Synthetic Grease			
防護等級 Protection Class			3~10	IP 65			
安裝方向 Mounting Position			3~10	任意方向 Any			
噪音值 Noise Level		dB	3~10	≤ 58	≤ 60	≤ 63	≤ 65
重量 Weight $\pm 2\%$		Kg	3~10	0.88	2.3		

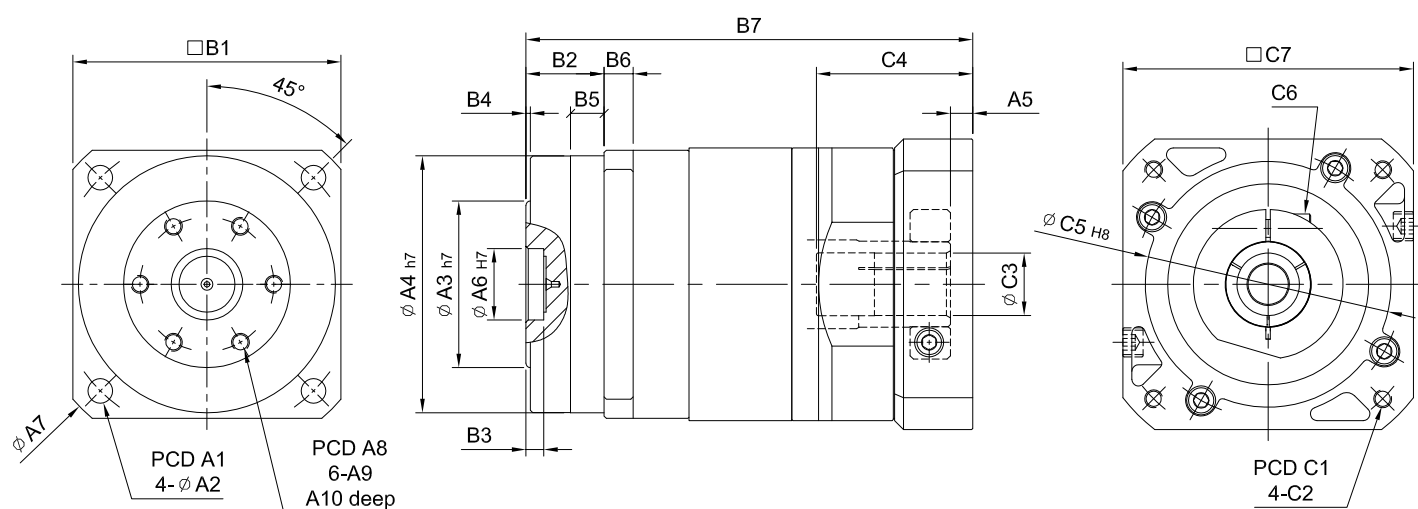
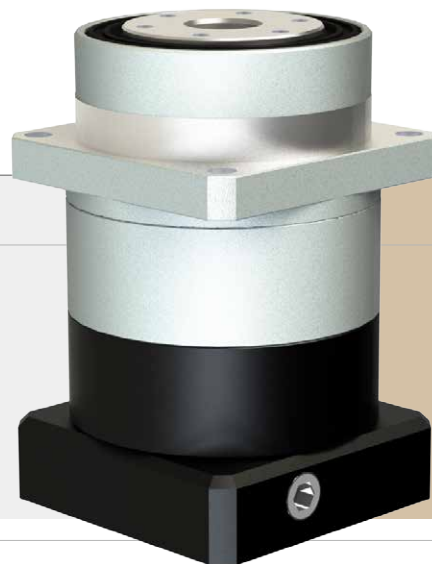
■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	60	90	120	170
3	0.16	0.48	3.21	-
4	0.12	0.45	2.8	6.63
5	0.1	0.4	2.71	6.63
7	0.08	0.35	2.54	6.55
10	0.06	0.32	2.51	6.46

MODEL : FD

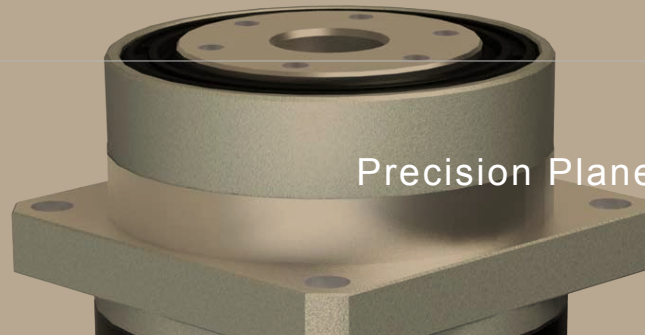
雙段 2-Stage

RATIO : 15, 20, 25, 30, 35, 40, 50, 70, 100



unit: mm

Model Code	60	90	120	170
A1	70	105	135	190
A2	5.5	9	11	13
A3	38	59.6	74.6	119.6
A4	56	85	115	165
A5	5.5	5.5 · 6	10	10
A6	14	24	32	47
A7	80	119	158	218
A8	30	45	60	100
A9	M4xP0.7	M6xP1.0	M8xP1.25	M8xP1.25
A10	8	12	16	16
B1	60	90	120	170
B2	21	27	35	53
B3	5	5	8	10
B4	1	1	2	2
B5	8	11	15	22
B6	8	10	13	16
B7	92.5	124.5 · 132.5	200	222 · 242
C1	45 · 46 · 48.5 · 63 · 70	70 · 90	115 · 145 · 165	115 · 145 · 165
C2	M3 · M4 · M5	M5 · M6	M6 · M8 · M10	M6 · M8 · M10
C3	8 · 9 · 10 · 12.7 · 14	14 · 19	24 · 28 · 32	24 · 28 · 32 · 35
C4	33	33.5 · 41.5	67	67 · 82
C5	30 · 40 · 50	50 · 70	95 · 110 · 130	95 · 110 · 130
C6	M4xP0.7	M5xP0.8	M8xP1.25	M8xP1.25
C7	46 · 55 · 60	80	122 · 130 · 150	122 · 130 · 150



Precision Planetary Reducer

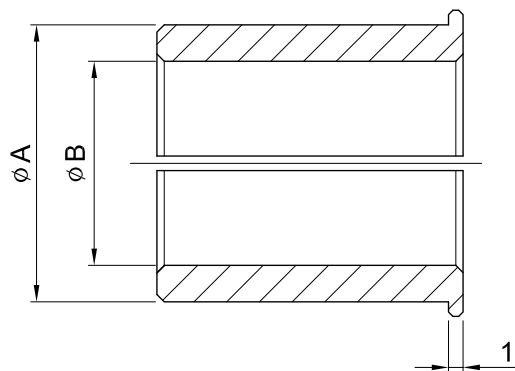
規格 Parameter	代號	單位 Unit	速比 Ratio	60	90	120	170
額定輸出扭矩 Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	15	112	216	-
			20	20	110	208	491
			25	25	108	333	510
			30	30	112	216	-
			35	35	105	309	473
			40	40	110	208	491
			50	50	108	333	510
			70	70	105	309	473
			100	100	100	294	542
最大加速扭矩 Max. Acceleration Torque	T_{2B}	Nm	15~100	1.8 倍額定輸出力矩 1.8 Times of Rated Output Torque			
最大輸出扭矩 Max. Output Torque 急停扭矩 Emergency Stop Torque	T_{2NOT}	Nm	15~100	3 倍額定輸出力矩 3 Times of Rated Output Torque			
額定輸入轉速 Rated Input Speed	n_{1N}	rpm	15~100	3,000			
最大輸入轉速 Max. Input Speed	n_{1B}	rpm	15~100	5,000			
扭轉剛性 Torsional Rigidity		Nm/arcmin	15~100	4	12	27	49
容許徑向力 Max. Radial Force	F_{2rB}	N	15~100	460	1,400	2,260	3,300
容許軸向力 Max. Axial Force	F_{2aB}	N	15~100	230	660	1,130	1,650
使用壽命 Service Life	L_H	hr	15~100	S5 周期運轉 : >30,000(S1 連續運轉 : >15,000 小時) S5 Cycle Operation : >30,000(S1 Continuous Operation : >15,000hrs)			
效率 Efficiency	η	%	15~100	$\leq 94\%$			
使用溫度 Operating Temperature		°C	15~100	$-25^{\circ}\text{C} \sim +90^{\circ}\text{C}$			
潤滑 Lubrication			15~100	全合成潤滑油脂 Synthetic Grease			
防護等級 Protection Class			15~100	IP 65			
安裝方向 Mounting Position			15~100	任意方向 Any			
噪音值 Noise Level		dB	15~100	≤ 58	≤ 62	≤ 65	≤ 67
重量 Weight $\pm 2\%$		Kg	15~100	1.24	3.3		

■ 轉動慣量 Mass Moments of Inertia (kg.cm²)

Ratio	60	90	120	170
15	50	0.45	3.21	-
20	68	0.42	2.8	6.63
25	22	0.42	2.71	6.63
30	50	0.42	3.21	-
35	63	0.42	2.54	6.55
40	68	0.42	2.8	6.63
50	72	0.42	2.71	6.63
70	63	0.42	2.54	6.55
100	45	0.42	2.51	6.46

Bushing

軸套



軸套內徑為所使用伺服馬達的輸出軸軸徑。下表中沒有的情況下需要插入軸套，在您所使用的輸出軸軸徑的近似值中選擇大值。

For motor shaft diameters not listed, gearboxes will be supplied with a bush to suit.

The bore sizes may be supplied as a larger bore with a bush.

連接軸 孔徑 Shaft Bore ϕA 軸套 孔徑 Bushing Bore ϕB	8	11	14	19	22	24	28	32	35
6	●	●							
6.35	●								
8		●							
9		●							
10			●						
11			●						
12			●						
12.7			●						
14				●					
15.85				●					
16				●		●	●		
19					●	●	●		
22						●	●	●	
24							●		●
28								●	●
32									●

Collet Locking Mechanism

筒夾式連結機構

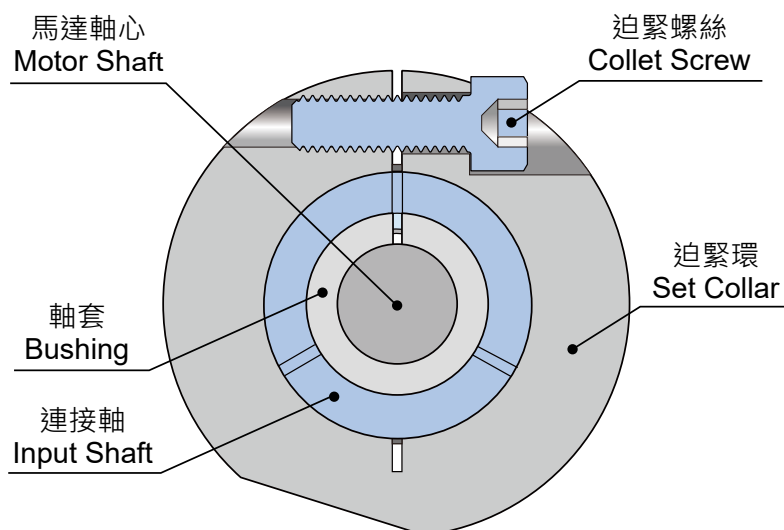
迫緊螺絲及迫緊環扭矩表 Collet Screw & Set Collar Torque Table

型號 Model													迫緊螺絲規格 Spec. of Collet Screw	螺絲強度等級 Screw Grade	螺絲鎖緊扭矩 Tighten Torque (Nm)	迫緊扭矩 Clench Torque (Nm)	鍵 key
SB SE	SBT PBT	SD	SR	SDH	SF	SA	PB	SN	SNL	FA	FB	FC FCL	M4 x P 0.7	12.9	4.83	87	
44	44	47	-	64	-	50	44	50 60	50 60 70	50	50	50					
62	62	64	82	90	62	70	62	70 80	80 90	70 80 90	70	70					
90	90 120	90	100	110	75	90	90	90 115	120	100	90	90					
120	142	110	132	140	100	120 160	120	120 155 160	155 160	120	120	120					
142	180	140	-	200	142	-	142	-	-	142	145	145					
180 220	-	200 255	-	255	180 220	-	180 220	-	-	180	180 220	-					
270 330	-	-	-	-	-	-	-	-	-	-	-	-	M12 x P 1.75	12.9	110	813	●

※ 馬達扭矩超過迫緊扭矩時，可能導致打滑。

It will cause slip when motor torque exceeds clench torque.

孔徑 Input Bore	Ø35	Ø38	Ø42	Ø48	Ø55	Ø60	Ø75
鍵 Key	10 x 8	10 x 8	12 x 8	14 x 9	16 x 10	18 x 11	20 x 12



Reference Selection Table of Motor

馬達選用參考表

單段 1-Stage

Model	SB SE	-	-	44	-	-	-	-	62	-	-	-	-	90	-	-	-	-	120	-	-	-	-	142	-	-	-	180	-	220	270	330	
	PB	-	-	44	-	-	-	-	62	-	-	-	-	90	-	-	-	-	120	-	-	-	-	142	-	-	-	180	-	220	-	-	
	SBL	-	44	-	-	-	-	-	62	-	-	-	-	90	-	-	-	-	-	-	120	-	-	-	142	-	-	-	180	-	220	-	-
	SBT SEL PBT	44	-	-	-	-	-	62	-	-	-	-	-	-	90	-	120	-	-	-	-	-	142	-	-	180	-	-	220	-	-	-	
	SD	-	47	-	-	-	-	-	64	-	-	-	-	90	-	-	-	-	-	-	-	110	-	-	140	-	-	-	200	-	255	-	-
	SDL	-	-	47	-	-	-	-	64	-	-	-	-	90	-	-	-	-	-	-	110	-	-	-	140	-	-	-	200	-	255	-	-
	SR	-	-	-	-	-	-	-	-	82	-	-	-	-	100	-	-	-	-	132	-	-	-	-	-	-	-	-	-	-	-	-	
	SF	-	-	-	-	-	-	-	62	-	-	-	-	75	-	-	-	-	-	-	-	100	-	-	142	-	-	-	180	-	220	-	-
	SFL	-	-	-	-	-	-	-	-	62	-	-	-	-	75	-	-	-	-	-	100	-	-	-	142	-	-	-	180	-	220	-	-
	SA	-	-	-	-	-	50	-	-	70	-	-	-	-	90	-	-	-	-	120 160	-	-	-	-	-	-	-	-	-	-	-	-	-
	SN	-	-	-	50	60	-	-	70	-	80	-	-	-	115	-	-	-	-	-	120	-	155 160	-	-	-	-	-	-	-	-	-	-
	SNL	-	50 60	-	-	-	-	70	-	-	-	-	80 90	-	-	-	120	-	-	-	-	-	-	-	-	-	155 160	-	-	-	-	-	-
	FA	-	-	-	50	-	-	-	70	-	-	80 90	-	-	100	-	-	-	120	-	-	-	-	-	142	-	-	-	180	-	-	-	-
	FB・FE	-	-	50	-	-	70	-	-	-	-	-	-	90	-	-	-	-	120	-	-	-	-	-	145	-	-	180	-	220	-	-	-
	FC	-	50	-	-	-	-	-	70	-	-	-	-	-	90	-	-	-	-	120	-	-	-	-	145	-	-	-	-	-	-	-	-
	FCL	-	50	-	-	-	-	-	-	70	-	-	-	-	90	-	-	-	-	120	-	-	-	-	145	-	-	-	-	-	-	-	-
	FN	-	50	-	-	-	-	-	70	-	-	-	-	-	90	-	-	-	-	120	-	-	-	-	155	-	-	-	-	-	-	-	-
	FNL	-	50	-	-	-	-	-	-	70	-	-	-	-	90	-	-	-	-	120	-	-	-	155	-	-	-	-	-	-	-	-	-
入力孔徑 Input Bore	容量 Power	8	8 11	8 9 11	8 10 11 14	8 9 10 12.7 14	11 14	11 14 19	11 14 16 19	14 19	14 16 19	16 19	14 19 22 24	16 19 22 24	19 22 24	19 24	19 22 24 28 32	22 24	22 24 28 32	24 28	24 28 32	24 28 32 35	24 28 32 35 38	28 32 35 38	28 32 35 38	32 35 38	35 38	35 38 42 48 55	35 38 42 48 55	42 48 55	38 42 48 65 70	48 55 60 65 75	
100 W		●	●	●	●	●																											
200 W			●	●	●	●	●	●																									
400 W					●	●	●	●	●	●	●	●	●	●																			
750 W							●	●	●	●	●	●	●	●	●																		
1 kW													●	●	●	●	●	●	●	●	●	●	●										
1.5 kW													●	●	●	●	●	●	●	●	●	●	●										
2.2 kW														●			●	●	●	●	●	●	●	●									
3.75 kW														●			●	●	●	●	●	●	●	●									
5.5 kW																						●	●	●	●	●	●	●					
7.5 kW																						●	●	●	●	●	●	●					
11 kW																											●	●	●	●			
15 kW																											●	●	●	●			
22 kW																											●	●	●	●	●		
30 kW																												●	●	●	●	●	
37 kW																																●	
45 kW																																●	
55 kW																																●	
75 kW																																●	

※ 以上表格僅供參考，選用時仍須以『額定輸出扭矩』為依據。The table is for reference. The selected model shall be based on rated output torque.

Glossary

減速機專用名詞解釋

速比 i

輸出轉速與輸入轉速的比值，減速比 = 輸入轉速 ÷ 輸出轉速。

例如：減速機輸入端轉速 $n_1=3000\text{RPM}$ ，輸入扭矩 $T_1=20\text{Nm}$ ，減速比為 10，或稱 $i=10$ ，

輸出端轉速 $n_2 = \text{輸入轉速 } n_1 / i = 300\text{RPM}$ 。

輸出端扭矩 $T_2 = \text{輸入扭矩 } T_1 \cdot i = 200\text{Nm}$ (不考慮效率時)

輸出端慣量 $J_2 = \text{輸入端慣量 } J_1 \cdot i^2$

Gear Ratio (i)

The gear ratio i indicates the factor by which the gearhead transforms the three relevant parameters of motion (speed, torque and mass moment of inertia). The factor is a result of the geometry of the gearing elements (Example: $i = 10$).

$$\begin{array}{lcl} n_1 = 3000 \text{ rpm} & \xrightarrow{\div i} & n_2 = 300 \text{ rpm} \\ T_1 = 20 \text{ Nm} & \xrightarrow{\cdot i} & T_2 = 200 \text{ Nm} \\ J_2 = 10 \text{ kgm}^2 & \xrightarrow{\cdot i^2} & J_1 = 0.10 \text{ kgm}^2 \end{array}$$

輸入轉速 n_1 [rpm]

減速機的驅動速度，如減速機與電機直接相連，則轉速值與電機轉速相同。

Input Speed (n_1) [rpm]

Input Speed is same as motor speed, if the motor direct connected gearbox.

輸出轉速 n_2 [rpm]

輸出轉速按照下列公式通過輸入轉速 n_1 和傳動比 i 計算出來。

$$n_2 = \frac{n_1}{i}$$

Output Speed (n_2) [rpm]

The output speed is caculated by the formula related to input speed n_1 and reduction ratio i .

額定輸入轉速 n_{1N} [rpm]

連續運轉模式 (S1)，輸入轉速須小於等於額定輸入轉速，本目錄中的額定輸入轉速是在環境溫度為 20°C 的條件下測得的，環境溫度較高時，或齒箱表面溫度超過 90°C 請降低輸入轉速 n_1 。

Nominal Input Speed (n_{1N}) [rpm]

Input speed of gearbox shall be less than nominal input speed in the model of continuous operation (S1). Nominal input speed (n_{1N}) is measured at environment temperature 20°C . If the environment temperature is higher or the temperature of gearbox surface exceeds 90°C , please lower input speed (n_1).

Glossary

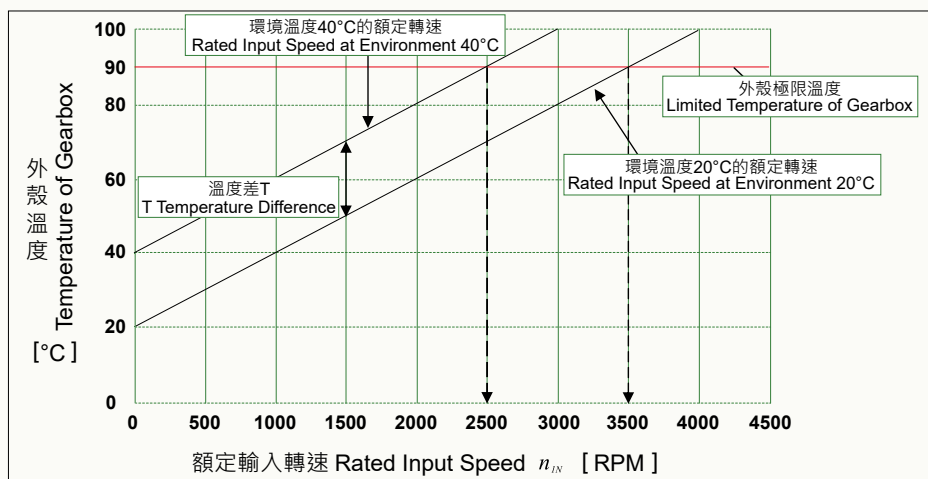
減速機專用名詞解釋

轉速 n [rpm]

減速機選型時必須要考慮的兩個轉速是最大輸入轉速和額定輸入轉速。為間歇工作制選用減速機時，要考慮不能超過最大輸入轉速 n_{1B} 。為連續工作制選用減速機時，要考慮不能超出額定輸入轉速 n_{1N} 。額定轉速受到減速機外殼溫度的限制，這個溫度不能超過 90°C 。從下圖中可以看出，環境溫度越高時，減速機的溫度也提前達到額定溫度。換句話說，在環境溫度高時必須降低轉速。

Speed (n) [rpm]

Two speeds are of relevance when selecting a gearbox: the maximum speed and the nominal speed at the input. The maximum permissible speed n_{1B} must not be exceeded because it serves as the basis at cyclic operation. The nominal speed n_{1N} must not be exceeded at continuous operation. The housing temperature limits the nominal speed, which must not exceed 90°C . The nominal input speed specified in the catalogue applies to an ambient temperature of 20°C . As can be seen in the diagram below, the temperature limit is reached more quickly in the presence of an elevated outside temperature. In other words, the nominal input speed must be reduced if the ambient temperature is high. The values applicable to your gearbox are available from LIMING on request.



背隙等級 P2, 背隙 <8 arcmin, 額定轉矩輸出
P2, Backlash <8 arcmin, Rated Torque Output

- A. 背隙愈小、溫升愈高、背隙 P0(<3ArcMin) 時平均上升 3~5 度。
- B. 背隙為 Ps 時 (<1ArcMin) 時平均上升 5~10 度。
- C. 背隙為 Ps、P0 時適用於 S5 間歇運轉模式，背隙 P2 可用於 S1 連續運轉模式。
- D. 背隙為 Ps、P0 時，入力轉速應在額定輸入轉速 (Rated Input Speed) 以內。
- E. 輸入轉速為最大輸入轉速 (Max Input Speed) 適用於 S5 間歇運轉模式。
- F. 特殊運用場合請與本公司連繫。

- A. The smaller the backlash, the higher the temperature rise. When the backlash P0 ("<3" arcmin), the average rise is 3~5 degrees.
- B. When the backlash is Ps (<1 arcmin), the average rise is 5~10 degrees.
- C. When the backlash is Ps and P0, it is suitable for cyclic operation S5, and the backlash P2 can be used for continuous operation S1.
- D. When the backlash is Ps and P0, the input rotation speed should be within the Rated Input Speed.
- E. The Max Input Speed is suitable for cyclic operation S5.
- F. Please contact our company for special applications.

Glossary

減速機專用名詞解釋

最大輸入轉速 n_{1B} [rpm]

適用間歇工作制模式 (S5)。本目錄中的最大輸入轉速是在環境溫度為 20°C 的條件下測得的，環境溫度較高時，或齒箱表面溫度超過 90°C 請降低輸入轉速 n_1 。

Max Input Speed (n_{1B}) [rpm]

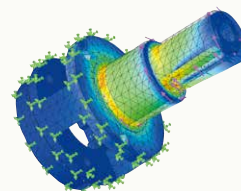
It is applied to cyclic operation (S5). Max. input speed is measured at environment temperature 20°C. If the environment temperature is higher or the temperature of gearbox surface exceeds 90°C, please lower input speed (n_1).

額定輸出扭矩 T_{2N} [Nm]

指減速機長時間（連續工作制）可以加載的扭矩（無磨損）。

Nominal torque (Rated Output Torque) (T_{2N}) [Nm]

The nominal torque T_{2N} is the torque continuously transmitted by a gearbox during a long period of time, i.e. in continuous operation (without wear).



CAE 分析 CAE Analysis

加速扭矩 T_{2B} [Nm]

指工作周期每小時少於 1000 次時允許短時間加載到輸出端的最大扭矩。工作周期每小時大於 1000 次時，須考慮沖擊因素。 T_{2B} 是周期工作制選型時的最大值，實際使用中的加速扭矩 (T_{2b}) 必須小於 T_{2B} 。否則會縮短減速機的壽命。

Acceleration Torque (T_{2B}) [Nm]

The acceleration torque T_{2B} is the maximum permissible torque that can briefly be transmitted at the gearbox output end under the duty cycle < 1000/h cycles. For > 1000/h cycles, the impact factor must be taken into account. T_{2B} is the max. parameter in cyclic operation. Application acceleration torque (T_{2b}) shall be smaller than T_{2B} ; otherwise the gearbox service life will be reduced.

空載扭矩 T_{012} [Nm]

指加載到減速機上以克服齒輪箱內的摩擦力的扭矩。

No Load Running Torque (T_{012}) [Nm]

The no load running torque is the torque which must be applied to a gearbox in order to overcome the internal friction; it is therefore considered lost torque.

逆轉扭矩 [Nm]

從出力軸端施力，開始旋轉時的最小扭矩，較大的型號或較高的減速比需要較大的扭矩來逆轉。

Back Driving Torque [Nm]

The back driving torque is the minimum torque to start the rotation from the output side of gearbox. A larger size or a higher ratio gearbox requires greater back driving torque.

Glossary

減速機專用名詞解釋

急停扭矩 (最大輸出扭矩) T_{2NOT} [Nm]

指減速機輸出端所能加載的最大扭矩。這個扭矩可在減速機壽命期內加載 1000 次。超過 1000 次可能會造成內部零件的破壞。(備註：SERVOBOX 系列機型為 $T_{2NOT} = 3 \cdot T_{2N}$ ；即 3 倍額定輸出扭矩)。

Emergency Stop Torque (Max. Output Torque) (T_{2NOT}) [Nm]

The emergency stop torque T_{2NOT} is the maximum permissible torque at the gearbox output end and must not be reached more than 1000 times during the service life of the gearbox. It must never be exceeded to prevent inside parts from damage. LIMING SERVOBOX $T_{2NOT} = 3 \cdot T_{2B}$ (3 times of rated output torque)

平均壽命 [h]

指減速機在週期運轉、額定負載下，額定輸入轉速時的工作時間，連續運轉使用時降低使用壽命 1/2。平均壽命，不是任何具體的減速機實際使用壽命的保證，它是一個平均「計算壽命」，衍生自產業公式 (註)，專有的計算和假設，和其他因素，例如實際測試結果或模擬軟件 (CAE)。這些因素考慮到金屬材料，熱處理，齒輪和軸承的設計等。實際的使用壽命，根據客戶的應用及實際現場條件，可能與標稱的使用壽命有差異。

Average Service Life [h]

Average service life is the working time of gearbox running at rated loading and nominal input speed at cyclic operation.

The service life is not a guarantee of the actual service life of the gear reducer. It is an average calculated life derived from industry formulas (*), and other factors such as running test results, CAE (Computer Aided Engineering) software and so on. These factors take into consideration the metal composition, heat treatment, the design of the gearing and bearings, as well as calculated loads. Service life calculations are not based on actual field conditions or applications, and do not represent a guarantee with respect to expected life, performance, or other characteristics of gear reducer in any given application or use. The actual service life could vary substantially from the nominal service life.

註：產業公式參考以下組織所訂之標準 Industry formula Refer to the following standardization organization
GB/T 3480-1997, ISO 6336-1~6336-3:1996

ISO: 國際標準組織 International Organization for Standardization

GB: 中華人民共和國國家標準 (國標 GB) Guobiao standards (Chinese National Standards)

DIN: 德國標準 Deutsches Institut für Normung : (German Institute for Standardization)

AGMA: 美國齒輪製造協會 American Gear Manufacturers Association

JIS: 日本標準協會 Japanese Standards Association

軸向力 F_{2A} [N]

是指平行於軸心的一個力，它平行於輸出軸，它的作用點與輸出軸端有一定的軸向偏 (y_2) 時，會形成一個額外的彎撓扭矩。軸向力超過樣本所示的額定值時，須用聯軸器來抵消這種彎撓力。

Axial Force (F_{2A}) [N]

The axial force F_{2A} acting on a gearbox runs parallel to its output shaft. The force runs perpendicular to its output shaft. It may be applied with axial offset via a lever arm y_2 under certain circumstances, in which case it also generates a bending moment. If the axial force exceeds the permissible catalogue values, additional design features (e.g. couplings) must be implemented to absorb these forces.

Glossary

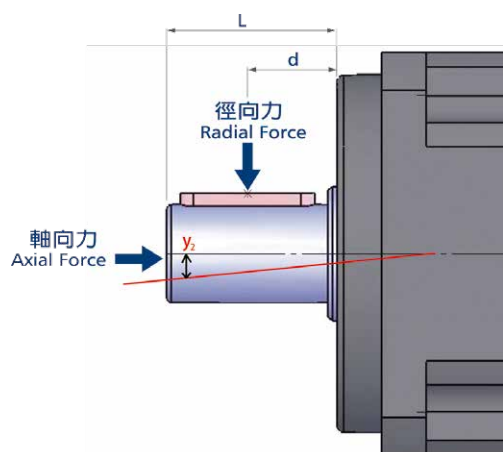
減速機專用名詞解釋

徑向力 F_{2R} [N]

指垂直作用於軸向力的一個力。它的作用點與軸端有一定的軸向距離 (d)，這個點成一個槓桿點，橫向力形成一個彎撓扭矩。

Radial Force (F_{2R}) [N]

The radial force is the force acting at right angles to axial force. It acts perpendicular to the axial force and can assume an axial distance of (d) in relation to the shaft end, which acts as a lever arm. The radial force produces a bending moment.



從減速機出力軸連接鏈條齒輪等傳動機構時，會承受徑向力，徑向力。OHL 的計算公式如下：

$$OHL = \frac{T \cdot s \cdot f \cdot p}{R}$$

T = 機構端扭力 s = 負荷系數
 f = 驅動方式的載重系數 R = 皮帶輪或鏈輪半徑
 p = 位置系數：負載點小於等於 d 時， $p=1$
 負載點大於 d 時， $p=1.5$

The gearbox will bear radial force while its output shaft connected with transmission machinery, such as chain pulley. The O.H.L. formula of radial force is as below :

$$OHL = \frac{T \cdot s \cdot f \cdot p}{R}$$

T = Torque of transmission machinery
 s = Service factor
 f = Driven Coefficient
 R = Radius of pulley or chain wheel
 p = Position Factor: loading position less than d , $p=1$
 loading position larger than d , $p=1.5$

軸伸徑向載荷、軸向載荷

選擇減速機的附加依據是輸出軸伸出端上的徑向載荷和軸向載荷。軸的強度和軸承的承載能力決定了許用軸伸的徑向載荷。產品樣本中給出的最大允許值是指在最不利的方向作用在軸伸出端中點（即 $1/2L$ 處）的力。當作用力不在中點時。越接近軸肩，允許的徑向載荷就越大；相反，作用點離軸肩越遠，允許的徑向載荷就越小。

Shaft Extension Radial Load, Axial Load

Additional concerned for selecting the gear box is the radial load and axial load on the extended end of the output shaft. The strength of the shaft and the load-bearing capacity of the bearing determine the allowable radial load of the shaft extension. The maximum allowable value given in the product catalog refers to the force acting in the most unfavorable direction at the midpoint of the extended end of the shaft (i.e. at $1/2L$). When the force is not at the midpoint. The closer to the shaft shoulder, the greater the allowable radial load; conversely, the farther the point of action is from the shaft shoulder, the smaller the allowable radial load.

荷系數表 (s) Service factor table				
傳動機負荷等級 Loading classification	每日使用時間 Running per Day			
	0.50 hr	2 hr	8-10 hr	10-24 hr
均一負荷 Uniform	0.80	0.90	1.00	1.25
中衝擊 Medium shock	0.90	1.00	1.25	1.50
重衝擊 Heavy shock	1.00	1.25	1.50	1.75

驅動方式載重系數 Driven Coefficient (f)	
驅動方式 Driving Mode	(f)
鏈條、齒型皮帶 Chain Pulley	1.00
齒輪 Gear	1.25
V 型皮帶 V-Belt	1.50
平皮帶 Flat-Belt	2.50

● 正轉、逆轉或起動、停止，1 小時內達 10 次以上者，請將右表的值乘以 1.2。

CW/CCW operation or start-up/stop reaches 10 times or more within 1 hour, please multiply by 1.2.

Glossary

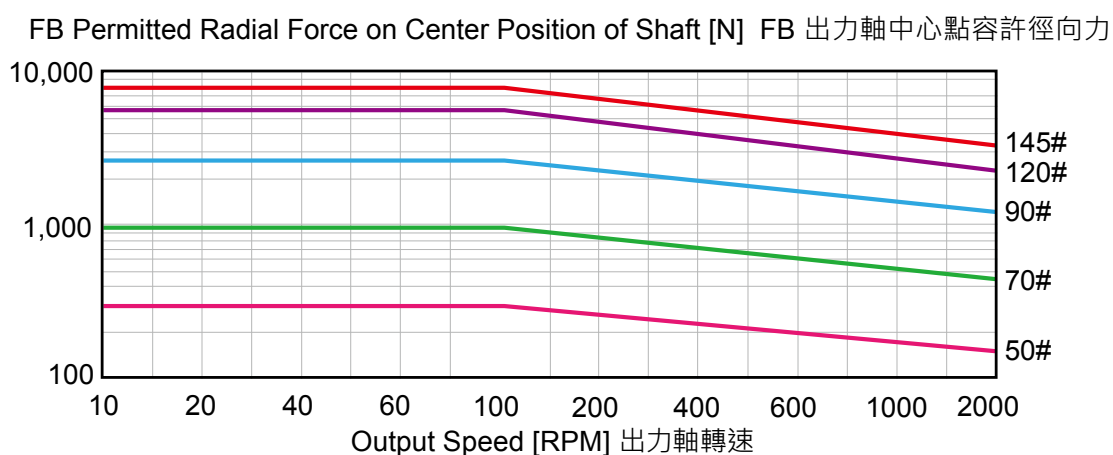
減速機專用名詞解釋

容許徑向力 F_{2rB} [N]

當輸出轉速為 100RPM，徑向作用力在出力軸 1/2 處時所容許之最大力，轉速增加時遞減。

Permitted Radial Force (F_{2rB}) [N]

The maximum allowed radial force in the 1/2 position of output shaft in the condition of output speed 100 RPM. This value is decreasing when the running speed is increasing.



容許軸向力 F_{2aB} [N]

當輸出轉速為 100RPM 時，最大容許之軸向作用力。

Permitted Axial Force (F_{2aB}) [N]

The maximum allowed axial force in the condition of output speed 100 RPM.

傳動效率 η [%]

由於摩擦引起的損失總是使有效率小於 1，也就是少於 100%。樣本上的效率是齒輪箱在額定負載情況下，減速機的傳輸效率。

Transmission efficiency η [%]

Efficiency (η) is the ratio of output power to input power. Power lost through friction reduces efficiency to less than 1 or 100%.

$$\eta = \frac{P_{out}}{P_{in}} = \frac{P_{in} - P_{lost}}{P_{in}}$$

Glossary

減速機專用名詞解釋

噪音 [dB]

樣本上的數值是輸入轉速為 3000rpm，減速比 $i=10$ ，或 $i=100$ (2 段時)，不帶負載，離減速機一米距離時測量的。一般而言電機轉速越高時，噪音越高；負載越大時，噪音越大。

Noise Level [dB]

The operating noise specified in our catalog relates to gearboxes with the ratio $i=10$ or $i=100$ (2 stage) at input speed 3,000 rpm and no loading running. Noise level is measured at 1M distance from the gearbox. Higher speed results to higher noise level; higher loading results to higher noise level.

轉動慣量 J [Kg.cm²]

表示一個物體盡力保持自己轉動狀態（或靜止或轉動）特性的一個值。樣本中的值均指輸入端。

Mass moment of inertia (J) [Kg.cm²]

The mass moment of inertia J is a measurement of the effort applied by an object to maintain its momentary condition (at rest or moving).

慣量比 λ

是指負載慣量與傳動系統慣量（電機加上減速機）之間的比值。這個比值決定了系統的可控性。 λ 值越大，也就是各轉動慣量差值越大，高動態的動作過程就越難精確控制，建議盡可能將入值控制在 < 5 。減速機可以將負載慣量降低 $1/i^2$ 。

Rate of mass moment of inertia (λ)

The ratio of mass moment of inertia λ is the ratio of external inertia (application side) to internal inertia (motor and gearbox). It is an important parameter determining the controllability of an application. Accurate control of dynamic processes becomes more difficult with differing mass moments of inertia and as λ becomes greater. LIMING recommends that a guideline value of $\lambda < 5$ is maintained. A gearbox reduces the external mass moment of inertia by a factor of $1/i^2$.

Simple applications ≤ 10

Dynamic applications ≤ 5

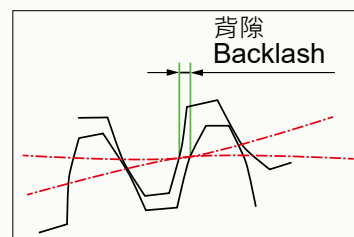
Highly dynamic applications ≤ 1

回程間隙 j_t [arcmin]

指減速機輸出軸與輸入端的最大偏差角，測量時先將齒輪輸入端固定住，然後在輸出軸加載額定扭矩的 2% 扭矩，減速機輸出端有一個微小的角位移，此角位移即為回程間隙。單位是 " 弧分 "，即一度的六十分之一度。

Torsional Backlash (j_t) [arcmin]

Torsional backlash j_t is the maximum angle of torsion of the output shaft in relation to the input. Torsional backlash is measured with the input shaft locked. The output is then loaded with a defined test torque (2% rated output torque) in order to overcome the internal gearhead friction. The main factor affecting torsional backlash is the face clearance between the gear teeth.



Glossary

減速機專用名詞解釋

弧分 [Arcmin]

一個圓有 360 度，1 度可分為 60 弧分，即一個圓有 21600 弧分，如回程間隙標為 1 arcmin 時，意思是說減速機轉一圈，輸出端的角偏差 $1/60^\circ$ 。

在實際應用中，這個角偏差與軸直徑及轉盤大小有關。

例如：輸出端轉盤半徑為 500mm 時，齒輪箱精度為 $j_t = 3'$ 時，減速機轉一圈的偏差為 $b = 0.44\text{mm}$ 。

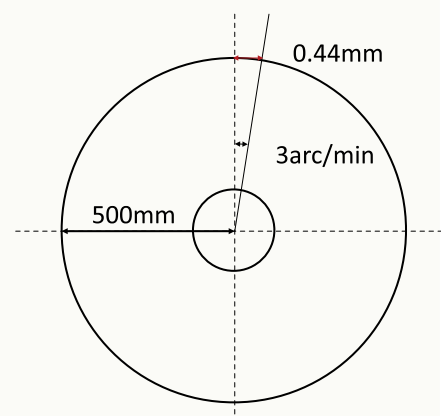
$$b = \frac{2 \cdot \pi \cdot r \cdot j_t}{21600}$$

Angular minute [Arcmin]

A degree is subdivided into 60 angular minutes ($= 60 \text{ arcmin} = 60'$). In other words, if the torsional backlash is specified as 1 arcmin, for example, the output can be turned $1/60^\circ$. The repercussions for the actual application are determined by the arc length.

EX: A pinion with a radius $r = 500 \text{ mm}$ on a gearhead with standard torsional backlash $j_t = 3'$ can be turned $b = 0.44 \text{ mm}$.

$$b = \frac{2 \cdot \pi \cdot r \cdot j_t}{21600}$$



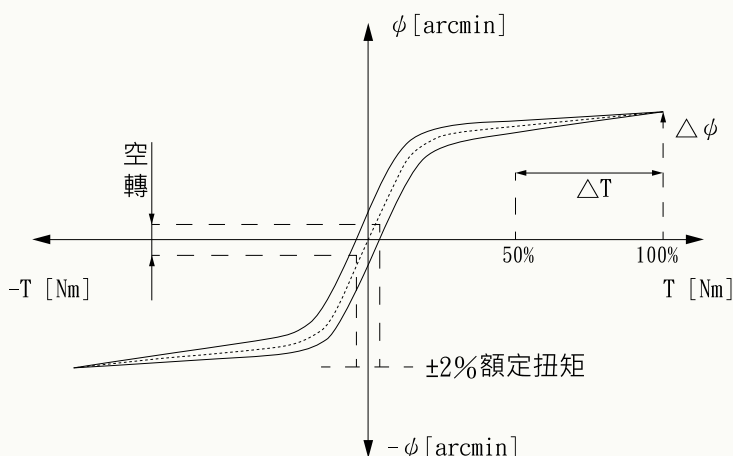
遲滯曲線

遲滯檢測是為了得出減速機的扭轉剛度，通過檢測得到遲滯曲線。檢測時，先將減速機輸入端固定住，然後在輸出端的兩個旋轉方向分別持續地加載到 T_{2B} 最大加速扭矩，繼而逐步卸載，用儀器記錄下扭矩的仿差角，得到的曲線是一條閉合曲線，從中可以計算出減速機的回程間隙 (j_t) 和扭轉剛度 (C_{t21})。

Hysteresis Curve

The hysteresis is measured to determine the torsional rigidity of a gearbox. The result of this measurement is known as the hysteresis curve. If the input shaft is locked, the gearhead is loaded with a torque that increases continuously up to T_{2B} and is then relieved at the output in both directions. The torsional angle is plotted against the torque. This yields a closed curve from which the torsional backlash and torsional rigidity can be calculated.

$$C_{t21} = \frac{\Delta T}{\Delta \phi}$$



Glossary

減速機專用名詞解釋

扭轉剛度 C_{t21} [Nm/Arcmin]

由加載力距和所產生的扭轉角之間的比率來定義。
$$C_{t21} = \frac{\Delta T}{\Delta \phi}$$

它說明需要用多大的扭矩才能把輸出軸轉動一弧分。扭轉剛度是從遲滯曲線得出的。在曲線圖上只需要關注 T_{2B} 的 50% 和 100% 這個範圍，這個範圍內，曲線可看成是一條直線。

Torsional rigidity (C_{t21}) [Nm/Arcmin]

Torsional rigidity is defined as the quotient of applied torque and generated torsion angle.

$$C_{t21} = \frac{\Delta T}{\Delta \phi}$$

It consequently shows the torque required to turn the output shaft by one angular minute. The torsional rigidity can be determined from the hysteresis curve. Only the area between 50% and 100% of T_{2B} is considered because this area of the curve profile can be considered linear.

運轉模式

選擇減速機時必需考慮運轉的模式。(連續運轉 S1，週期運轉模式 S5)

Operating modes

(continuous operation S1 and cyclic operation S5)

When selecting a gearbox, it is important to consider whether the motion profile is characterized by frequent acceleration and deceleration phases in cyclic operation (S5) as well as pauses, or whether it is designed for continuous operation (S1), i.e. with long phases of constant motion.

連續運轉模式 (S1)

連續運轉模式有工作週期所定義，假如工作週期 ED 大於 60%，或連續運轉時間大於 20 分鐘，則為連續運轉模式 (S1)。

Continuous operation (S1)

Continuous operation is defined by the duty cycle. If the duty cycle is greater than 60% or longer than 20 minutes, this qualifies as continuous operation.

週期運轉模式 (S5)

連續運轉模式有工作週期所定義，假如工作週期 ED 小於 60%，或連續運轉時間小於 20 分鐘，則為週期運轉模式 (S5)。

Cyclic operation (S5)

Cyclic operation is defined by the duty cycle. If the duty cycle is less than 60% and shorter than 20 minutes, it qualified as cyclic operation.

Glossary

減速機專用名詞解釋

工作週期 (ED)

$$t_{\text{work}} = t_{\text{加速}} + t_{\text{勻速}} + t_{\text{減速}} = t_a + t_c + t_d$$

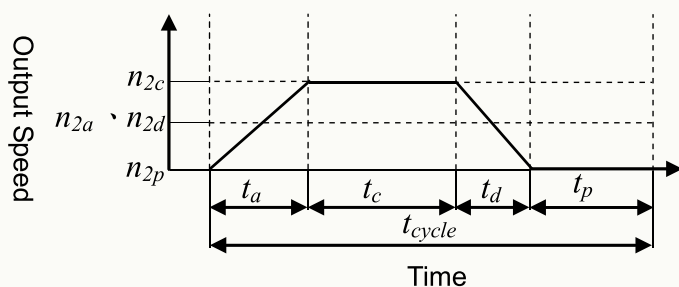
$$t_{\text{cycle}} = t_{\text{加速}} + t_{\text{勻速}} + t_{\text{減速}} + t_{\text{暫停}} = t_a + t_c + t_d + t_p$$

$$ED[\%] = t_{\text{work}} / t_{\text{cycle}} \times 100\%$$

$$ED[\text{min}] = t_{\text{work}}$$

Duty cycle (ED)

The duty cycle ED is determined by one cycle. The times for acceleration (t_a), constant travel if applicable (t_c) and deceleration (t_d) combined yield the duty cycle in minutes. The duty cycle is expressed as a percentage with inclusion of the pause time t_p .



$$ED = \frac{t_a + t_c + t_d}{t_{\text{cycle}}}, t_{\text{work}} = t_a + t_c + t_d$$

t_a Acceleration , t_c Constant ,

t_d Deceleration , t_p Pause

段數 (級數)

太陽輪及行星輪構成獨立的減速輪系，如減速機內只一個輪系，稱 1 段 (級)，SERVOBOX 系列行星減速機，1 段 (級) 減速比從 1/3~1/10，2 段 (級) 減速比從 1/15~1/100，為得到較大減速比，須多段 (級) 傳動，透過模組化設計，可結合多個輪系，減速比可達 100~100000 以上。

Stage

The sun gear and planetary gear forms an independent speed reduction gear system. If there is only one gear system in the gear reducer, it is defined as one stage transmission. In order to achieve higher speed reduction ratio, multiple stages transmission is required. LIMING's standard gear reducers are classified into one stage and two-stage transmission. Speed reduction ratio range is from 3 to 100. The modular construction combined with multiple stages transmission allows speed reduction ratio 100~100,000 and over.



Glossary

減速機專用名詞解釋

防護等級 (IP)

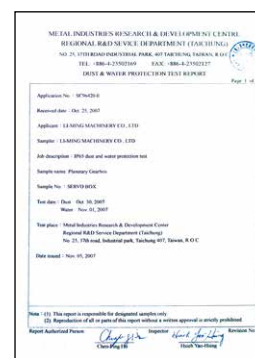
本公司產品採用密封式全油封設計，確保潤滑油脂不洩漏 (IP65)。

防護等級 (IP) 是由 IEC 60529 標準所制訂，其二位數，分別代表固體顆粒與液體的侵入防護等級。

Degree of protection (IP)

The protective class IP65 sealed design avoids leakage problem.

The various degrees of protection are defined in IEC 60529 “Degrees of protection offered by enclosure (IP code)”. The IP degree of protection (IP stands for International Protection) is represented by two digits. The first digit indicates the protection against the ingress of impurities and the second the protection against the ingress of water.



● 金屬工業研究發展中心 IP65 測試報告

IP65 Test Report by Metal Industries & Development Center.

體物件防護 Protection against contact and against solid foreign objects.		液體防護 Protection against ingress of water.	
第一位數 1st numeral	說明 Description	第二位數 2 nd numeral	說明 Description
0	無防護 Non-protected	0	無防護 Non-protected
1	可阻擋大於 50mm 的物體 Protected against solid foreign objects of >50mm Ø	1	可阻擋垂直落下的液體 Protected against vertically falling water drops
2	可阻擋大於 12.5mm 的物體 Protected against solid foreign objects of >12.5mm Ø	2	可阻擋垂直到 15 度角的噴灑液體 Protected against vertically falling water drops when enclosure tilted up to 15°
3	可阻擋大於 2.5mm 的物體 Protected against solid foreign objects of >2.5mm Ø	3	可阻擋垂直到 60 度角的噴灑液體 Protected against spraying water when enclosure tilted up to 60°
4	可阻擋大於 1mm 的物體 Protected against solid foreign objects of >1.0mm Ø	4	可阻擋到所有角度的噴灑液體 Protected against splashing water
5	防塵 (無可構成損壞的堆積) Protected against ingress of dust (dust-protected)	5	可阻擋低壓水柱 Protected against water jets
6	無塵 Protected against ingress of dust by underpressure (dust-tight)	6	可阻擋高壓水柱 Protected against powerful water jets
		7	防護短時進水 Protected against the effects of temporary immersion in water
		8	防護長期進水 Protected against the effects of continuous immersion in water

Glossary

減速機專用名詞解釋

工作溫度

是指減速機在連續工作和週期工作狀態下所能允許的溫度。目前 SERVBOX 系列的減速機能在 $-25^{\circ}\text{C} \sim +90^{\circ}\text{C}$ 度環境下工作。考慮工作溫升，環境溫度應在 $-25^{\circ}\text{C} \sim +45^{\circ}\text{C}$ 之間。

Operating Temperature

The Operating Temperature indicates the allowable temperature of gearbox at continuous and cyclic operation SERVBOX series work in $-25^{\circ}\text{C} \sim +90^{\circ}\text{C}$.

Consider working temperature, ambient temperature should be in $-25^{\circ}\text{C} \sim +45^{\circ}\text{C}$.

潤滑

行星減速機在整個使用期間無需更換潤滑油。本公司標準品使用全合成潤滑脂 (0 號)，可視情況選用其他潤滑油。

Lubrication

It's no essential to replace lubricant during the service life. Lubrication of standard products uses synthetic grease (0#). It depends on the application, there are other grease available.

筒夾式鎖緊機構

利用摩擦力連接馬達軸心及減速機，並經動平衡分析，以確保在高輸入轉速下結合面的同心度和零背隙的動力傳遞。

Collet Clamping

The Collet Clamping ensure a frictional between motor shaft and gearbox. It has passed dynamical balance analysis to assure concentricity and no backlash at high input speed operation.

軸套

當馬達軸徑比減速機入力孔小時，需要一個軸套去補償尺寸才能夾緊。

Bushing

If the motor shaft diameter is smaller than the input bore of gearbox, a bushing is used to compensate the difference in diameter.

Glossary

減速機專用名詞解釋

連接版設計

適合各種廠牌伺服馬達及其它馬達安裝，安裝最容易。本型錄只列出一般尺寸，需要其它尺寸時，請上本公司網站查詢。

Design of connecting plate

Design of connecting plate is suitable for various servo motors or others, and also easy for installation. General dimension is shown on the catalogue. Please find other dimensions from our website.



馬達品牌 Motor Brand: MITSUBISHI
馬達型號 Motor Model: HC-SF553

參數值 Value	單位 Unit
輸出功率 Output Power	0.5 Kw
額定力矩 Rated Torque	1.59 NM
最大力矩 Max. Torque	4.77 NM
額定轉速 Rated Speed	3000 RPM
最大轉速 Max. Speed	3000 RPM
轉動慣量 Inertia	6.6 kg/cm ²
軸徑 Shaft Dia.	24 mm
外徑 Diameter	130 mm
凸緣	110 mm
PCD	145 mm

1-1.輸入減速機之減速比 Input GEAR Ratio 10
1-2.輸入減速機之TYPE: SB



STEP1 STEP2 STEP3 STEP4

1-1.輸入減速機之減速比 Input GEAR Ratio 3
1-2.輸入伺服馬達軸徑 Motor Shaft D/A, A 19
1. 下一步 Next Step

伺服馬達 Servomotor

D C

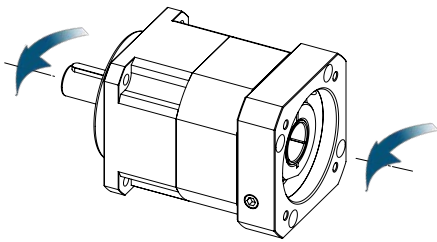


Rotation Directions

旋轉方向

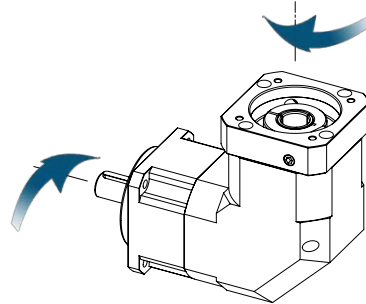
單段行星減速機

1-Stage Planetary Reducer



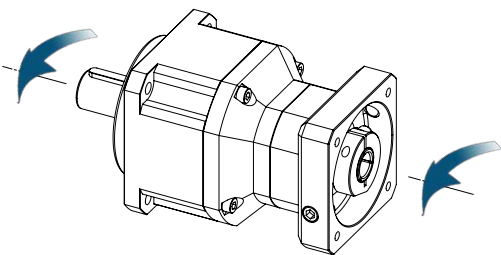
單段傘齒行星減速機

1-Stage Spiral Bevel Gear & Planetary Reducer



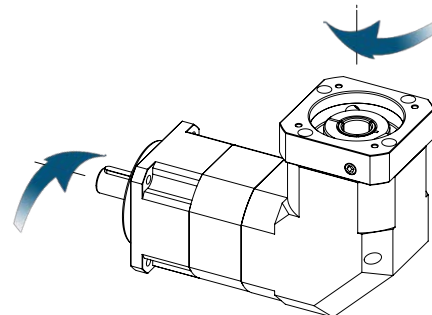
雙段行星減速機

2-Stage Planetary Reducer



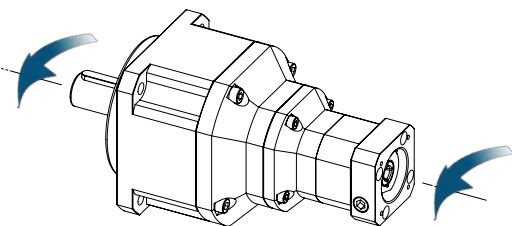
雙段傘齒行星減速機

2-Stage Spiral Bevel Gear & Planetary Reducer



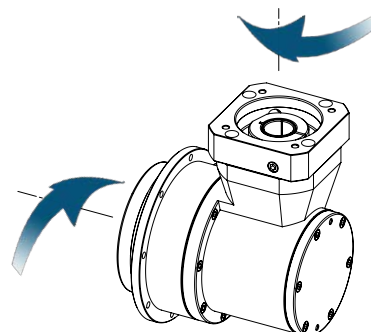
三段行星減速機

3-Stage Planetary Reducer



單段戟齒輪行星減速機

1-Stage Hypoid Gear & Planetary Reducer



1. 計算減速比 i (公式 1)



2. 計算應用端平均扭矩 T_{2m} (公式 2)
應用端平均扭矩 $T_{2m} < \text{額定輸出扭矩 } T_{2N}$



3. 判斷運轉模式 (S1 或 S5)
S5: 負載運轉週期 $ED < 60\%$
S5: 負載運轉時間 $t_{work} < 20$ 分鐘 (公式 3)



4. 假如運轉模式為週期性運轉模式 (S5)
計算應用端最大加速扭矩 T_{2max} (公式 4)
應用端最大加速扭矩 $T_{2max} < \text{最大加速扭矩 } T_{2B}$



5. 計算應用端所需平均轉速 n_{2m} 及
減速機額定輸出速度 n_{2N} (公式 5)

$$n_{2m} < n_{2N}$$



6. 計算減速機輸出所受之平均徑向力 F_{2rm} (公式 6)
平均徑向力 $F_{2rm} < \text{容許徑向力 } F_{2rB}$



7. 計算減速機輸出所受之平均軸向力 F_{2am} (公式 7)
平均軸向力 $F_{2am} < \text{容許軸向力 } F_{2aB}$



8. 選擇所需的減速機精度及輸出軸型式



9. 選擇完成

S5 週期運轉之建議事項

一般的應用慣量須符合以下公式：

$$\frac{J_L}{i^2} \leq 4 \cdot J_m$$

最適當的應用慣量須符合以下公式：

$$\frac{J_L}{i^2} \cong J_m$$

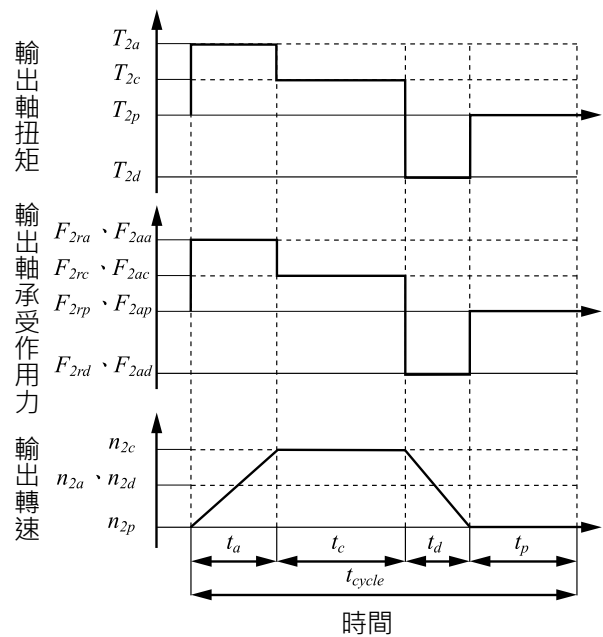
J_L 負載慣量， J_m 馬達慣量

T_{2N} ：請參考目錄「額定輸出扭矩」

F_{2rB} ：請參考目錄「容許徑向力」

公式 1. $i \cong \frac{n_m}{n_{work}}$

n_m ：馬達輸出速度， n_{work} ：實際應用速度



公式 2. $T_{2m} = \sqrt[3]{\frac{n_{2a} \cdot t_a \cdot T_{2a}^3 + n_{2c} \cdot t_c \cdot T_{2c}^3 + n_{2d} \cdot t_d \cdot T_{2d}^3}{n_{2a} \cdot t_a + n_{2c} \cdot t_c + n_{2d} \cdot t_d}}$

公式 3. $ED = \frac{t_a + t_c + t_d}{t_{cycle}}, t_{work} = t_a + t_c + t_d$
 t_a : 加速, t_c : 等速, t_d : 減速, t_p : 停止

公式 4. $T_{2max} = T_{mB} \cdot i \cdot k_s \cdot \eta$

T_{mB} : 馬達最大輸出扭矩, η : 減速機運轉效率

K_s 負載係數	
K_s	週期次數 / 小時
1.0	0 ~ 1,000
1.1	1,000 ~ 1,500
1.3	1,500 ~ 2,000
1.6	2,000 ~ 3,000
1.8	3,000 ~ 5,000

公式 5. $n_{2a} = n_{2d} = \frac{n_{2c}}{2}$
 $n_{2m} = \frac{n_{2a} \cdot t_a + n_{2c} \cdot t_c + n_{2d} \cdot t_d}{t_a + t_c + t_d}$

$$n_{2N} = \frac{n_{1N}}{i}$$

公式 6. $F_{2rm} = \sqrt[3]{\frac{n_{2a} \cdot t_a \cdot F_{2ra}^3 + n_{2c} \cdot t_c \cdot F_{2rc}^3 + n_{2d} \cdot t_d \cdot F_{2rd}^3}{n_{2a} \cdot t_a + n_{2c} \cdot t_c + n_{2d} \cdot t_d}}$

公式 7. $F_{2am} = \sqrt[3]{\frac{n_{2a} \cdot t_a \cdot F_{2aa}^3 + n_{2c} \cdot t_c \cdot F_{2ac}^3 + n_{2d} \cdot t_d \cdot F_{2ad}^3}{n_{2a} \cdot t_a + n_{2c} \cdot t_c + n_{2d} \cdot t_d}}$

1. Calculate Ratio i (Eq.1)



2. Calculate mean output torque T_{2m} (Eq.2)
Mean output torque $T_{2m} < \text{Nominal output torque } T_{2N}$



3. To determine Operation mode(S1 或 S5)
S5 : ED < 60%
S5 : $t_{\text{work}} < 20\text{min}$ (Eq.3)



4. If operation mode is(S5)
then calculate the Max. Acceleration Torque $T_{2\max}$ (Eq.4)
Max acceleration torque $T_{2\max} < \text{acceleration torque } T_{2B}$



5. Calculate the Mean Output speed n_{2m}
and the Nominal Output speed n_{2N} of Gearbox (Eq.5)
 $n_{2m} < n_{2N}$



6. Calculate the mean radial force F_{2rm} (Eq.6)
mean radial force $F_{2rm} < \text{Max. radial force } F_{2rB}$



7. Calculate the mean Axial force F_{2am} (Eq.7)
mean axial force $F_{2am} < \text{Max. axial force } F_{2aB}$



8. Select the Required Backlash and Shaft Option



9. Order your LIMING Gearbox

Recommended (for S5 Cyclic Operation)

The general design is given for

$$\frac{J_L}{i^2} \leq 4 \cdot J_m$$

The optimal design is given for

$$\frac{J_L}{i^2} \cong J_m$$

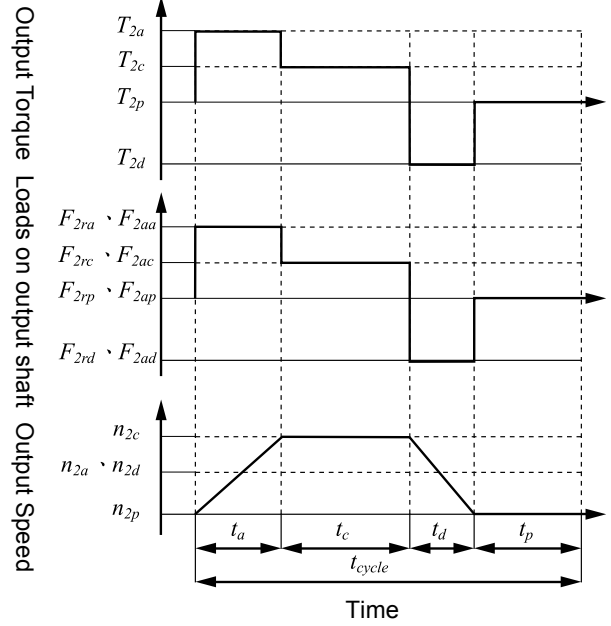
Where J_L is Load Inertia and J_m is Motor Inertia.

T_{2N} please reference catalog 「Rated Output Torque」

F_{2rB} please reference catalog 「Max. Radial Force」

$$\text{Eq.1} \quad i \cong \frac{n_m}{n_{\text{work}}}$$

n_m is output speed of the motor, n_{work} is working speed



$$\text{Eq.2} \quad T_{2m} = \sqrt[3]{\frac{n_{2a} \cdot t_a \cdot T_{2a}^3 + n_{2c} \cdot t_c \cdot T_{2c}^3 + n_{2d} \cdot t_d \cdot T_{2d}^3}{n_{2a} \cdot t_a + n_{2c} \cdot t_c + n_{2d} \cdot t_d}}$$

$$\text{Eq.3} \quad ED = \frac{t_a + t_c + t_d}{t_{\text{cycle}}}, t_{\text{work}} = t_a + t_c + t_d$$

t_a is the time for acceleration, t_c is constant travel,

t_d is the time for deceleration and t_p is the time for pause.

$$\text{Eq.4} \quad T_{2\max} = T_{mB} \cdot i \cdot k_s \cdot \eta$$

T_{mB} is the Max. output torque of the motor and η is the efficiency of the gearbox

K_s service factor

K_s	No. of Cycles / hr
1.0	0 ~ 1,000
1.1	1,000 ~ 1,500
1.3	1,500 ~ 2,000
1.6	2,000 ~ 3,000
1.8	3,000 ~ 5,000

$$\text{Eq.5} \quad n_{2a} = n_{2d} = \frac{n_{2c}}{2}$$

$$n_{2m} = \frac{n_{2a} \cdot t_a + n_{2c} \cdot t_c + n_{2d} \cdot t_d}{t_a + t_c + t_d}$$

$$n_{2N} = \frac{n_{1N}}{i}$$

$$\text{Eq.6} \quad F_{2rm} = \sqrt[3]{\frac{n_{2a} \cdot t_a \cdot F_{2ra}^3 + n_{2c} \cdot t_c \cdot F_{2rc}^3 + n_{2d} \cdot t_d \cdot F_{2rd}^3}{n_{2a} \cdot t_a + n_{2c} \cdot t_c + n_{2d} \cdot t_d}}$$

$$\text{Eq.7} \quad F_{2am} = \sqrt[3]{\frac{n_{2a} \cdot t_a \cdot F_{2aa}^3 + n_{2c} \cdot t_c \cdot F_{2ac}^3 + n_{2d} \cdot t_d \cdot F_{2ad}^3}{n_{2a} \cdot t_a + n_{2c} \cdot t_c + n_{2d} \cdot t_d}}$$

Installation & Critical Applications

安裝與操作限制

操作限制

如果須使用其它的安裝方式或者特殊的輸入轉數時，請與本公司連絡。
此外，當使用者遇到下面所列的任何情況時也必須跟原廠技術人員聯繫：

- 使用條件超出額定轉速時。
- 使用條件超出額定扭矩時。
- 當減速機出現故障時有可能導致使用者受傷的情況時。
- 將安裝於旋轉慣性特別大的設備上時。
- 將用於起重的捲揚機上 (需要逆止特性) 時。
- 當減速機外殼會承受高度動態的負載時。
- 當工作環境超過攝氏 -25 度到 +45 度的範圍內時。
- 將安裝於有腐蝕性化學品的環境中。
- 將安裝在鹽份濕度較高的環境中。
- 輻射性高的環境中。
- 安裝於氣壓異於正常大氣壓力的環境中。

避免把減速機 (整臺或部分) 浸在水裡或其它液體中。

實際使用時的最高負載扭矩 (*) 絕對不能超過性能表上的額定扭矩的三倍。

(*) 所述的參數是指能承受瞬間短暫的過載，這種情況常出現在滿載啟動，剎車，震動或其它動態操作環境中。

Critical applications

For other mounting positions and/or particular input speeds, please contact our technical person.

It is also necessary to take due consideration of and carefully assess the following applications by calling our Technical Service:

- The maximum input speed exceeds nominal input speed.
- The maximum output torque exceeds rated output torque.
- Use in services that could be hazardous for people if the reduction unit fails.
- Applications with especially high inertia.
- Use as a lifting winch.
- Applications with high dynamic strain on the case of the reduction unit.
- Ambient temperature under -25° C or over 45° C.
- Use in chemically aggressive environments.
- Use in a salty environment.
- Use in radioactive environments.
- Use in environments pressures other than atmospheric pressure.

Avoid applications where even partial immersion of the reduction unit is required.

The maximum torque (*) that the gear reducer can support must not exceed three times the nominal torque .

(*) intended for momentary overloads due to starting at full load, braking, shocks or other causes, particularly those that are dynamic.

Installation & Critical Applications

安裝與操作限制

安裝注意事項

當安裝減速機時，請注意下列的事項：

- 減速機安裝到機器上之前，必須再次確認減速機的輸出軸旋轉方向是否正確。
- 減速機必須牢固地安裝在機器上，避免有任何鬆動或振動的情況。
- 安裝時，確保所有螺絲和連接件已經牢固地預緊，避免因震動或摩擦造成螺絲鬆動。
- 避免將減速機置於高溫高濕或極端惡劣的環境中。若無法避免，請盡可能為減速機提供防護措施，以延長其使用壽命。

Installation

To install the reducer unit, it is necessary to note the following recommendations:

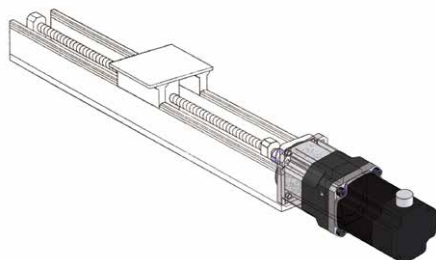
- Check the correct direction of rotation of the reducer unit output shaft before fitting the unit to the machine.
- The mounting on the machine must be stable to avoid any vibration.
- Make sure that all bolts and fasteners are properly preloaded to prevent loosening due to vibration or friction.
- Whenever possible, protect the reducer unit from high temperatures, high humidity, and adverse weather conditions.

Applications

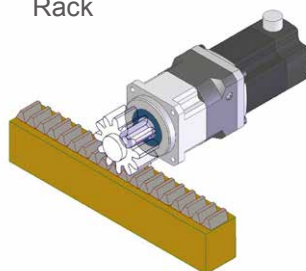
減速機應用範例

○ 線性動作機構 Linear Action

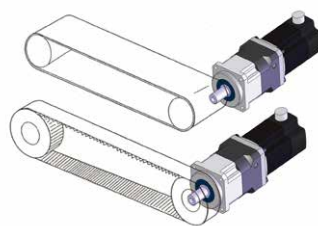
- 滾珠螺桿傳動
Ball Screw



- 齒條傳動
Rack

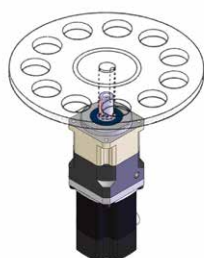


- 滾輪 / 滾筒 / 皮帶
Roller / Belt

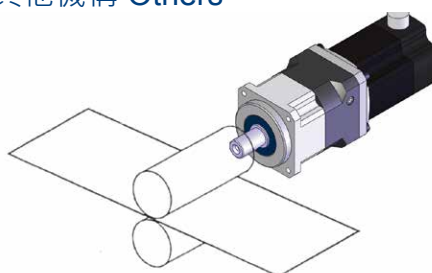


○ 回轉盤機構 Rotary Action

- 分度盤
Index



○ 其他機構 Others



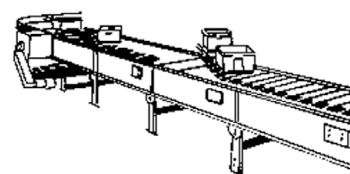
- 機器手臂
Robot



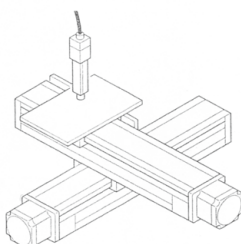
- 印刷機
Printing Machine



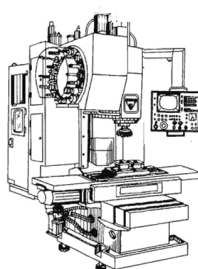
- 輸送機
Conveyor



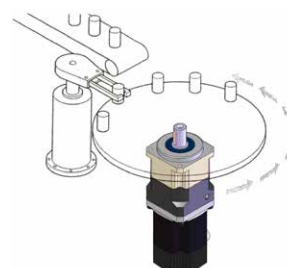
- 工作台
Working Table



- CNC 主軸
CNC Spindle



- 分割器
Index

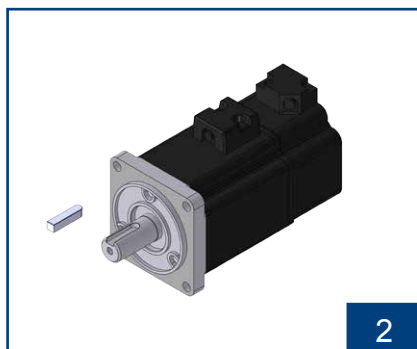


Planetary Gearbox and Motor Mounting Instructions

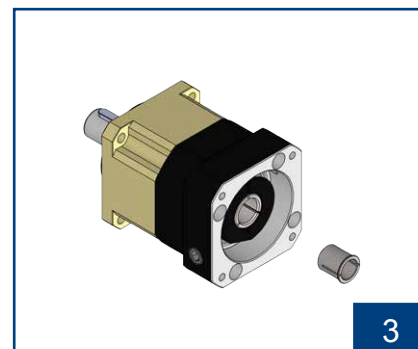
行星減速機與馬達安裝指南



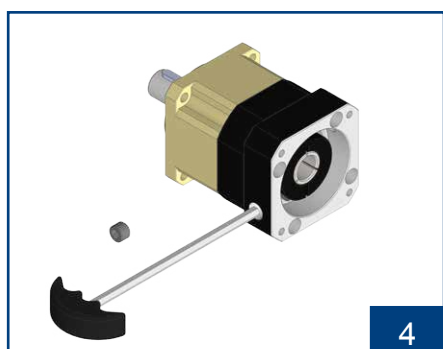
核對馬達型號與減速機規格是否正確。並將配合面擦拭乾淨。
Confirm the motor, and gearbox size. Clean up the mounting surface.



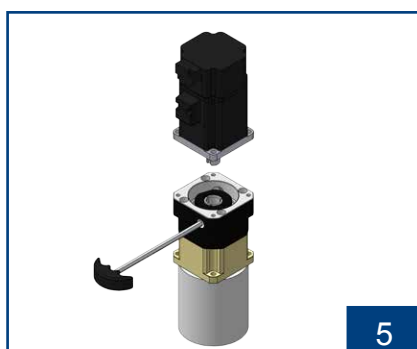
確認減速機與馬達是否有鍵配合。
Confirm whether the reducer and motor are keyed together.



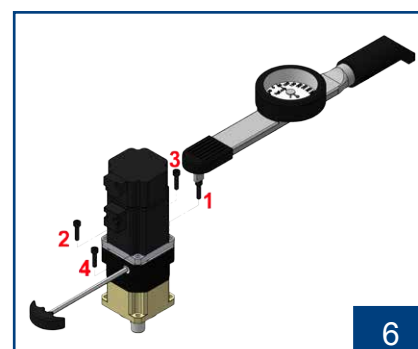
檢查馬達出力軸尺寸，如需軸套，請先裝進減速機入力孔內。
Check motor shaft size and insert bushing into input bore of the gear box if necessary.



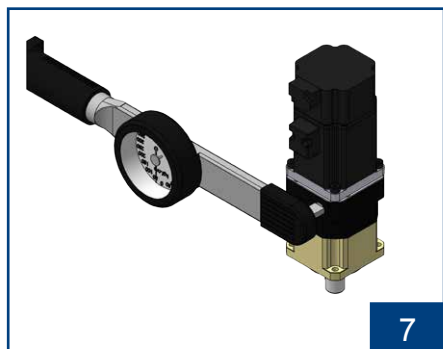
取出塞頭，使用六角扳手將迫緊環螺絲鬆開。並將扳手與螺絲對準孔位。
Remove the plug on the adapter plate. Rotate the set collar till the bolt is line up.



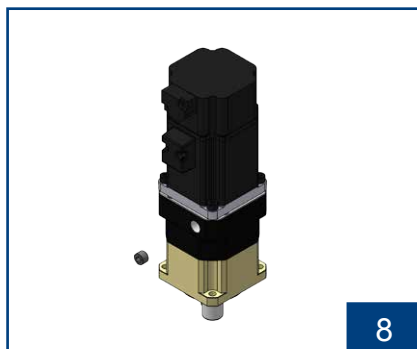
將馬達垂直裝入減速機。
Put the motor into the gearbox vertically.



依序 1~4 使用扭力扳手鎖上內六角螺絲。
Tighten the mounting bolt in 1~4 order with torque wrench.



使用扭力扳手將迫緊環螺絲鎖緊。
Tighten the set collar bolt with torque wrench.



裝回塞頭並鎖緊。
Tighten back the screw plug.

1. 務必先鎖緊馬達固定面，才能鎖緊馬達軸心迫緊環。
Please be sure to tighten motor flange on gear box flange first and then to tighten the set collar on motor shaft.
2. 請依步驟順序組裝，尤其步驟 6、7 不可顛倒。
Please assembly in order according to above steps, especially for step 6 and step 7.
3. 安裝完畢後，請將塞頭回塞，避免細小物品掉入減速機中。
Please noted that tighten back the screw plug to protect the gear box.

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利明牌減速機系列產品

伺服用減速機 Reducers for Servo Motor

高精度行星減速機 High Precision Planetary Reducers



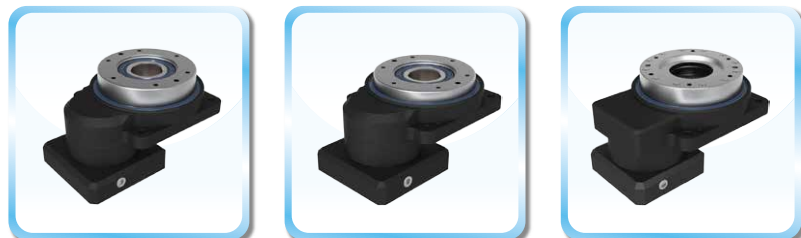
直交軸伺服用減速機

High Precision Right Angle Reducers



伺服用中空旋轉平台減速機

Hollow Rotary Actuator Reducers



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利明牌減速機系列產品

一般傳動減速機 General Speed Reducers

齒輪減速機 Gear Reducers



蝸輪減速機 Worm Gear Reducers



一般傳動減速機 Reducers



傳動軸用減速機 Gearbox for Power Transmission



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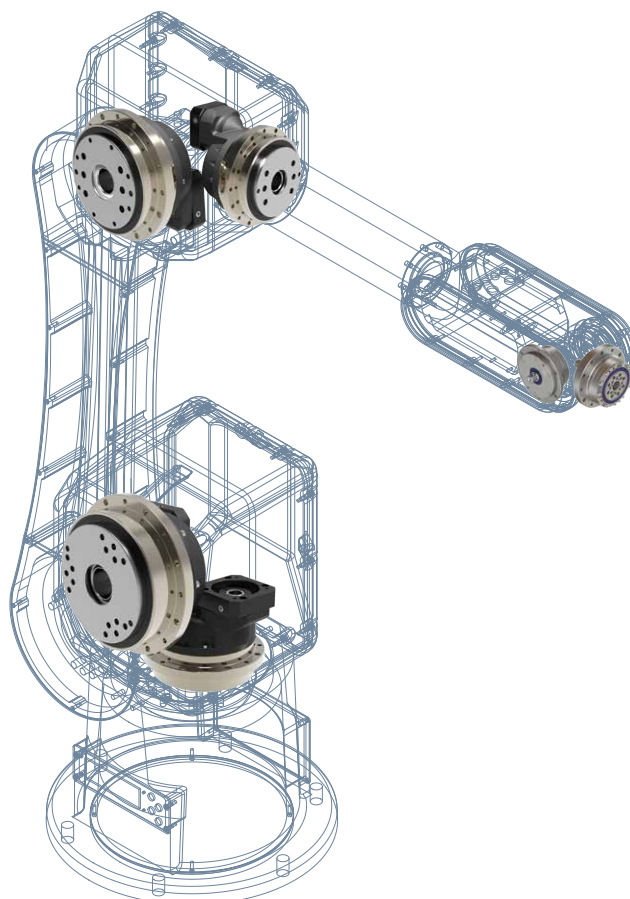
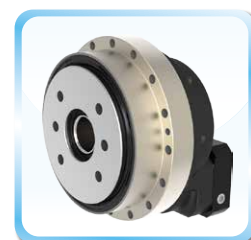
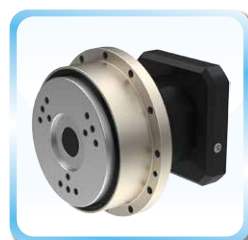
利明牌減速機系列產品

機械手臂減速機 Robot Reducers

諧波減速機 ROBONICDRIVE



高精度擺線減速機 CYKODRIVE



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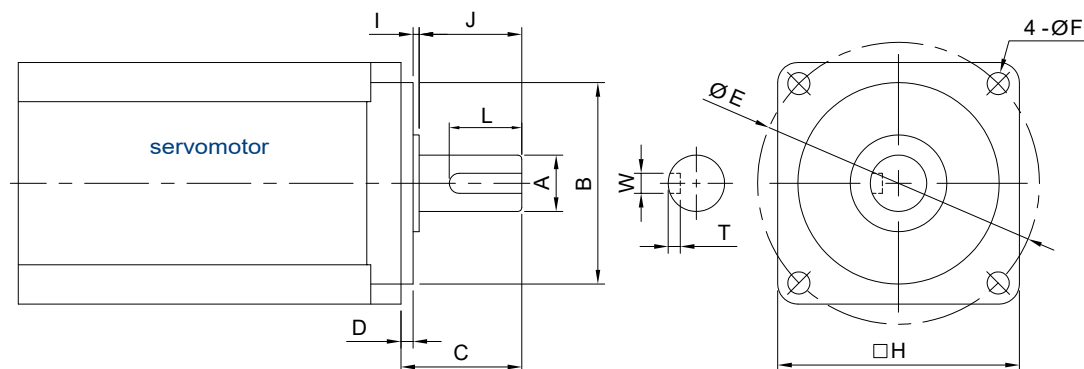
利明牌減速機系列產品

小型齒輪減速機 Small Gear Reducers



Inquiry Information

顧客詢問資料



A	B	C	D	E	F	H	I	J	L	W	T

減速機訂購編號 Reducer Ordering Number

		—			—		
減速機型 Type	型號 Model		速比 Ratio	輸出軸鍵槽 Output Shaft Keyway	輸入軸鍵槽 Input Shaft Keyway		背隙等級 Backlash Class
							馬達型號 MOTOR NO.

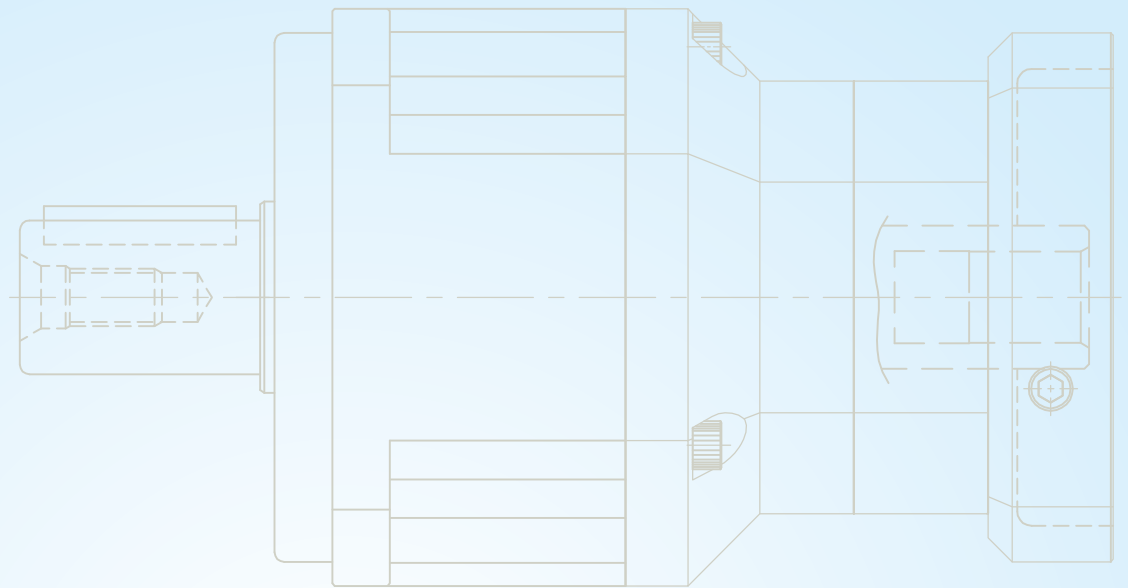
訂貨須知：

- ◆機種、型號、馬力
- ◆減速比或每分鐘回轉數
- ◆荷重狀況及聯結方式
- ◆數量及被安裝的機械名稱
- ◆入力方式和入力轉速
- ◆馬達廠牌型號或法蘭及馬達軸尺寸

General Notices:

- ◆ Type, model and horsepower
- ◆ Speed ratio or R.P.M of output shaft
- ◆ Method of connection and loading
- ◆ Quantity and applied mechanism
- ◆ Input connection method and input speed
- ◆ Motor band Model no or frame & motor shaft dimension

公司名稱 Company Name		聯絡人 Contact Person	
地址 Address			
電話 Tel	傳真 Fax	電子信箱 E-Mail	
備註 Notes			

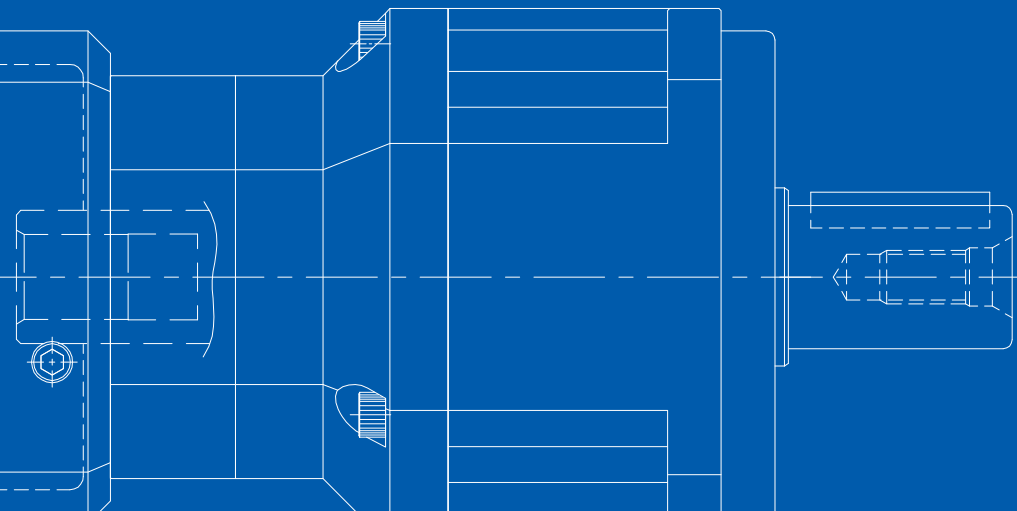


2025年6月版

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June , 2025

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