

蝸輪蝸桿減速機

SERVO WORM GEARBOX



公司簡介

原億昌機械有將近四十年的生產經驗，且擁有 ISO 9001 認證，與經濟部工研院產學合作，因應目前全球智能製造的趨勢，提供傳動系列零配件與設備，包含齒條（排齒）、導軌齒條、齒輪、滾輪、行星減速機、蝸輪蝸桿減速機和消除減速機等產品。

廣大客群包含各行業領域，例如：CNC 機台、工具母機、木工機、印刷機、切割機、龍門銑床、磨床、鑽床、彎管機、機器人手臂、自動化倉儲設備、自動上下料軌道、沙灘車、汽車、航空母艦、半導體設備廠、起重機等。

原億昌產品優良，於 2015 年榮獲台灣第 12 屆國家品牌玉山獎，傑出企業類；2016 年極度精密齒條齒輪組，榮獲第十三屆國家品牌玉山獎最佳產品獎，與金炬獎十大績優商品獎。

原億昌以自有品牌 YYC 行銷市場，“You drive, You Control! 你驅動，你掌控！”為企業標語，目標是客戶所使用的驅動零件品質卓越，效能皆在客戶的掌控之中，將產品定位於中高端市場，已經行銷近五十個國家，提供更多客戶滿意，是我們持續努力的目標。

COMPANY PROFILE

Yuan Yi Chang Machinery has 40 years of experience, with ISO 9001 certificate and work projects with Industrial Technology Research Institute. In response to smart manufacturing trend globally, YYC offers different series of transmission parts and equipment including Rack, Guideway Rack, Pinion, Roller, Planetary Reducer, Servo Worm Gearbox, Backlash Free Reducer.

Our major clients include all kinds of industries and fields such as CNC machines, machine centers, wood-cutting machines, printing machines, cutting machines, gantry milling machines, grinding machines, drilling machines, bending machines, robotic arms, automatic storage equipment, automatic upload & unload track, ATV, aircraft carrier, semiconductor plant, cranes, including 7th axis application in Industry 4.0, and so on.

YYC products have excellent quality. In 2015, we earned Best Enterprise of National Brand Yu-Shan Award. In 2016, our Ultra High Precision Rack and Pinion won Best Products of National Brand Yu-Shan Award and Golden Torch Prize.

Yuan Yi Chang has marketed by brand name “YYC” which means “You drive, You Control!” Every driven part with outstanding quality, so the performance is under customer’s control. Products are target on middle to high end markets. Currently, we are exporting nearly 50 countries. To have more customers’ satisfactions is our continuous goal.



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優勢

Advantage

免維護

- * 加裝高性能全合成潤滑油
- * 全封閉結構，無需更換潤滑油

Maintenance Free

- * High performance synthetic lubricant
- * Sealed structure, lubrication replacement is not necessary

優化蝸輪蝸桿嚙合係數

- * 正確的嚙合，可降低運轉時的耗損

Optimize Worm Gear Meshing Coefficient

- * Correct meshing reduces wear during operation

優化的調整結構

- * 快速調整結構設計
- * 快速設定間隙
- * 專利結構

Optimized Adjustment Structure

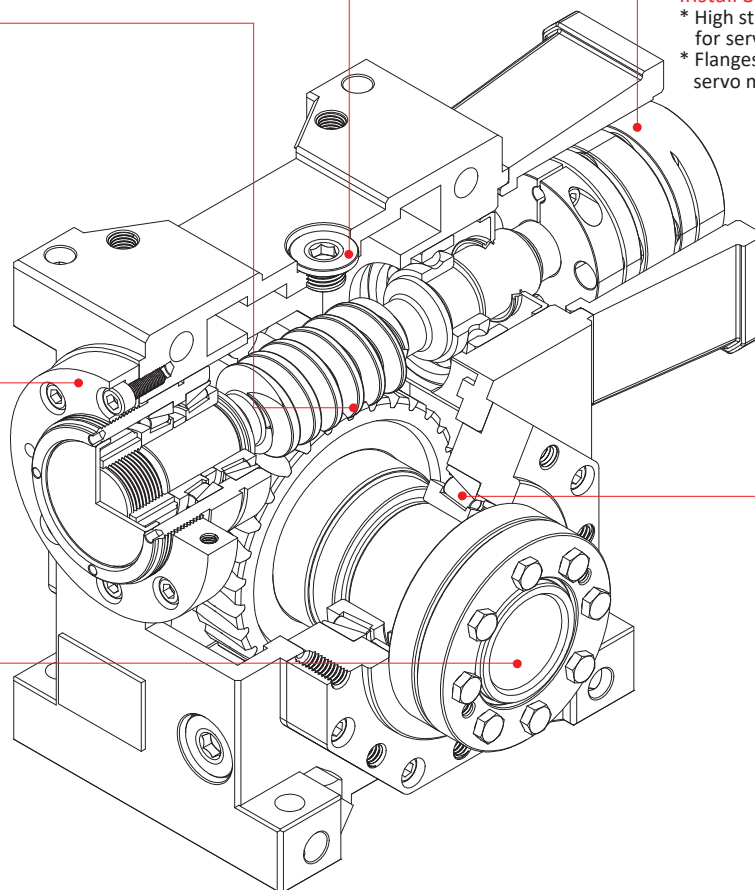
- * Designed for adjusting the structure quickly.
- * Quickly backlash setting
- * Patented design

快速安裝伺服電機

- * 伺服電機專用高剛性、低慣量聯軸器
- * 可提供各種和伺服電機相配的法蘭

Install Servo Motor Quickly

- * High stiffness and low inertia coupling for servo motors
- * Flanges are available for different servo motors



兩種輸出背隙

- * 超精密級：1 弧分，適用高精度機台
- * 精密級：2~4 弧分，泛用型機種

2 Options of Backlash

- * Ultra Precision: 1 arcmin for high demanding applications
- * Precision: 2 to 4 arcmin for all-purpose applications

蝸輪使用加大圓錐滾子軸承

- * 能承受很大的軸向負荷
- * 軸承預緊安裝，具有更高的支撐剛性

Worm Gear upgraded to Taper Roller Bearings

- * High axial load
- * Bearing pre-loaded, with higher support stiffness

特點

Features

蝸輪蝸桿減速機有 45、50、55、63、75、90 六種規格，採用雙導程蝸桿傳動。蝸桿的左右齒面使用不同的導程角，引起齒厚的漸變，這樣就可以移動蝸桿調整嚙合間隙。

SWG Series is available in 6 sizes: 45, 50, 55, 63, 75, 90 with dual lead worm drive. Left and right flanks of worm shaft using different lead angle, causing tooth thickness gradual change, so that you can move worm shaft and adjust backlash.

特點：

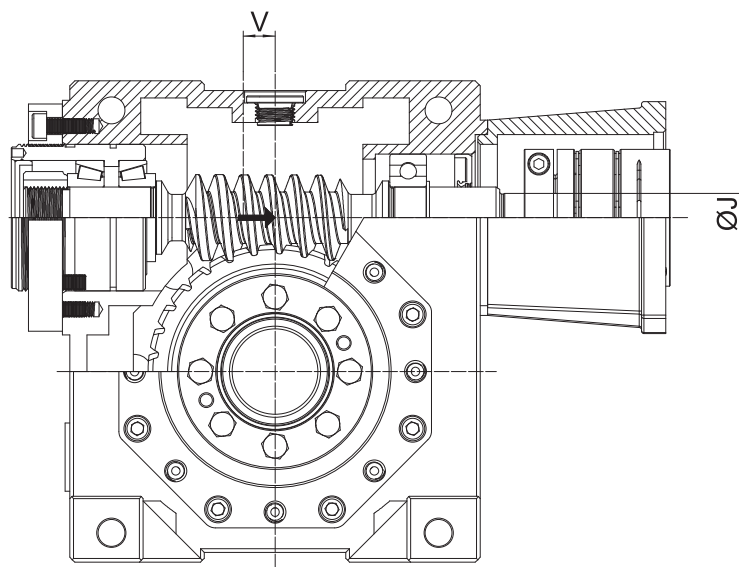
- 蝸輪回轉背隙可以調整到小於 1 弧分。
- 減速機使用一段時間後可以重新調整間隙。
- 輸入用聯軸器聯結：可靠、無背隙。
- 輸出用錐形鎖緊環聯軸器：可靠、無背隙。

Features:

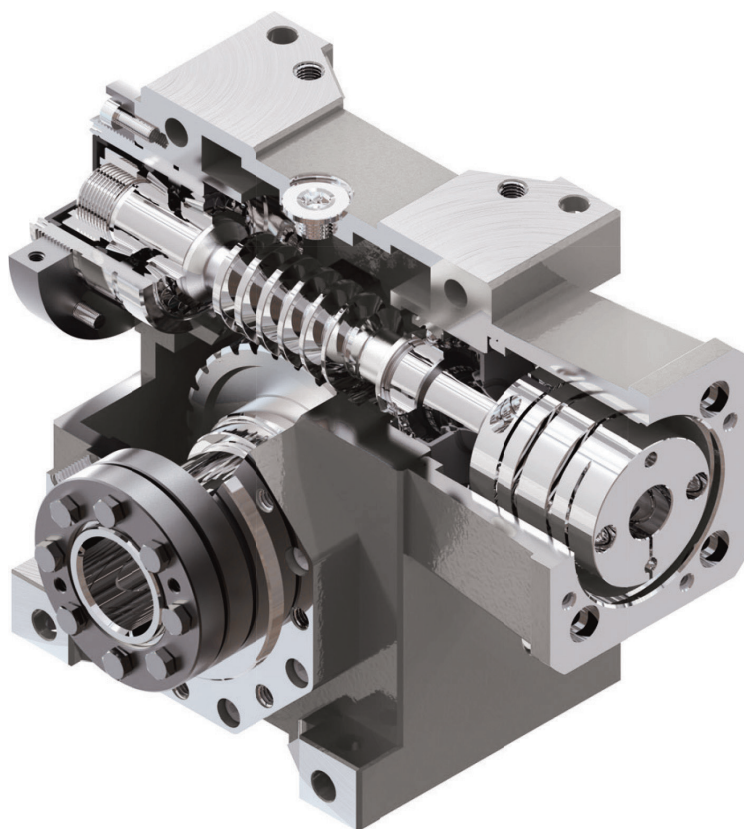
- Worm gear gyration backlash can be adjusted to less than 1 arcmin.
- Reducer can be re-adjusted the gap after using.
- Input with coupling : reliable without backlash.
- Output using conical clamping ring couplings : reliable without backlash.

間隙調整

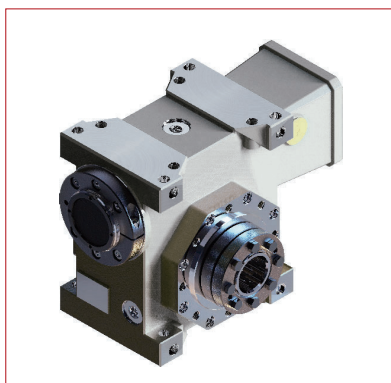
Clearance Adjustment



SWG	調整距離 Adjust the distance	調整量係數 Adjustment coefficient	間隙調整量 Clearance adjustment	輸入軸直徑 Input shaft diameter
	V (mm)	K (mm ⁻¹)	Δ S _a (mm)	J (mm)
045	8	0.015-0.04	0.12-0.32	15
050	8	0.015-0.03	0.12-0.24	15
055	8	0.015-0.05	0.12-0.40	18
063	10	0.025-0.05	0.25-0.50	20
075	13	0.020-0.06	0.26-0.78	24
090	13	0.025-0.06	0.33-0.78	28



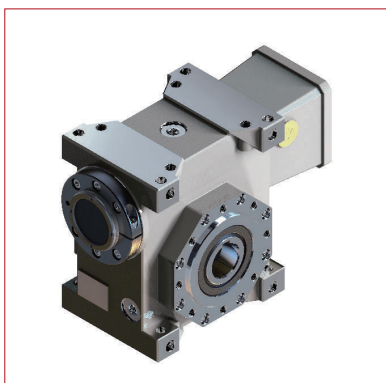
迫緊環
Hollow Shaft for Shrink Disc



具有迫緊環的中空軸輸出，精度高、容易整合。

Hollow shaft output for shrink disc:
High precision and easy to integrate with applications.

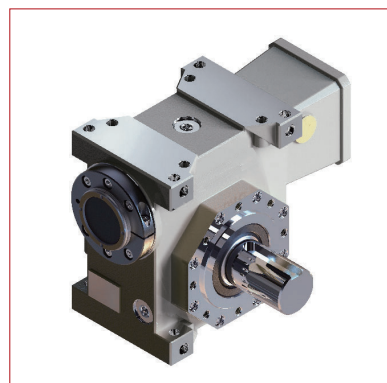
中空軸 (有鍵槽)
Hollow Shaft with Keyway



帶有鍵槽的中空軸輸出，安裝方便、容易整合。

Hollow shaft output with keyway:
Easy to install and integrate with applications.

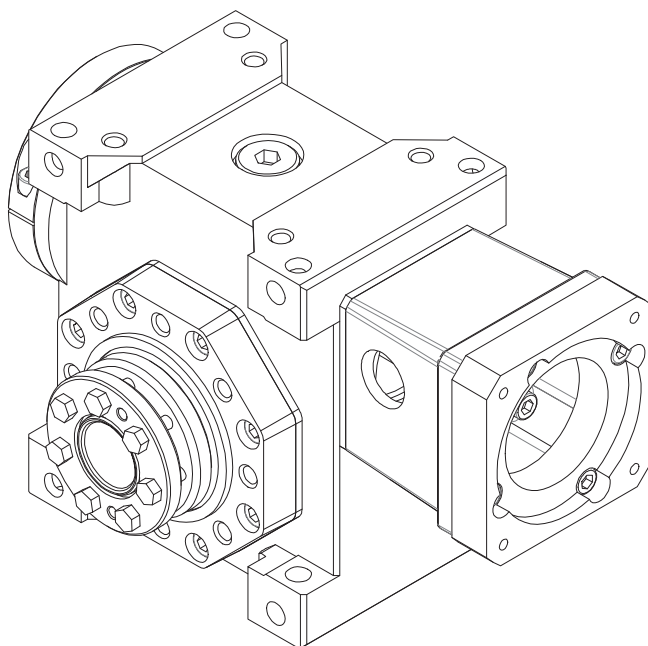
實心軸
Solid Shaft



實心軸輸出 (單、雙出軸)，剛性強、傳統方式。

Solid shaft (single and double output):
A traditional solution with high stiffness.

SWG045



P₀ 超精密級 2 弧分
P₁ 精密級 3~5 弧分

P₀ Ultra precision 2 arcmin
P₁ Precision 3~5 arcmin

嚙合參數

Mesh Data

SWG	i	14.5	19.5	30	45	60	90
045	Z ₁	2	2	1	1	1	1
	Y	14°06'	11°33'	7°10'	5°22'	4°14'	3°01'
	M _x	2.35	1.80	2.35	1.62	1.22	0.83
	η _d	0.80	0.77	0.69	0.63	0.57	0.48
	η _s	0.58	0.53	0.44	0.38	0.32	0.26

蝸桿螺旋線、蝸輪齒牙和效率 (n₁=1400)

Worm thread, wheel tooth and efficiency data (n₁=1400)

性能參數

Performance

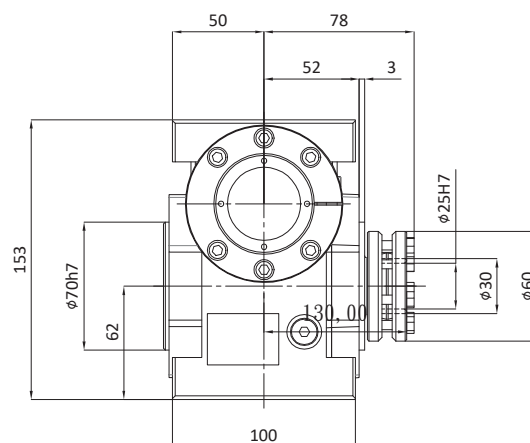
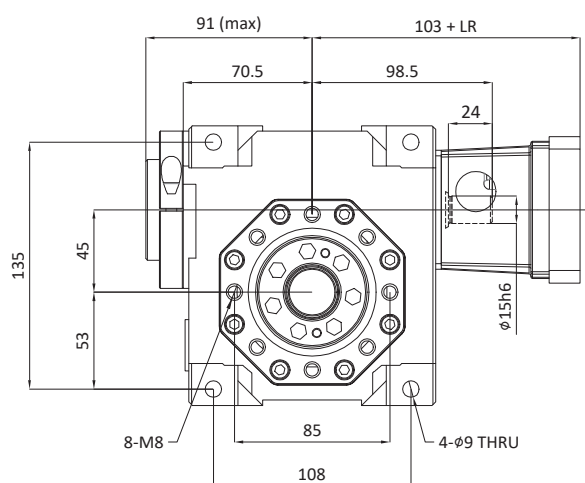
n ₁		3000				1400				900					
SWG	i	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	Fr ₂ [N]	Fa ₂ [N]
045	14.5	0.85	1.1	44	206.9	0.80	0.6	52	96.6	0.74	0.5	58	62.1	5500	3800
	19.5	0.82	0.9	46	153.8	0.77	0.5	54	71.8	0.71	0.4	60	46.2	5500	3800
	30	0.74	0.7	52	100.0	0.69	0.4	61	46.7	0.63	0.3	67	30.0	5500	3800
	45	0.68	0.6	50	67.0	0.63	0.3	58	31.1	0.57	0.3	63	20.0	5500	3800
	60	0.62	0.4	49	50.0	0.57	0.2	57	23.3	0.51	0.2	62	15.0	5500	3800
	90	0.53	0.4	48	33.3	0.48	0.2	56	15.6	0.42	0.2	60	10.0	5500	3800

參數符號對應表請參考 P.34

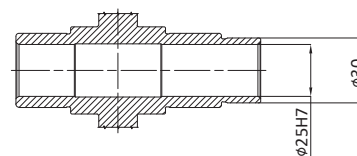
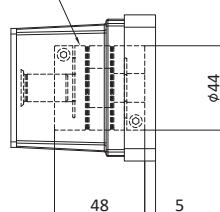
Please refer to P.34 of Symbol Table and Descriptions.

迫緊環尺寸圖

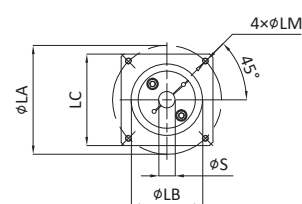
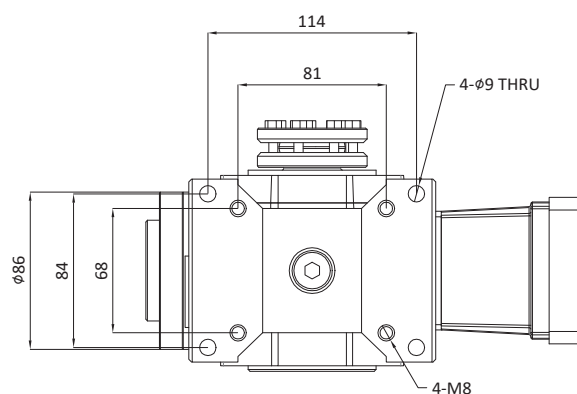
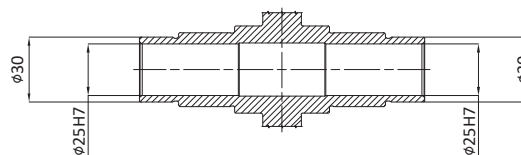
Shrink Disc Dimension Charts



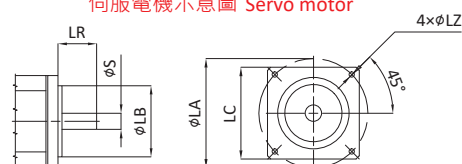
迫緊環孔輸出 Hollow shaft for shrink disc

伺服聯軸器
Servo Coupling

雙迫緊環孔輸出 Hollow shaft for double shrink disc



伺服電機示意圖 Servo motor



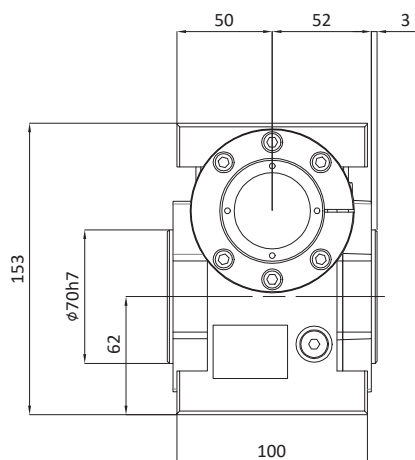
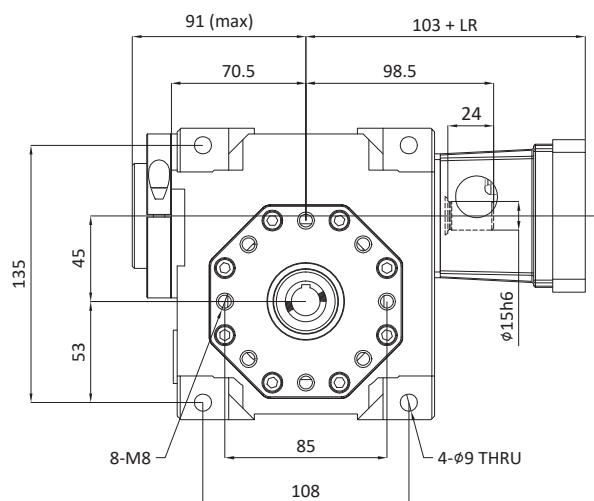
LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

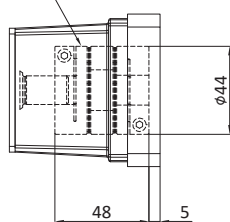
LA / LB / LC / LM / LR / S : By servo motor

中空軸 (有鍵槽) 尺寸圖

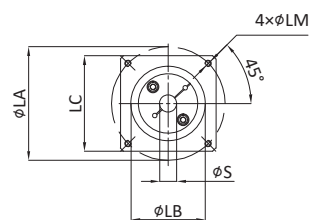
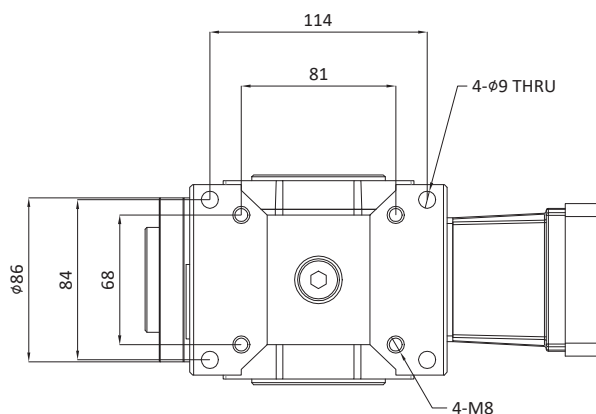
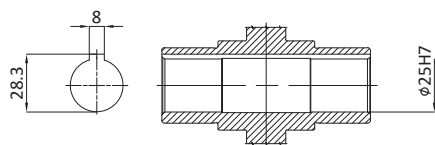
Hollow Shaft with Keyway Dimension Charts



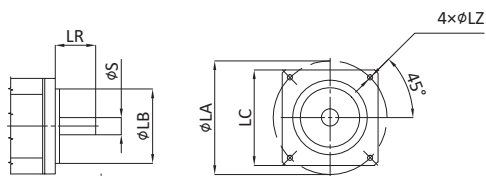
伺服聯軸器
Servo Coupling



中空軸(有鍵槽)孔輸出 Hollow shaft with keyway



伺服電機示意圖 Servo motor

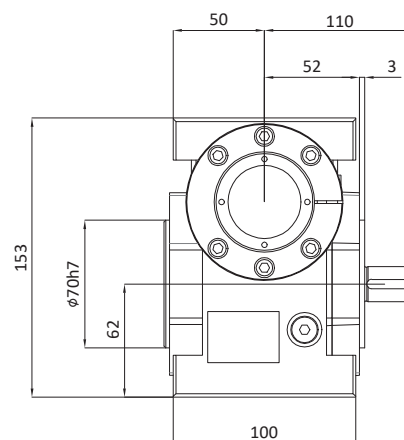
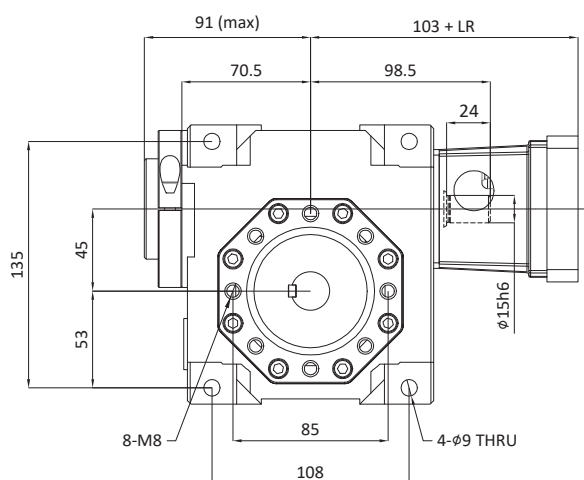


LA / LB / LC / LM / LR / S : 按伺服電機定之

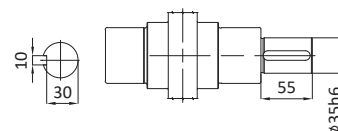
單位 / Dimension : mm
LA / LB / LC / LM / LR / S : By servo motor

實心軸尺寸圖

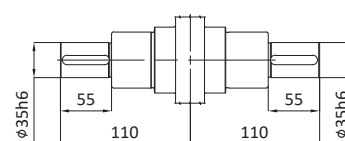
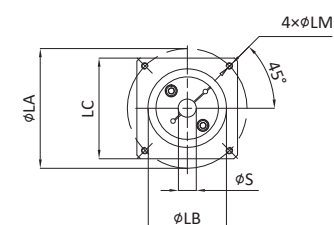
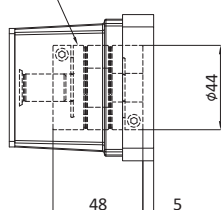
Solid Shaft Dimension Charts



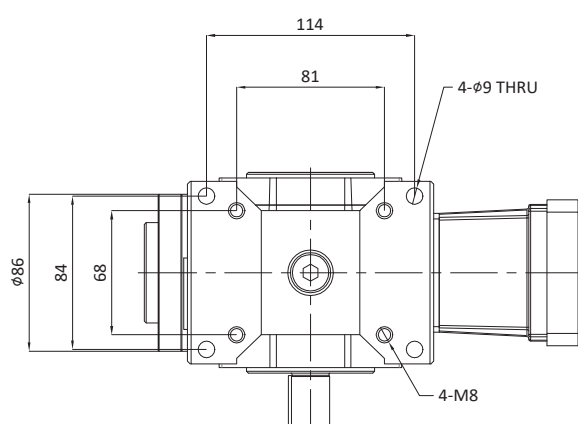
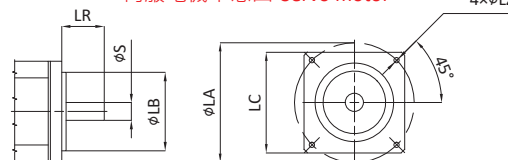
單輸出軸 Single solid shaft



雙輸出軸 Double solid shaft

伺服聯軸器
Servo Coupling

伺服電機示意圖 Servo motor

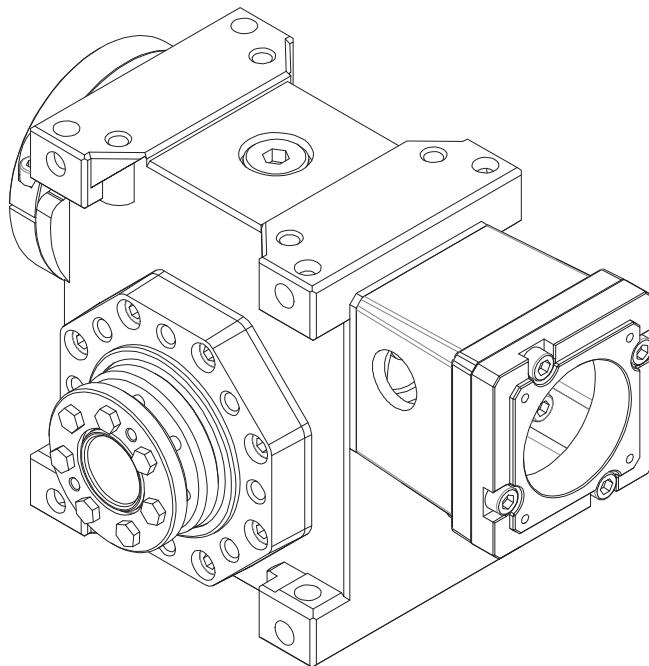


LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

LA / LB / LC / LM / LR / S : By servo motor

SWG050



P₀ 超精密級 2 弧分
P₁ 精密級 3~5 弧分

P₀ Ultra precision 2 arcmin
P₁ Precision 3~5 arcmin

嚙合參數

Mesh Data

SWG	i	14.5	19.5	30	60
050	Z ₁	2	2	1	1
	Y	11°18'	9°04'	5°42'	3°17'
	M _x	2.50	1.90	2.50	1.30
	η _d	0.80	0.77	0.70	0.57
	η _s	0.58	0.54	0.44	0.32

蝸桿螺旋線、蝸輪齒牙和效率 (n₁=1400)

Worm thread, wheel tooth and efficiency data (n₁=1400)

性能參數

Performance

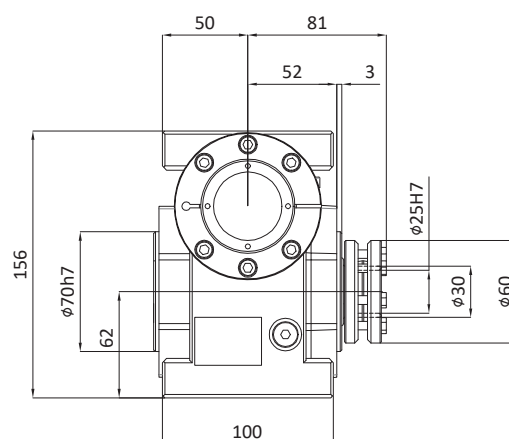
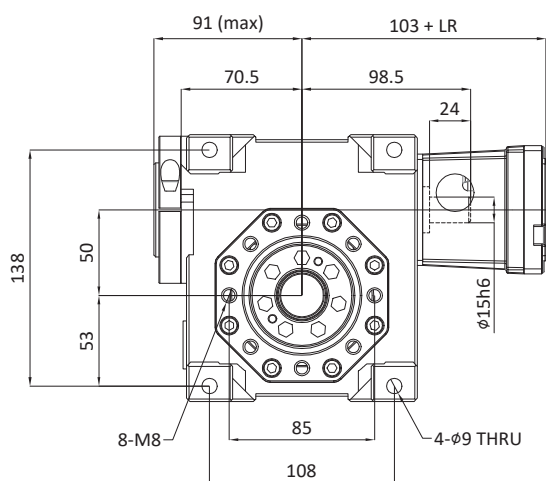
n ₁		3000				1400				900					
SWG	i	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	Fr ₂ [N]	Fa ₂ [N]
050	14.5	0.85	1.4	57	206.9	0.80	0.9	74	96.6	0.74	0.7	84	62.1	5500	3800
	19.5	0.82	1.0	53	153.8	0.77	0.7	73	71.8	0.71	0.5	77	46.2	5500	3800
	30	0.75	0.9	64	100.0	0.70	0.6	84	46.7	0.64	0.4	90	30.0	5500	3800
	60	0.62	0.4	50	50.0	0.57	0.3	68	23.3	0.51	0.2	72	15.0	5500	3800

參數符號對應表請參考 P.34

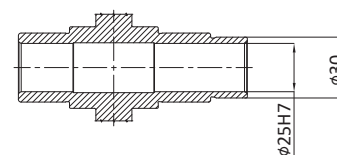
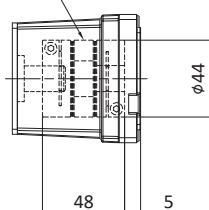
Please refer to P.34 of Symbol Table and Descriptions.

迫緊環尺寸圖

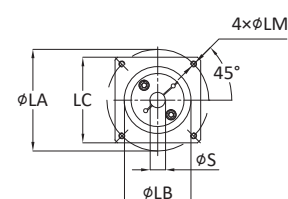
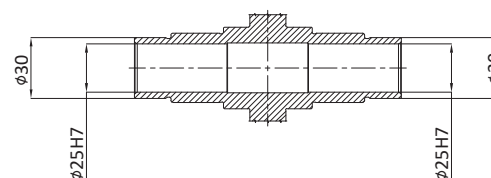
Shrink Disc Dimension Charts



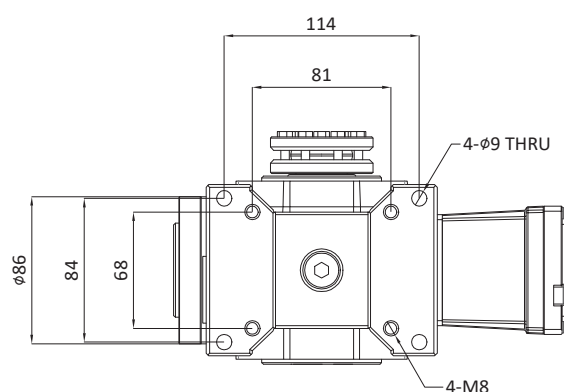
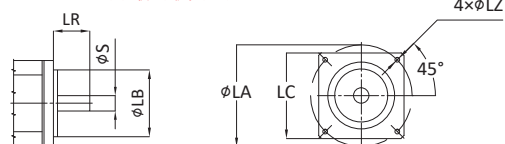
迫緊環孔輸出 Hollow shaft for shrink disc

伺服聯軸器
Servo Coupling

雙迫緊環孔輸出 Hollow shaft for double shrink disc



伺服電機示意圖 Servo motor



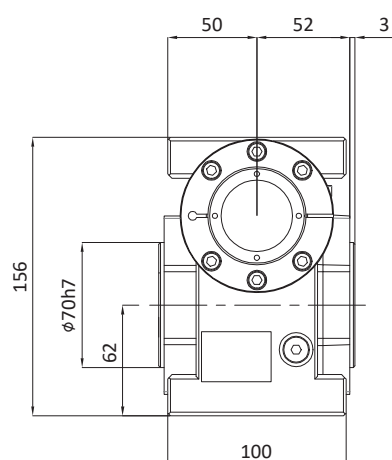
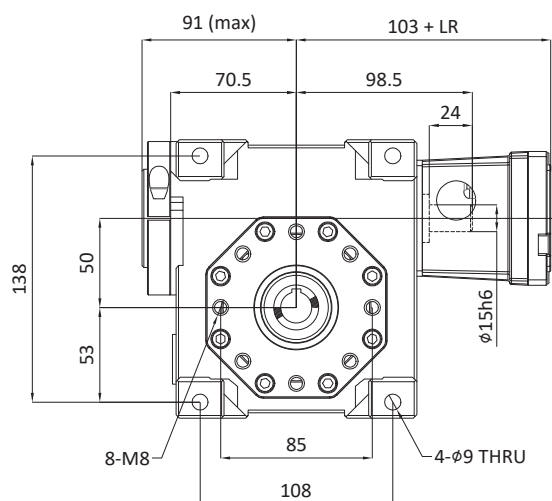
LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

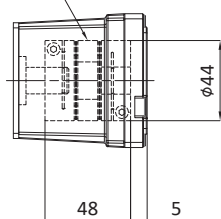
LA / LB / LC / LM / LR / S : By servo motor

中空軸 (有鍵槽) 尺寸圖

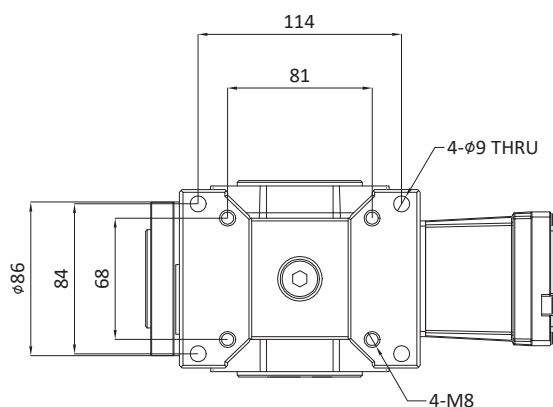
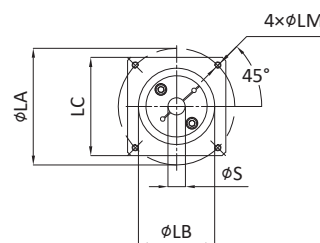
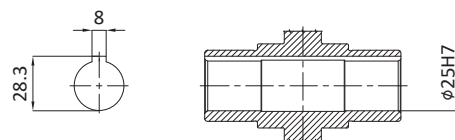
Hollow Shaft with Keyway Dimension Charts



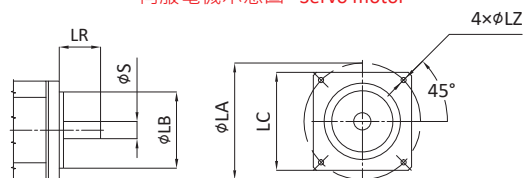
伺服聯軸器
Servo Coupling



中空軸(有鍵槽)孔輸出 Hollow shaft with keyway



伺服電機示意圖 Servo motor

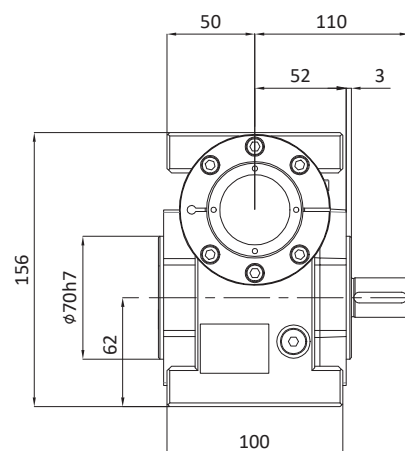
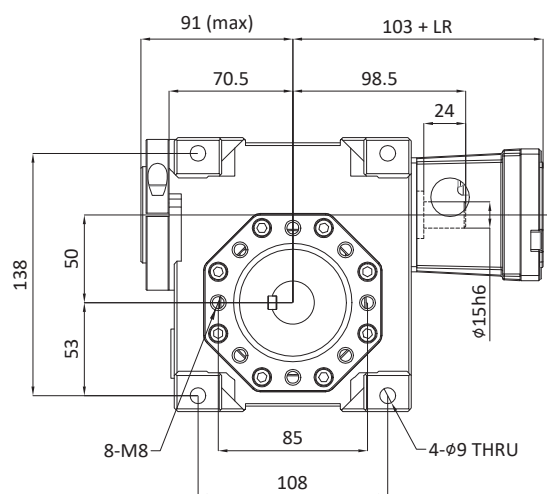


LA / LB / LC / LM / LR / S : 按伺服電機定之

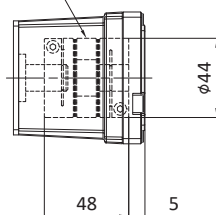
單位 / Dimension : mm
LA / LB / LC / LM / LR / S : By servo motor

實心軸尺寸圖

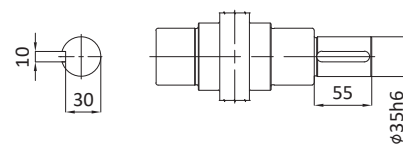
Solid Shaft Dimension Charts



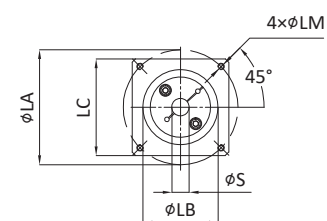
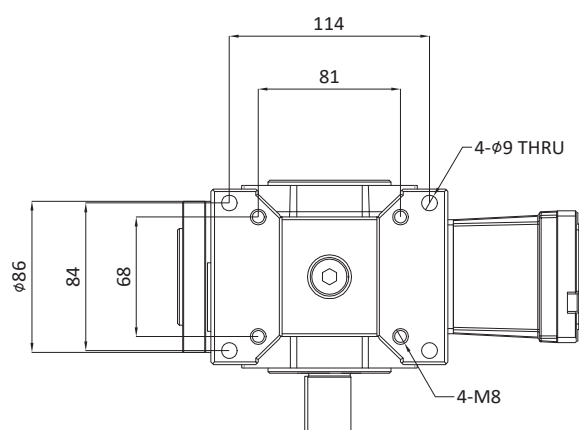
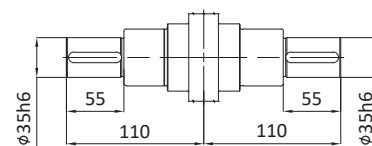
伺服聯軸器
Servo Coupling



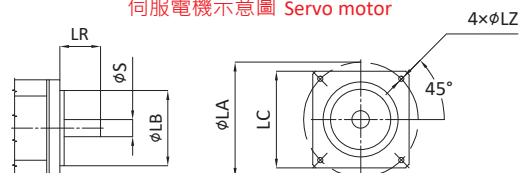
單輸出軸 Single solid shaft



雙輸出軸 Double solid shaft



伺服電機示意圖 Servo motor

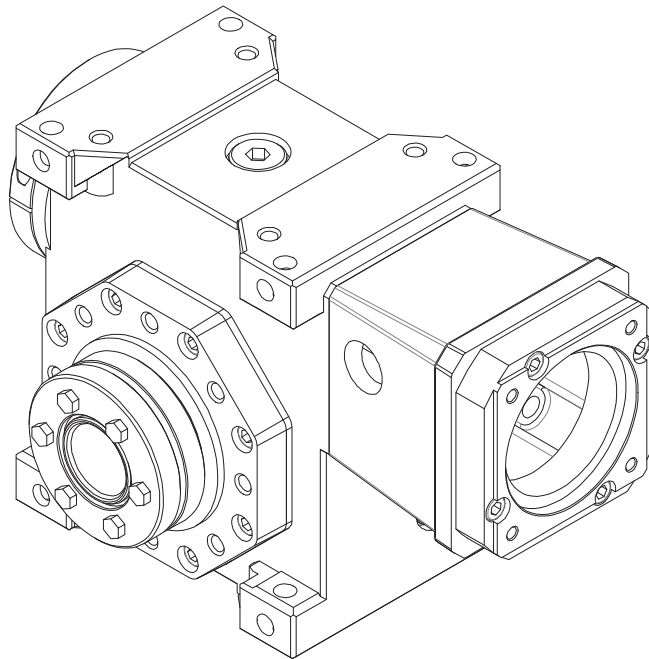


LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

LA / LB / LC / LM / LR / S : By servo motor

SWG055



P₀ 超精密級 2 弧分
P₁ 精密級 3~5 弧分

P₀ Ultra precision 2 arcmin
P₁ Precision 3~5 arcmin

嚙合參數

Mesh Data

SWG	i	14.5	19.5	30	45	60	90
055	Z ₁	2	2	1	1	1	1
	Y	12°20'	10°02'	6°14'	4°36'	3°37'	2°33'
	M _x	2.80	2.15	2.80	1.92	1.45	0.98
	η _d	0.81	0.78	0.71	0.64	0.58	0.50
	η _s	0.58	0.54	0.44	0.37	0.32	0.26

蝸桿螺旋線、蝸輪齒牙和效率 (n₁=1400)

Worm thread, wheel tooth and efficiency data (n₁=1400)

性能參數

Performance

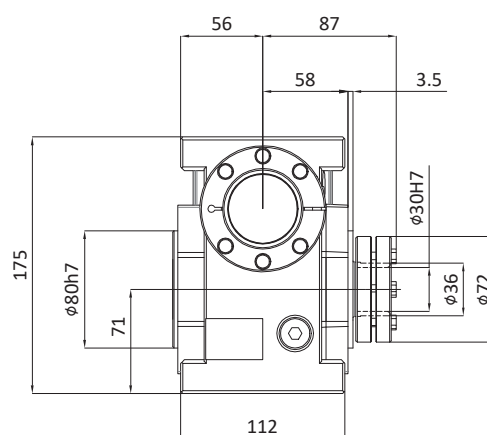
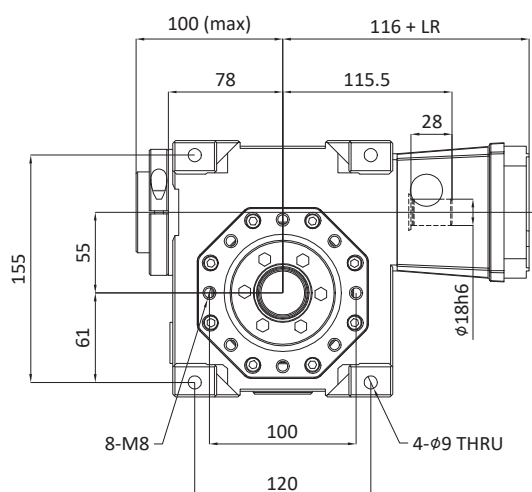
n ₁		3000				1400				900					
SWG	i	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	Fr ₂ [N]	Fa ₂ [N]
055	14.5	0.86	2.1	85	206.9	0.81	1.2	101	96.6	0.75	0.9	112	62.1	6700	4600
	19.5	0.83	1.7	88	153.8	0.78	1.0	105	71.8	0.72	0.8	116	46.2	6700	4600
	30	0.76	1.4	100	100	0.71	0.8	118	46.7	0.65	0.6	130	30.0	6700	4600
	45	0.69	1.0	93	67	0.64	0.6	110	31.1	0.58	0.5	120	20.0	6700	4600
	60	0.63	0.8	94	50	0.58	0.5	110	23.3	0.52	0.4	119	15.0	6700	4600
	90	0.55	0.6	82	33.3	0.50	0.4	100	15.6	0.44	0.3	105	10.0	6700	4600

參數符號對應表請參考 P.34

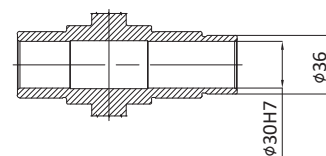
Please refer to P.34 of Symbol Table and Descriptions.

迫緊環尺寸圖

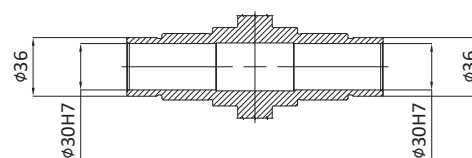
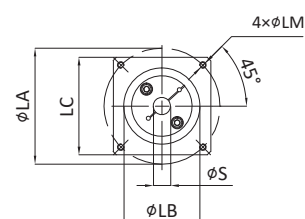
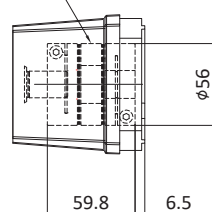
Shrink Disc Dimension Charts



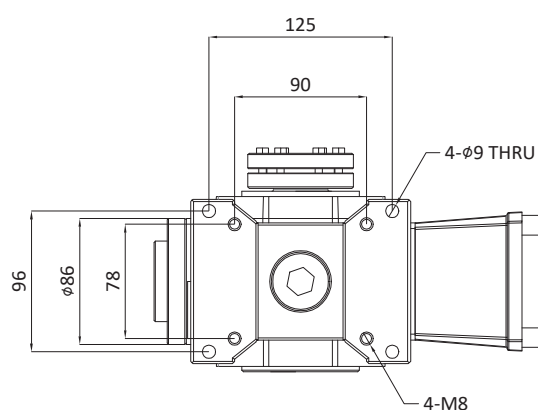
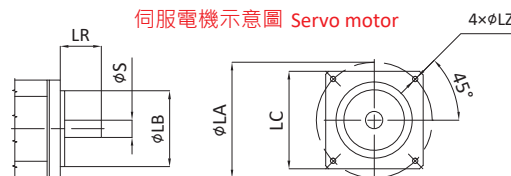
迫緊環孔輸出 Hollow shaft for shrink disc



雙迫緊環孔輸出 Hollow shaft for double shrink disc

伺服聯軸器
Servo Coupling

伺服電機示意圖 Servo motor



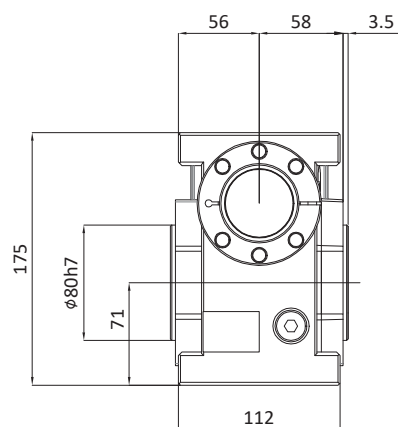
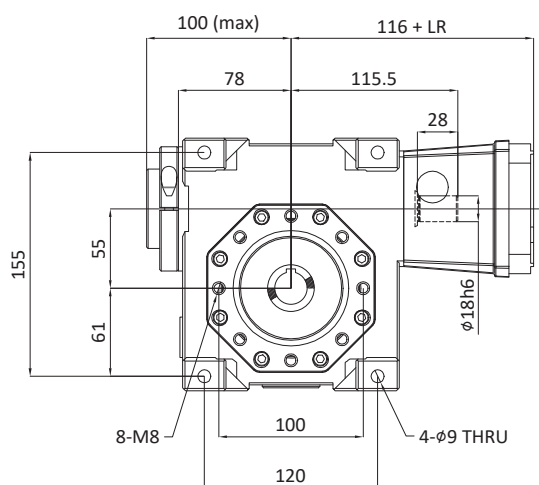
LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

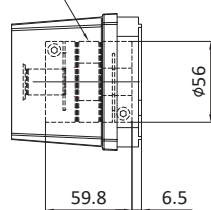
LA / LB / LC / LM / LR / S : By servo motor

中空軸 (有鍵槽) 尺寸圖

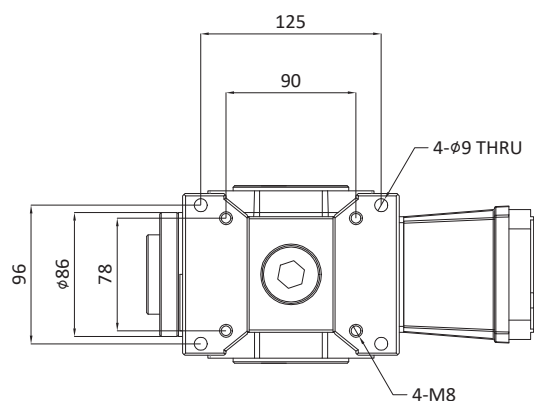
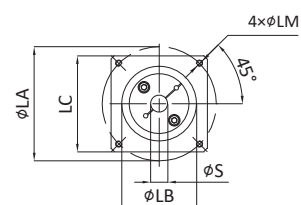
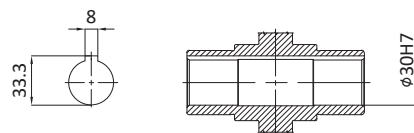
Hollow Shaft with Keyway Dimension Charts



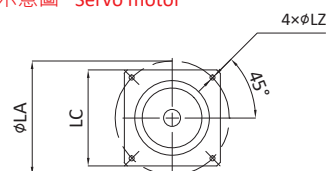
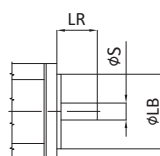
伺服聯軸器
Servo Coupling



中空軸(有鍵槽)孔輸出 Hollow shaft with keyway



伺服電機示意圖 Servo motor



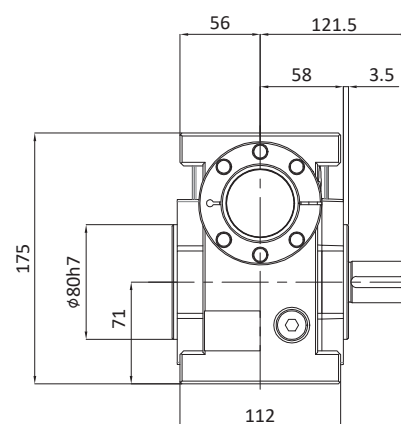
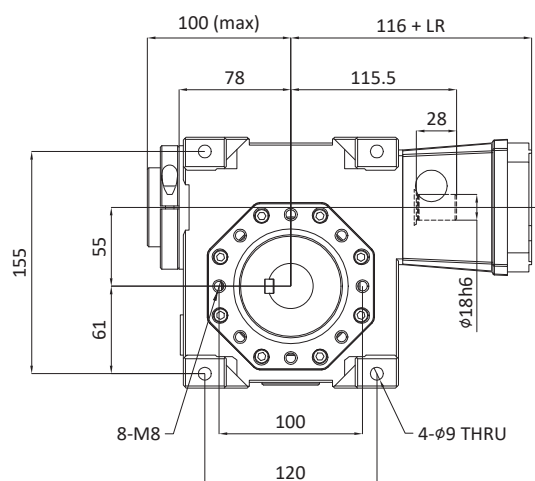
LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

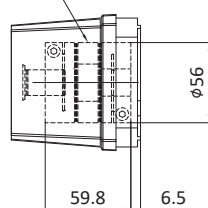
LA / LB / LC / LM / LR / S : By servo motor

實心軸尺寸圖

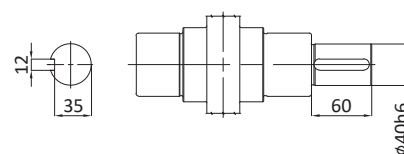
Solid Shaft Dimension Charts



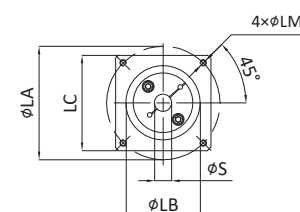
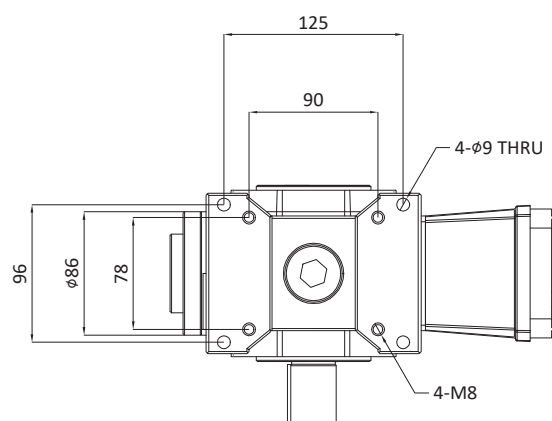
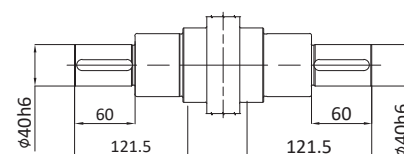
伺服聯軸器
Servo Coupling



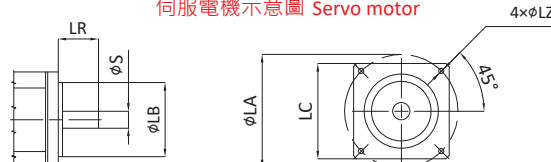
單輸出軸 Single solid shaft



雙輸出軸 Double solid shaft



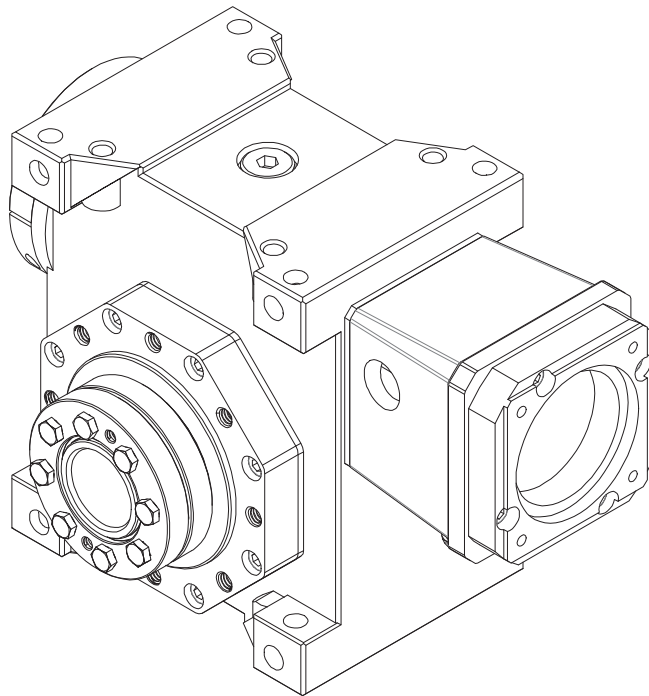
伺服電機示意圖 Servo motor



LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm
LA / LB / LC / LM / LR / S : By servo motor

SWG063



P₀ 超精密級 2 弧分
P₁ 精密級 3~5 弧分

P₀ Ultra precision 2 arcmin
P₁ Precision 3~5 arcmin

嚙合參數

Mesh Data

SWG	i	14.5	19.5	30	45	60	90
063	Z ₁	2	2	1	1	1	1
	Y	12°50'	10°29'	6°30'	4°48'	3°47'	2°40'
	M _x	3.25	2.50	3.25	2.22	1.68	1.13
	η _d	0.82	0.80	0.73	0.67	0.61	0.53
	η _s	0.59	0.54	0.45	0.38	0.33	0.27

蝸桿螺旋線、蝸輪齒牙和效率 (n₁=1400)

Worm thread, wheel tooth and efficiency data (n₁=1400)

性能參數

Performance

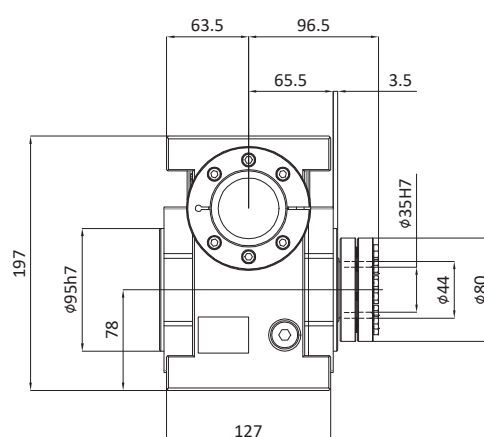
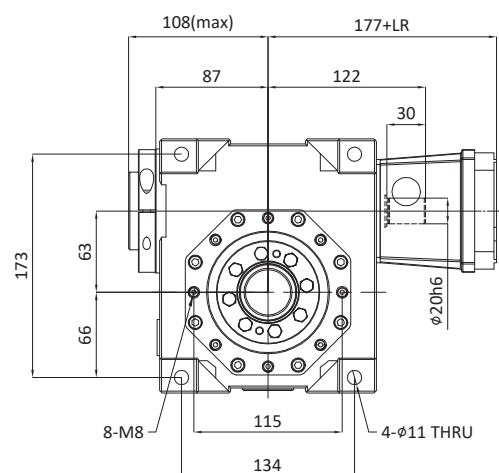
n ₁		3000				1400				900					
SWG	i	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	Fr ₂ [N]	Fa ₂ [N]
063	14.5	0.87	2.5	103	206.9	0.82	1.7	140	96.6	0.76	1.3	155	62.1	8400	8100
	19.5	0.85	1.8	100	153.8	0.80	1.2	135	71.8	0.74	0.9	148	46.2	8400	8100
	30	0.78	1.6	120	100.0	0.73	1.1	160	46.7	0.67	0.8	175	30.0	8400	8100
	45	0.73	1.1	106	67.0	0.67	0.8	140	31.1	0.61	0.5	120	20.0	8400	8100
	60	0.67	0.7	95	50.0	0.62	0.5	130	23.3	0.56	0.4	138	15.0	8400	8100
	90	0.58	0.6	90	33.3	0.53	0.4	120	15.6	0.47	0.3	133	10.0	8400	8100

參數符號對應表請參考 P.34

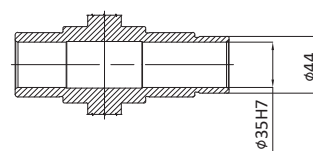
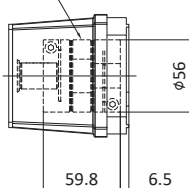
Please refer to P.34 of Symbol Table and Descriptions.

迫緊環尺寸圖

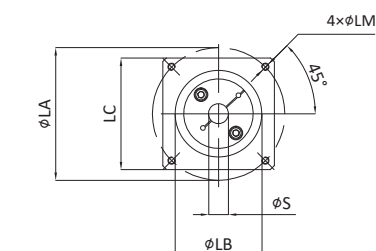
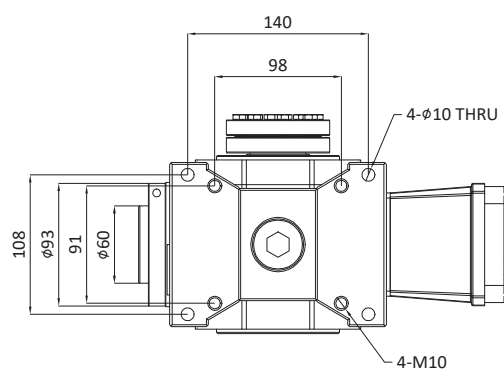
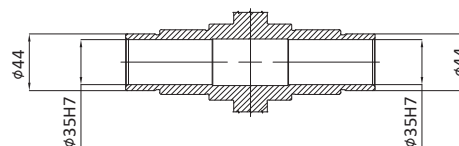
Shrink Disc Dimension Charts



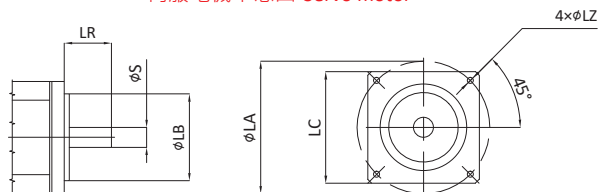
迫緊環孔輸出 Hollow shaft for shrink disc

伺服聯軸器
Servo Coupling

雙迫緊環孔輸出 Hollow shaft for double shrink disc



伺服電機示意圖 Servo motor



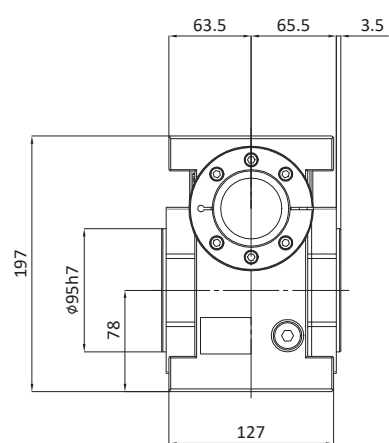
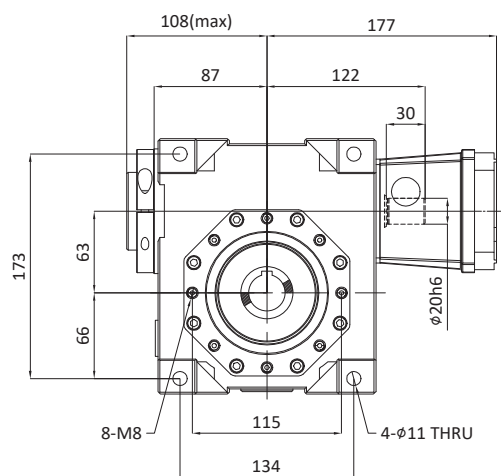
LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

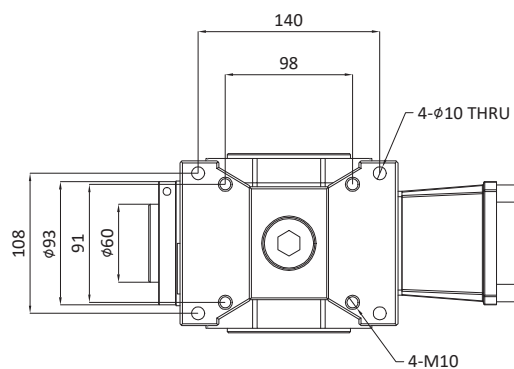
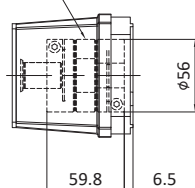
LA / LB / LC / LM / LR / S : By servo motor

中空軸 (有鍵槽) 尺寸圖

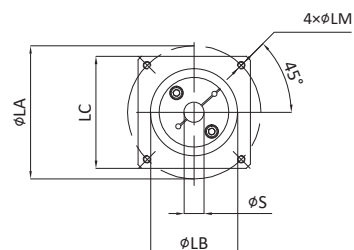
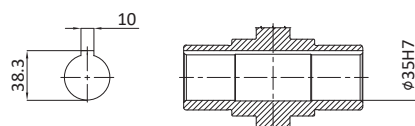
Hollow Shaft with Keyway Dimension Charts



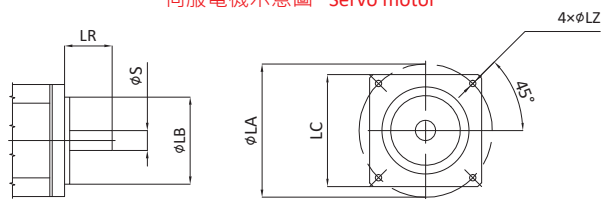
伺服聯軸器
Servo Coupling



中空軸(有鍵槽)孔輸出 Hollow shaft with keyway



伺服電機示意圖 Servo motor

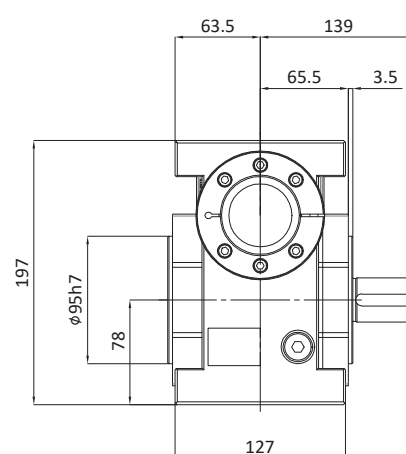
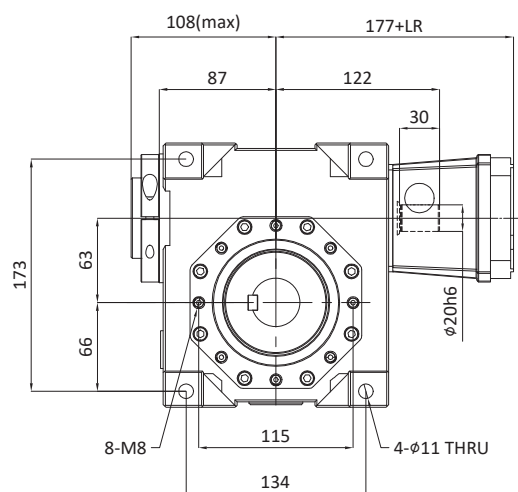


LA / LB / LC / LM / LR / S : 按伺服電機定之

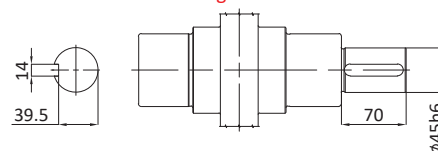
單位 / Dimension : mm
LA / LB / LC / LM / LR / S : By servo motor

實心軸尺寸圖

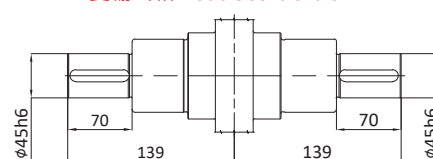
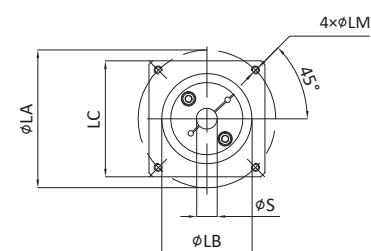
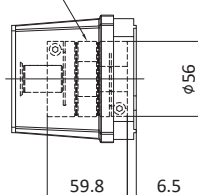
Solid Shaft Dimension Charts



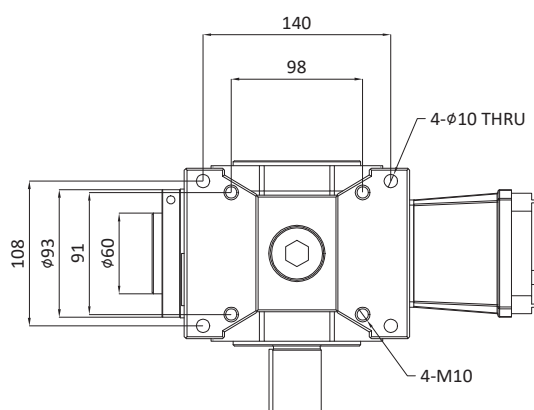
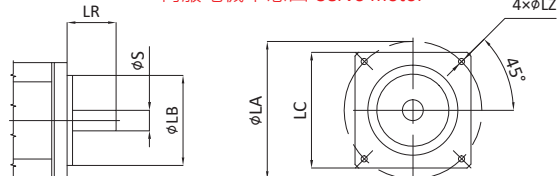
單輸出軸 Single solid shaft



雙輸出軸 Double solid shaft

伺服聯軸器
Servo Coupling

伺服電機示意圖 Servo motor

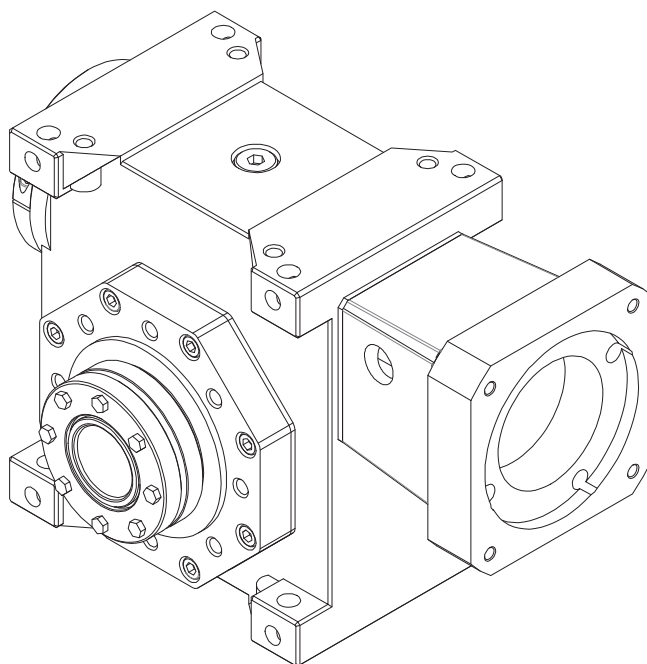


LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

LA / LB / LC / LM / LR / S : By servo motor

SWG075



P₀ 超精密級 1 弧分
P₁ 精密級 2~4 弧分

P₀ Ultra precision 1 arcmin
P₁ Precision 2~4 arcmin

嚙合參數

Mesh Data

SWG	i	14.5	19.5	30	45	60	90
075	Z ₁	2	2	1	1	1	1
	Y	14°02'	11°18'	7°07'	5°13'	4°05'	2°56'
	M _x	4.00	3.00	4.00	2.68	2.00	1.37
	η _d	0.84	0.81	0.75	0.69	0.64	0.56
	η _s	0.60	0.57	0.46	0.40	0.35	0.27

蝸桿螺旋線、蝸輪齒牙和效率 (n₁=1400)

Worm thread, wheel tooth and efficiency data (n₁=1400)

性能參數

Performance

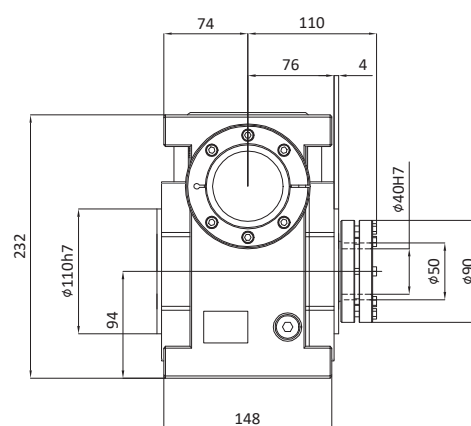
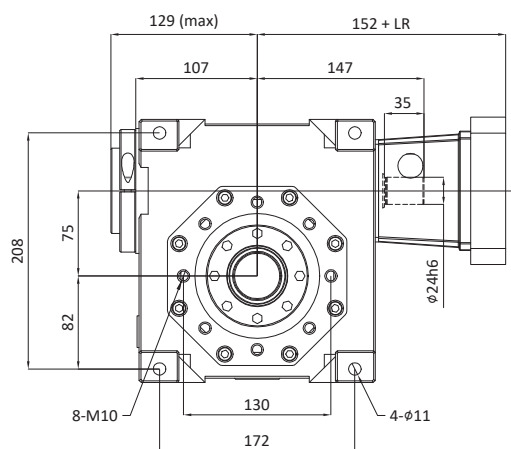
n ₁		3000				1400				900					
SWG	i	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	Fr ₂ [N]	Fa ₂ [N]
075	14.5	0.89	3.5	150	206.9	0.84	2.3	200	96.6	0.78	1.9	235	62.1	10000	10000
	19.5	0.86	2.9	160	153.8	0.81	1.9	210	71.8	0.75	1.5	235	46.2	10000	10000
	30	0.80	2.2	170	100.0	0.75	1.5	230	46.7	0.69	1.2	260	30.0	10000	10000
	45	0.74	1.6	160	67.0	0.69	1.1	216	31.1	0.63	0.8	232	20.0	10000	10000
	60	0.69	1.1	145	50.0	0.64	0.8	200	23.3	0.58	0.6	210	15.0	10000	10000
	90	0.61	0.8	125	33.3	0.56	0.6	185	15.6	0.50	0.4	190	10.0	10000	10000

參數符號對應表請參考 P.34

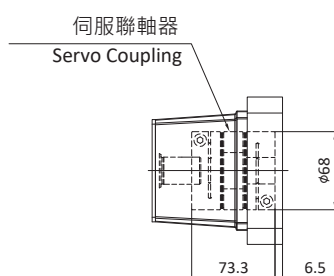
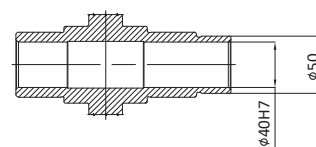
Please refer to P.34 of Symbol Table and Descriptions.

迫緊環尺寸圖

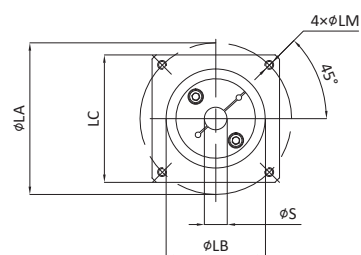
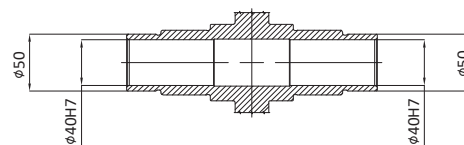
Shrink Disc Dimension Charts



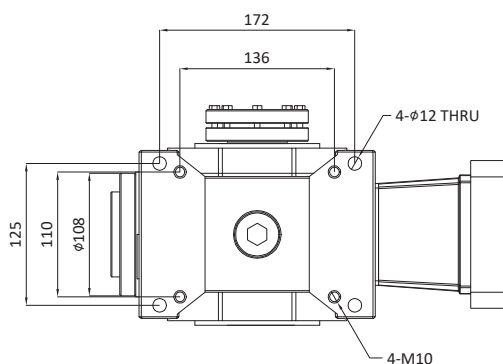
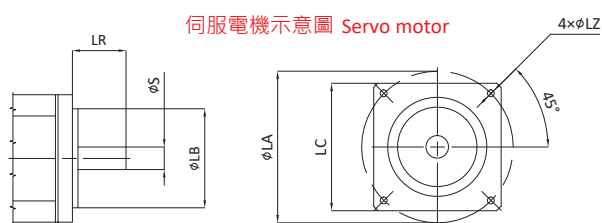
迫緊環孔輸出 Hollow shaft for shrink disc



雙迫緊環孔輸出 Hollow shaft for double shrink disc



伺服電機示意圖 Servo motor



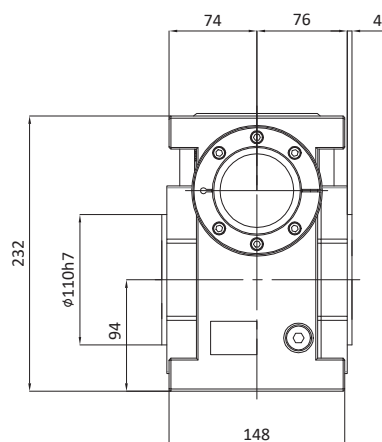
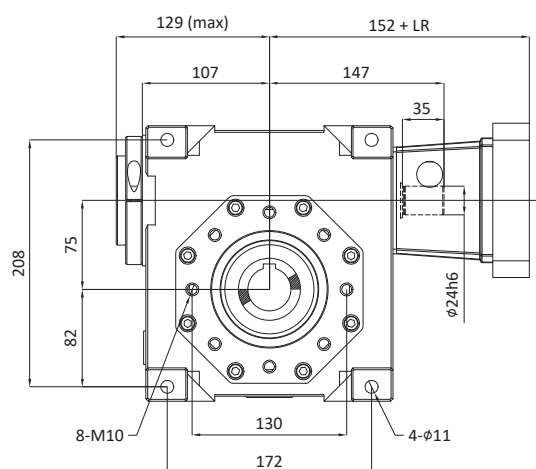
LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

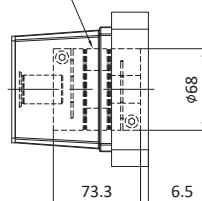
LA / LB / LC / LM / LR / S : By servo motor

中空軸 (有鍵槽) 尺寸圖

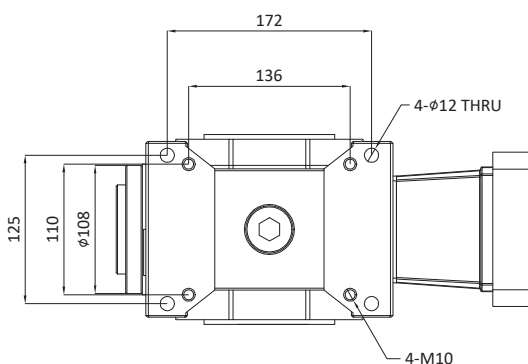
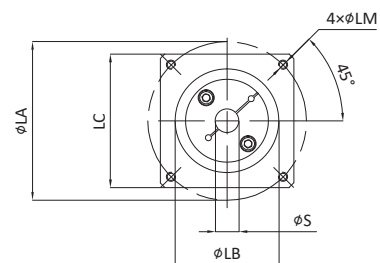
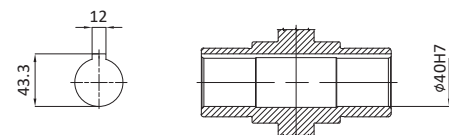
Hollow Shaft with Keyway Dimension Charts



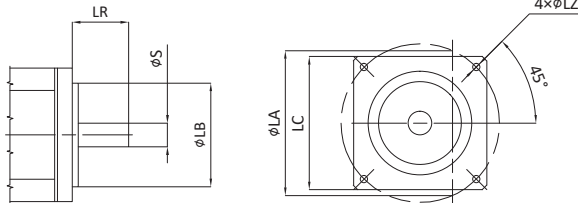
伺服聯軸器
Servo Coupling



中空軸(有鍵槽)孔輸出 Hollow shaft with keyway



伺服電機示意圖 Servo motor



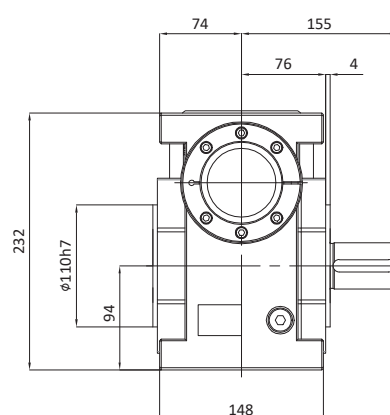
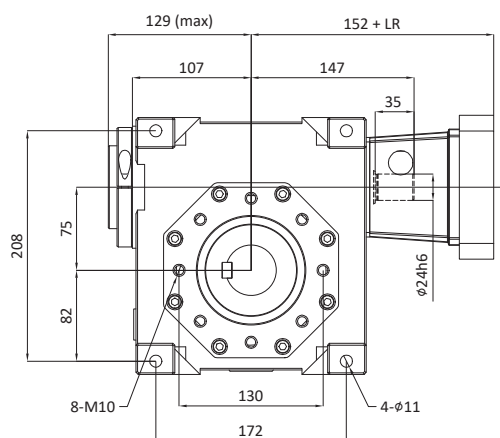
LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

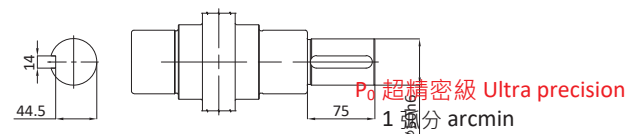
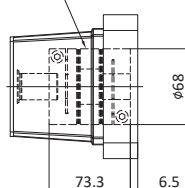
LA / LB / LC / LM / LR / S : By servo motor

實心軸尺寸圖

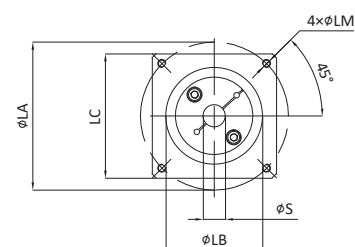
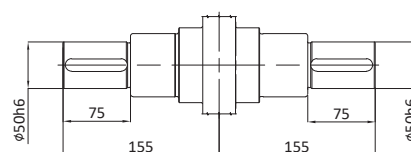
Solid Shaft Dimension Charts



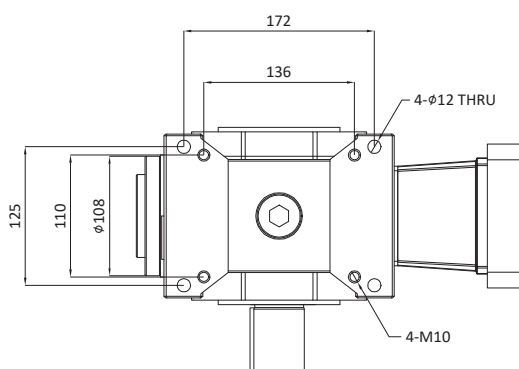
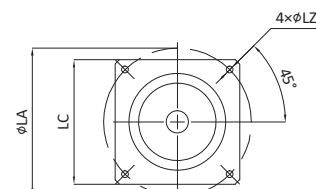
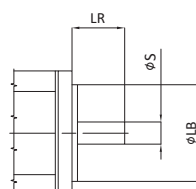
單輸出軸 Single solid shaft

伺服聯軸器
Servo Coupling

雙輸出軸 Double solid shaft



伺服電機示意圖 Servo motor

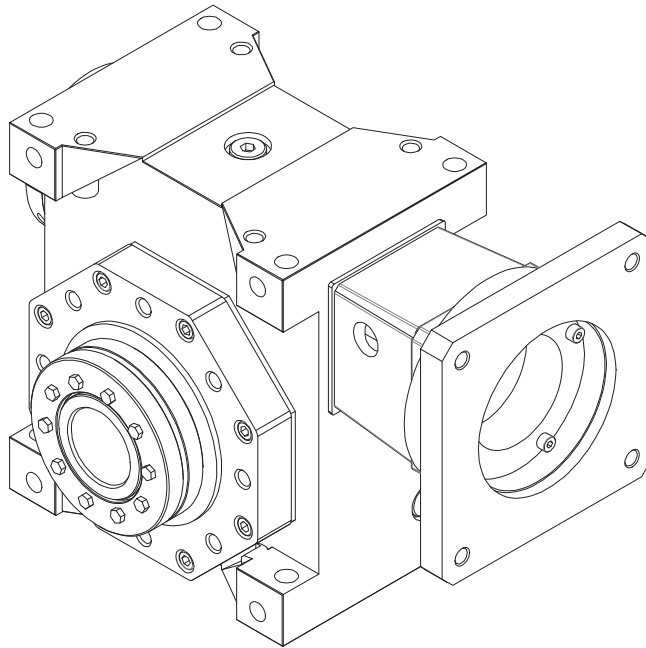


LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

LA / LB / LC / LM / LR / S : By servo motor

SWG090



P₀ 超精密級 1 弧分
P₁ 精密級 2~4 弧分

P₀ Ultra precision 1 arcmin
P₁ Precision 2~4 arcmin

嚙合參數

Mesh Data

SWG	i	14.5	19.5	30	45	60	90
090	Z ₁	2	2	1	1	1	1
	Y	15°05'	12°14'	7°40'	5°45'	4°36'	3°15'
	M _x	4.80	3.60	4.80	3.25	2.50	1.67
	η _d	0.85	0.83	0.77	0.72	0.68	0.60
	η _s	0.63	0.59	0.49	0.43	0.38	0.30

蝸桿螺旋線、蝸輪齒牙和效率 (n₁=1400)

Worm thread, wheel tooth and efficiency data (n₁=1400)

性能參數

Performance

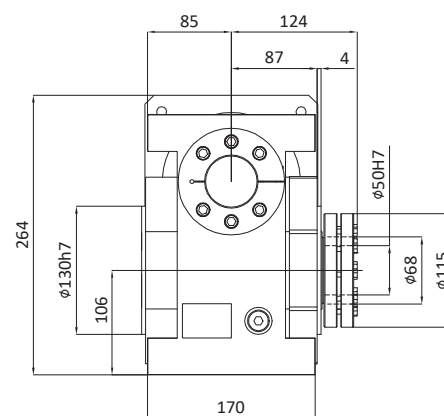
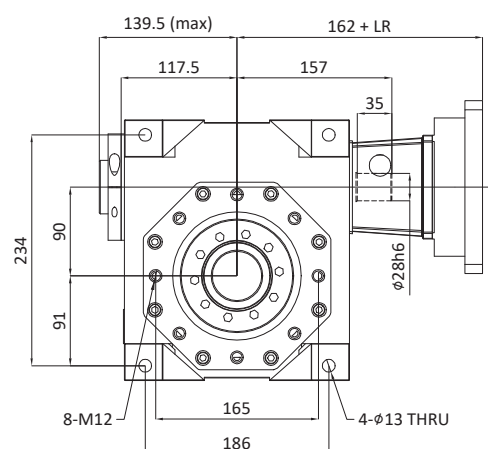
n ₁		3000				1400				900					
SWG	i	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	η _d Eff.	P ₁ [kW]	M ₂ [Nm]	n ₂ [min ⁻¹]	Fr ₂ [N]	Fa ₂ [N]
090	14.5	0.90	6.3	270	206.9	0.85	4.1	360	96.6	0.79	3.3	420	62.1	15000	12300
	19.5	0.88	4.6	260	153.8	0.83	3.1	355	71.8	0.77	2.4	390	46.2	15000	12300
	30	0.82	4.0	310	100.0	0.77	2.6	410	46.7	0.71	2.0	460	30.0	15000	12300
	45	0.77	2.6	270	67.0	0.72	1.7	350	31.1	0.66	1.3	400	20.0	15000	12300
	60	0.73	1.8	245	50.0	0.68	1.1	320	23.3	0.62	0.9	350	15.0	15000	12300
	90	0.65	1.3	215	33.3	0.60	0.8	278	15.6	0.54	0.7	300	10.0	15000	12300

參數符號對應表請參考 P.34

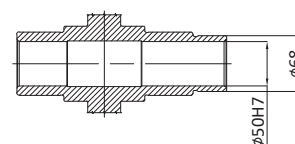
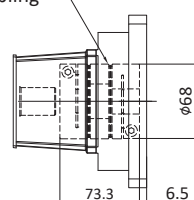
Please refer to P.34 of Symbol Table and Descriptions.

迫緊環尺寸圖

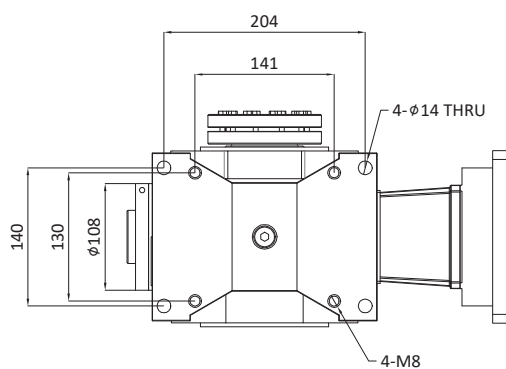
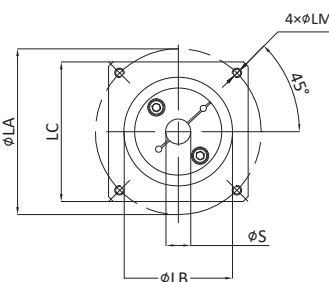
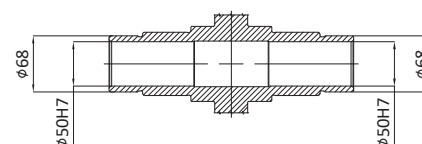
Shrink Disc Dimension Charts



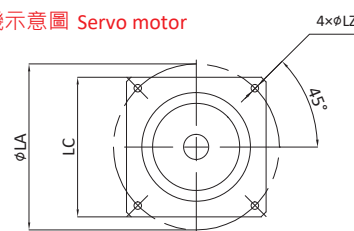
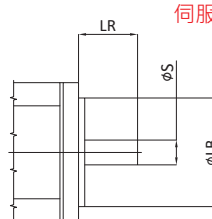
迫緊環孔輸出 Hollow shaft for shrink disc

伺服聯軸器
Servo Coupling

雙迫緊環孔輸出 Hollow shaft for double shrink disc



伺服電機示意圖 Servo motor



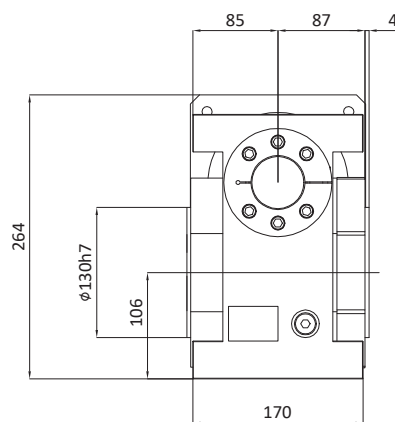
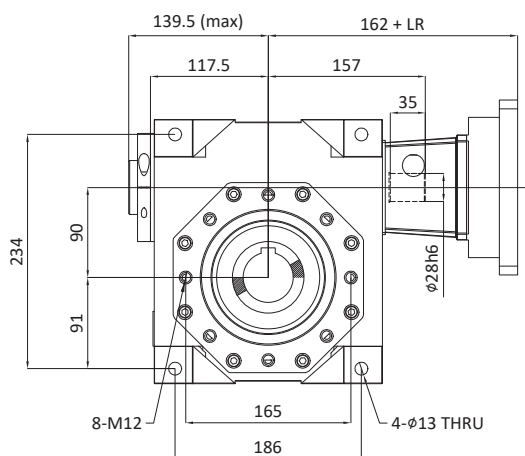
LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

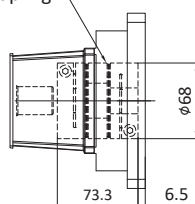
LA / LB / LC / LM / LR / S : By servo motor

中空軸 (有鍵槽) 尺寸圖

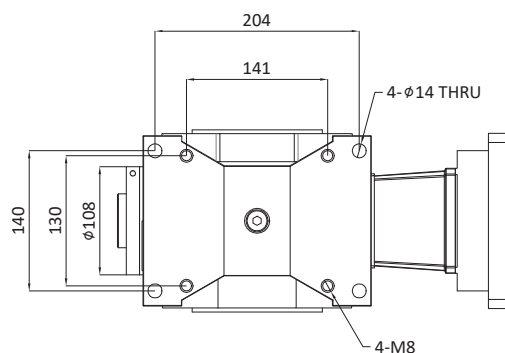
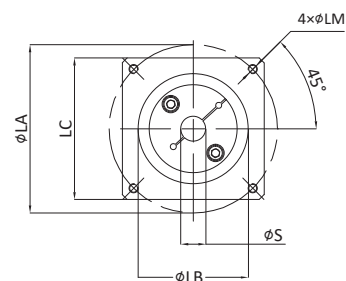
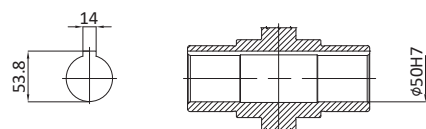
Hollow Shaft with Keyway Dimension Charts



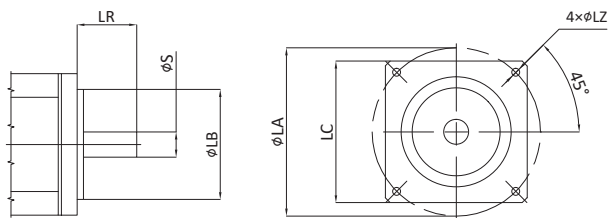
伺服聯軸器
Servo Coupling



中空軸(有鍵槽)孔輸出 Hollow shaft with keyway



伺服電機示意圖 Servo motor

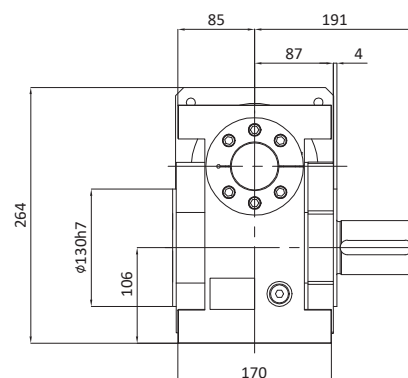
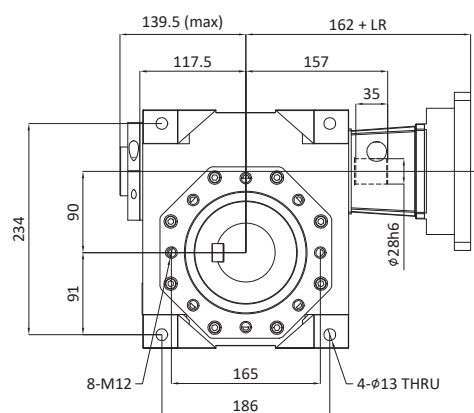


LA / LB / LC / LM / LR / S : 按伺服電機定之

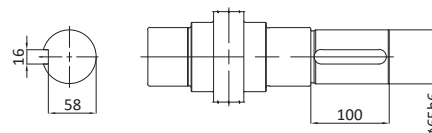
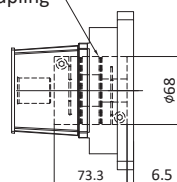
單位 / Dimension : mm
LA / LB / LC / LM / LR / S : By servo motor

實心軸尺寸圖

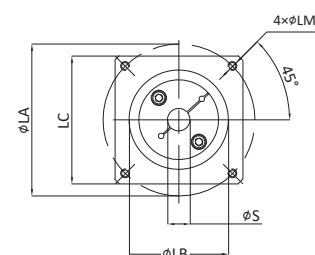
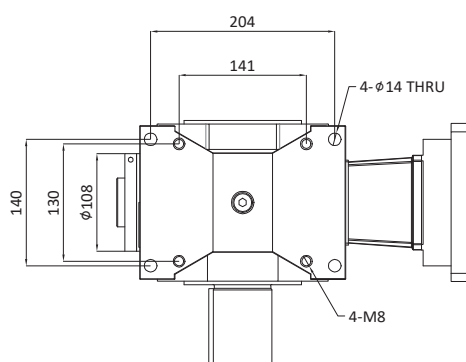
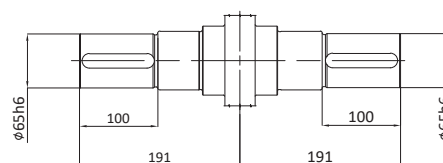
Solid Shaft Dimension Charts



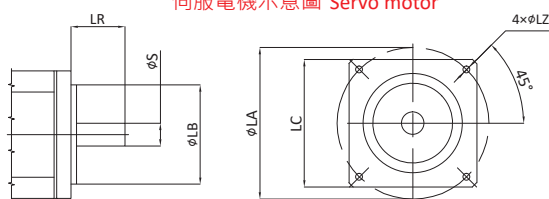
單輸出軸 Single solid shaft

伺服聯軸器
Servo Coupling

雙輸出軸 Double solid shaft



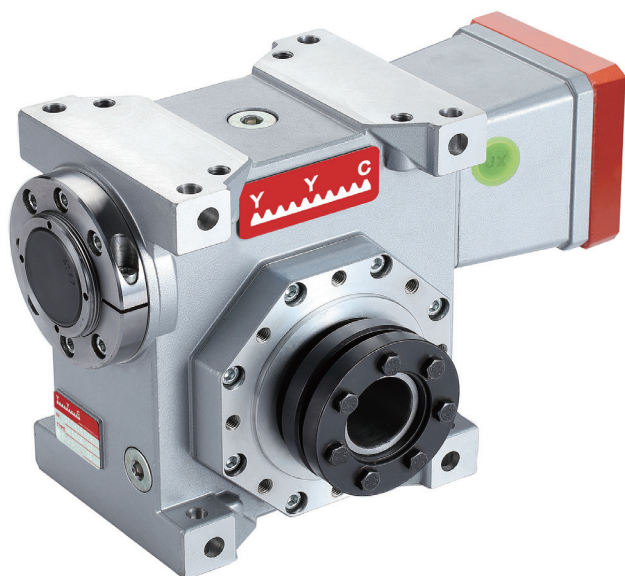
伺服電機示意圖 Servo motor



LA / LB / LC / LM / LR / S : 按伺服電機定之

單位 / Dimension : mm

LA / LB / LC / LM / LR / S : By servo motor



類型
Type
SWG 075

減速比
Ratio
30

輸出
Output
SDR

背隙
Backlash
P₀

安裝方位
Mounting position
B3

電機
Electric motor
1FK7042...

電機型號 Motor type

安裝方位 Mounting position
B3, B6, B7, B8, V5, V6

背隙 Backlash
P₀ 超精密級 Ultra precision
1 弧分 arcmin (75, 90)
2 弧分 arcmin (45, 50, 55, 63)
P₁ 精密級 Precision
2~4 弧分 arcmin (75, 90)
3~5 弧分 arcmin (45, 50, 55, 63)

輸出軸 Output shaft
SDR, SDL 迫緊環孔輸出 Hollow shaft for shrink disc
DSD 雙迫緊環孔輸出 Hollow shaft for double shrink disc
WKE 中空軸(有鍵槽)孔輸出 Hollow shaft with keyway
SSR, SSL 單輸出軸 Single solid shaft
DSS 雙輸出軸 Double solid shaft

減速比 Ratio
14.5, 19.5, 30, 45, 60, 90

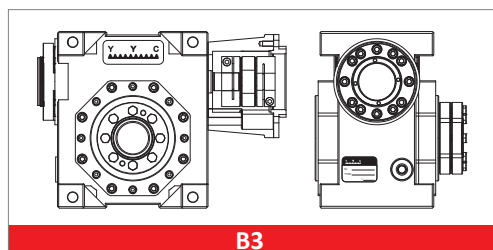
減速機尺寸 Size
45, 50, 55, 63, 75, 90

減速機型號 Reducer type

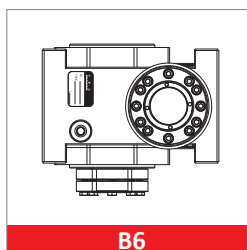
SWG 系列

安裝方位

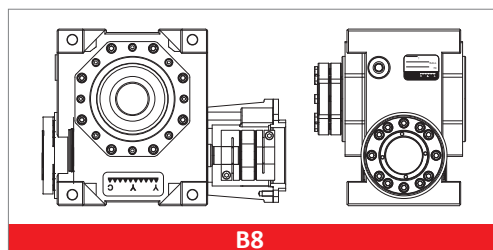
Mounting Positions



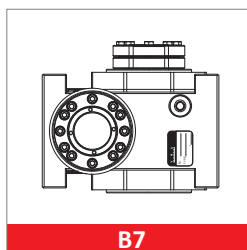
B3



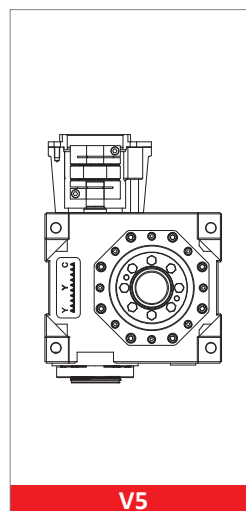
B6



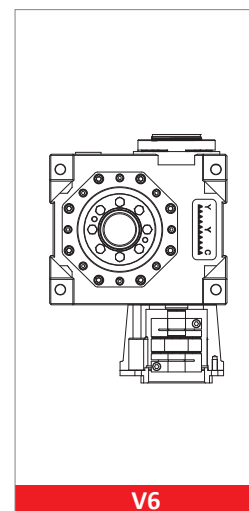
B8



B7



V5



V6

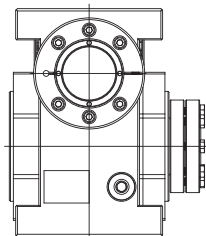
輸出型式

Output Types

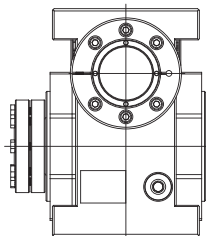
迫緊環孔輸出
Hollow shaft for shrink disc

中空軸(有鍵槽)孔輸出
Hollow shaft with keyway

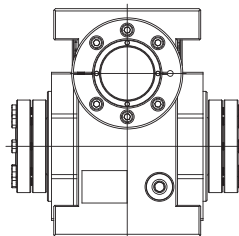
SDR



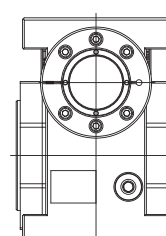
SDL



DSD



WKE

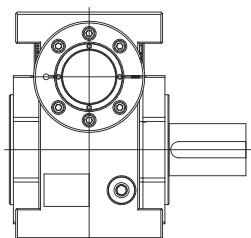


如無特殊說明，迫緊環聯軸器安裝在 SDR 的位置
The shrink disc coupling will be supplied in SDR position if no special instruction is given.

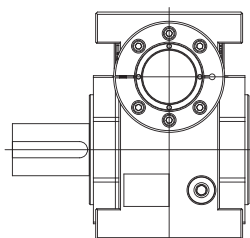
單輸出軸
Single solid shaft

雙輸出軸
Double solid shaft

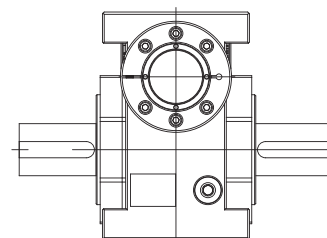
SSR



SSL



DSS



選型

Selection

以下為選擇減速機的原理以及正確使用方法，具體的數值請參照相對應的章節。

1.0 輸出扭矩

1.1 額定輸出扭矩 M_{n2} [Nm]

扭矩作用於連續平穩運轉的減速機且在工作係數 $f_s=1$ 的情況下測出的數值。

1.2 需求輸出扭矩 M_{r2} [Nm]

基於實際所需，數值等於或小於減速機的額定扭矩 M_{n2} 。

1.3 計算輸出扭矩 M_{c2} [Nm]

在選擇減速機時有用。它要考慮實際需求的扭矩 M_{r2} 以及工作係數 f_s ，由以下關係式計算出：

$$M_{c2} = M_{r2} \cdot f_s \leq M_{n2}$$

2.0 功率

2.1 額定輸入功率 P_{n1} [kW]

減速機安全運轉時的功率 (kW) 值，列於參數表中。它是在速度等於 n_1 且工作係數 $f_s=1$ 的情況下得出的。

2.2 額定輸出功率 P_{n2} [kW]

基於實際所需，數值等於或小於減速機的額定扭矩 M_{n2} 。

$$P_{n2} = P_{n1} \cdot \eta_d$$

$$P_{n2} = \frac{M_{n2} \cdot n_2}{9550}$$

3.0 效率

效率是影響某些應用的主要因素，它的值基本由齒輪副設計的參數決定。在嚙合參數表上記錄了動態及靜態效率值 ($n_1=1400$)。注意這些值只適用於磨合完成的在工作溫度下運轉的減速箱。

3.1 動態效率 $[\eta_d]$

動態效率和輸出功率 P_2 以及輸入功率 P_1 的關係：

$$\eta_d = \frac{P_2}{P_1}$$

3.2 靜態效率 $[\eta_s]$

在減速機剛啟動時的效率。雖然對連續傳動沒有實際的意義，但在選擇斷續傳動頻繁的減速機時卻十分重要。

The following information shows the principle and the correct use of gearbox.

Please refer to the relevant chapter for specific data of the gearbox.

1.0 Output Torque

1.1 Nominal output torque M_{n2} [Nm]

The torque that can be transmitted continuously through the output shaft with the gear unit operated under a service factor $f_s=1$.

1.2 Required torque at output shaft M_{r2} [Nm]

The torque demand based on application requirement.

It is recommended to be equal to or less than torque M_{n2} the gearbox under study is rated for.

1.3 Calculated output torque M_{c2} [Nm]

M_{c2} is necessary when selecting the gearbox and it consists required torque (M_{r2}) and service factor (f_s) by the following equation:

$$M_{c2} = M_{r2} \cdot f_s \leq M_{n2}$$

2.0 Power

2.1 Nominal input power P_{n1} [kW]

The value can be found in the gearbox performance charts. It is concluded on input speed n_1 and service factor $f_s=1$ which can be transmitted safely to the gearbox.

2.2 Nominal output power P_{n2} [kW]

This value is the power transmitted at gearbox output. It can be calculated by the following equations:

$$P_{n2} = P_{n1} \cdot \eta_d$$

$$P_{n2} = \frac{M_{n2} \cdot n_2}{9550}$$

3.0 Efficiency

Efficiency has a major influence on certain applications, and its value depends on gear pair designing.

The mesh data table shows dynamic efficiency ($n_1=1400$) and static efficiency values.

Noted that these values are only available after the units has been run in and is at the working temperature.

3.1 Dynamic efficiency $[\eta_d]$

The following equation shows the correlation between input power P_1 and output power P_2 on dynamic efficiency.

$$\eta_d = \frac{P_2}{P_1}$$

3.2 Static efficiency $[\eta_s]$

Static efficiency occurs at start-up of the gearbox.

Although this is not a significant factor for continuous drive components, it may be a critical factor when selecting worm gear motors operating under intermittent duty.

4.0 工作係數 [f_s]

減速機的工作係數 (f_s) 主要取決於減速機的運行條件，為了選擇最合適的工作環境係數進行正確的組合，必須考慮如下因素：

1. 減速機的負載形式：
 - A - 均衡負荷, $f_a \leq 0.3$
 - B - 中等衝擊, $f_a \leq 3$
 - C - 嚴重衝擊, $f_a \leq 10$
2. 工作時間：小時 / 天 (Δ)
3. 啟動頻率：次 / 小時 ($*$)

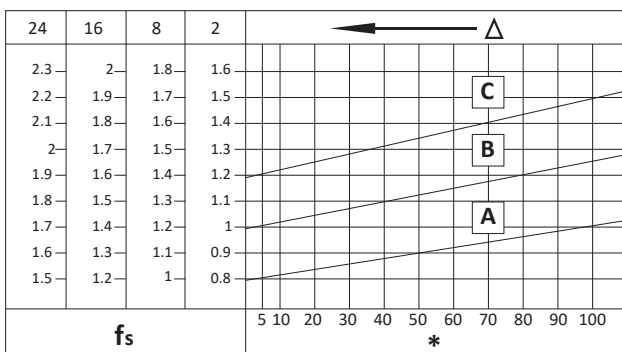
$$f_a = J_e / J_m$$

- J_e (kgm^2): 在電機軸上衰降的慣性矩
- J_m (kgm^2): 電機慣性矩
- 如果 $f_a > 10$ 時，請與技術服務部聯繫

A- 輕質材料螺旋輸送機、風扇、裝配線、輕質材料皮帶輸送機、小型攪拌機、提升機、清潔機、灌裝機、控制器。

B- 捲繞裝置、木工機械、貨物提升機、平衡器、螺紋機、介質攪拌機、重型材料皮帶輸送機、絞盤、移動門、刮機、包裝機、起重機、磨割機、卷板機、齒輪泵。

C- 重型材料攪拌機、切割機、壓力機、離心機、旋轉支撐、重型材料絞盤和提升機、磨床、石材、升降機、鑽孔機、錘式粉碎機、凸輪壓力機、折疊機、運輸帶、翻斗車、振動器、撕碎機。



4.0 Service Factor [f_s]

The service factor (f_s) depends on the operating conditions.

To find the most suitable combination of service factor and gearbox, the following factors must be considered:

1. type of load of the operated machine :
 - A - uniform, $f_a \leq 0.3$
 - B - moderate shocks, $f_a \leq 3$
 - C - heavy shocks, $f_a \leq 10$
2. daily operating time: hours / day (Δ)
3. start-up frequency: starts / hour ($*$)

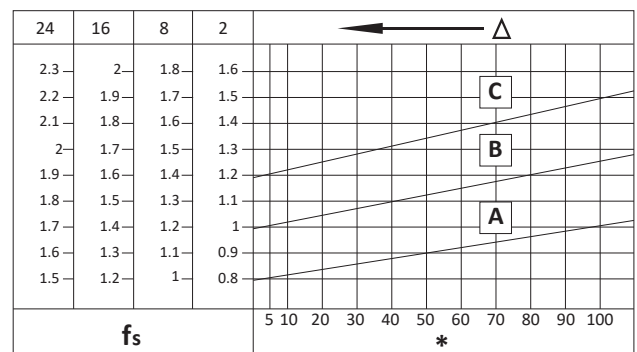
$$f_a = J_e / J_m$$

- J_e (kgm^2): moment of the external inertia reduced at the drive shaft
- J_m (kgm^2): motor moment of inertia
- If $f_a > 10$, please contact our Technical Service

A -Screw feeders for light materials, fans, assembly lines, conveyor belts for light materials, small mixers, lifts, cleaning machines, fillers, control machines.

B -Winding devices, woodworking machine feeders, goods lifts, balancers, threading machines, medium mixers, conveyor belts for heavy materials, winches, sliding doors, fertilizer scrapers, packing machines, crane mechanisms, milling cutters, folding machines, gear pumps.

C -Mixers for heavy materials, shears, presses, centrifuges, rotating supports, winches and lifts for heavy materials, grinding lathes, stone mills, bucket elevators, drilling machines, hammer mills, cam presses, folding machines, turntables, tumbling barrels, vibrators, shredders.



參數符號對應表

Symbol Table and Descriptions

符號 Symbols	單位 Units	注解	Description
P	kW	功率	Power
P₁	kW	輸入功率	Input Power
P₂	kW	輸出功率	Output Power
P_{n1}	kW	額定輸入功率	Nominal Input Power
M₂	Nm	輸出扭矩	Output Torque
M_{c2}	Nm	計算輸出扭矩	Calculated Output Torque
M_{n2}	Nm	額定輸出扭矩	Nominal Output Torque
M_{r2}	Nm	需求輸出扭矩	Required Torque at Output Shaft
n₁	min ⁻¹	輸入轉速	Input RPM
n₂	min ⁻¹	輸出轉速	Output RPM
i	-	減速比	Ratio
η_d	-	動態效率	Dynamic Efficiency
η_s	-	靜態效率	Static Efficiency
Z₁	-	蝸桿齒數	Number of Worm Thread
M_x	-	軸向模數	Axial Module
f_s	-	工作係數	Service Factor
J_e	kgm ²	在電機軸上衰降的慣性矩	Moment of The External Inertia reduced at The Drive Shaft
J_m	kgm ²	電機慣性矩	Motor Moment of Inertia
F_{r1}	N	輸入軸徑向負荷	Input Shaft Radial Load
F_{r2}	N	輸出軸徑向負荷	Output Shaft Radial Load
F_{a2}	N	輸出軸軸向負荷	Output Shaft Axial Load



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