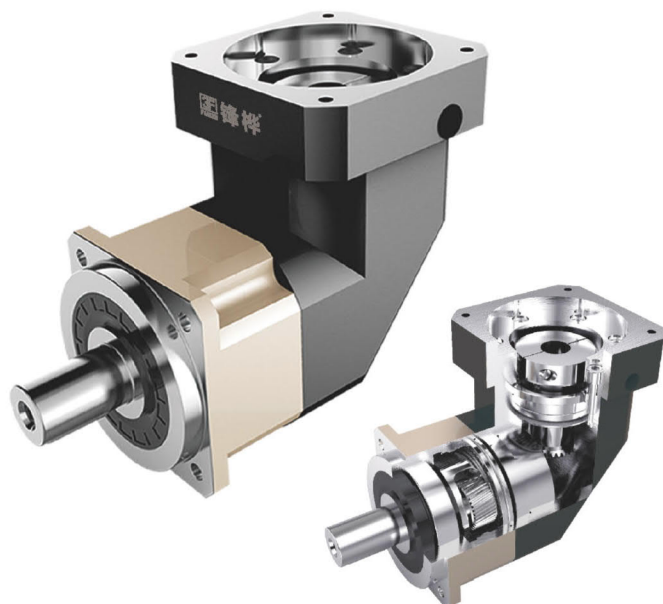


轉角高精密高力矩型行星減速機

High Precision High Torque Right Angle Planetary Gearbox

PAR



1. 省空間

直交型減速機使用螺旋式傘齒輪，馬達的安裝可實現90度彎曲，節省了安裝空間。

2. 高剛性、高扭矩

使用整體式滾針軸承，大大提高了剛性和扭矩。

3. 連接器、軸套方式

可以安裝到馬達上。

4. 無潤滑脂泄漏

使用高粘度、不易分離的潤滑脂、有效防止潤滑脂泄漏。

5. 維修方便

在產品壽命期內無需更換潤滑脂，安裝更便捷。

1. Space-saving

The straight cross reducer uses spiral bevel gear. The installation of the motor can achieve 90 degree bending and save the installation space.

2. High rigidity & torque The use of integral needle roller bearings greatly improves the rigidity and torque.

3. Connector and shaft sleeve mode

It can be installed on any motor in the world.

4. No grease leakage

The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.

5. Convenient maintenance

No need to replace the grease in the product life period, and the installation is more convenient.

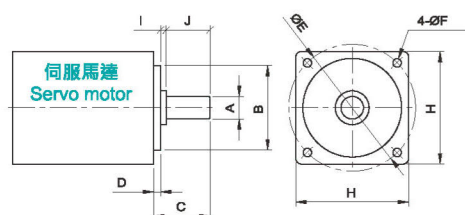
減速機的選型 Model Selection of Speed Reducers

PAR 系列 Type

PAR090	—	10	—	S1	—	P1	/	馬達
減速機型式 Reducer Model		出力軸鍵槽 Output Shaft Keyway		馬達型號 Motor Model				
PAR042, PAR060, PAR090, PAR115 PAR142, PAR180, PAR220, PAR240 PAR280, PAR300		S1: 實心軸，無鍵槽 (Solid Output Shaft No Keyway) S2: 標準品，有鍵槽 Standard (Keyway) S3: 輸出為孔 Output for holes		馬達製造商及型號 Motor Manufacturer & Model				
減速比 Ratio		背隙等級 Backlash Grade						
單節 1-stage: 3, 4, 5, 6, 7, 8, 9, 10 雙節 2-stage: 15, 20, 25, 30, 35, 40, 50, 70, 80, 100, 120, 140, 160, 180, 200		P0: 高精密背隙 High precision backlash P1: 精密背隙 Precision backlash P2: 標準背隙 Standard backlash						

減速器匹配電機需要確認下列尺寸：

The gearbox matching motor needs to be confirmed with following dimensions :



A	B	C	D	E	F	H	I	J

行星速機訂購編號

減速機型 Type	型號 Model	速比 Ratio	出力軸鍵槽 Output Shaft Keyway	背隙等級 Backlash Class	馬達型號 MOTOR NO.

PAR 減速機性能資料 Reducer Specifications

規格 Specs	單位 Unit	節數 Stage	減速比 Ratio	PAR042	PAR060	PAR090	PAR115	PAR142	PAR180	PAR220
額定輸出力矩 T_{2N} Rated Output Torque	Nm	1	3	20	55	130	208	342	588	1140
			4	19	50	140	290	542	1050	1700
			5	22	60	160	330	650	1200	2000
			6	20	55	150	310	600	1100	1900
			7	19	50	140	300	550	1100	1800
			8	17	50	140	290	542	1050	1700
			9	14	40	100	230	450	900	1500
			10	14	60	160	330	650	1200	2000
			14	19	50	140	300	550	1100	1800
			20	14	40	100	230	450	900	1500
		2	15	20	55	130	208	342	588	1140
			20	20	50	140	290	542	1050	1700
			25	22	60	160	330	650	1200	2000
			30	22	55	130	208	342	588	1140
			35	22	60	160	330	650	1200	2000
			40	22	50	140	290	542	1050	1700
			50	22	60	160	330	650	1200	2000
			70	22	60	160	330	600	1200	2000
			80	22	50	140	290	542	1050	1700
			100	22	60	160	330	650	1200	2000
			120	—	—	150	310	600	1100	1900
			140	—	—	140	300	550	1100	1800
			160	—	—	120	260	500	1000	1600
			180	—	—	98	225	445	895	1495
			200	—	—	100	230	450	900	1500
最大輸出扭矩 T_{2NOT}^1 / Max. Output Torque	Nm	1,2	3~200	3倍額定輸出力矩/3Times of Nominal Output Torque						
額定輸入轉速 n_{1N} / Rated Input Speed	rpm	1,2	3~200	3000	3000	3000	3000	2500	2000	2000
最大輸入轉速 n_{1B} / Max. Input Speed	rpm	1,2	3~200	6000	6000	6000	5500	4500	4500	4000
精密背隙 P0 / Precision Backlash P0	arcmin	1	3~20	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
		2	15~200	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
精密背隙 P1 / Precision Backlash P1	arcmin	1	3~20	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
		2	15~200	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
標準背隙 P2 / Standard Backlash P2	arcmin	1	3~20	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
		2	15~200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
扭轉剛性 / Torsional Rigidity	Nm/arcmin	1,2	3~200	3	6	14	25	56	140	220
容許徑向力 F_{2rB}^2 / Max. Radial Force	N	1,2	3~200	780	1300	3200	6750	9400	14500	50000
容許軸向力 F_{2aB}^2 / Max. Axial Force	N	1,2	3~200	330	700	1580	3300	4700	7200	28000
使用壽命 / Service Life	hr	1,2	3~200	21000 h						
效率 η / Efficiency	%	1	3~20	$\geq 93\%$						
		2	25~200	$\geq 90\%$						
重量 / Weight	kg	1	3~20	0.9	1.5	6.4	13	24.5	51	83
		2	25~200	1.2	2.1	7.8	14.2	27.5	54	95
使用溫度 / Operating Temperature	°C	1,2	3~200	(-15°C ~ +90°C)						
潤滑 / Lubrication		1,2	3~200	全合成潤滑油脂 (Synthetic Grease)						
防護等級 / Protection Class		1,2	3~200	IP65						
安裝方向 / Mounting Position		1,2	3~200	任意方向 (Any Direction)						
噪音值 ($n_1=3000\text{rpm}$, 無負載) / Noise Level	dB(A)	1,2	3~200	≤ 65	≤ 65	≤ 68	≤ 68	≤ 70	≤ 72	≤ 74

減速機轉動慣量 Reducer Rotary Inertia

規格 Specs	單位 Unit	節數 Stage	減速比 Ratio	PAR042	PAR060	PAR090	PAR115	PAR142	PAR180	PAR220
轉動慣量 J_1 Moment of Inertia	kg.cm ²	1	3~10	0.09	0.35	2.25	6.84	23.4	68.9	135.4
			14~20	0.03	0.07	1.87	6.25	21.8	65.6	119.8
		2	15~100	0.09	0.09	0.35	2.25	6.84	23.4	68.9
			120~200	—	—	0.31	1.87	6.25	21.8	65.6

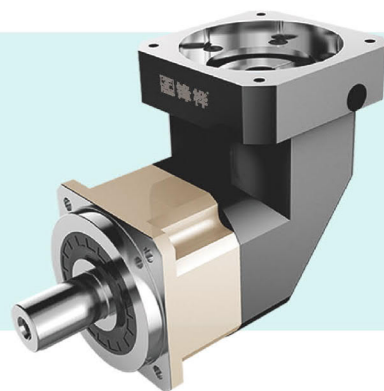
1. 最大加速力矩 $T_{2B}=60\%$ of T_{2NOT} 2. 輸出轉數 100rpm 時，作用於輸出軸中心位置。
3. 三段大減速比不在上表中，有軸加長和加大設計，需要用到請告知銷售人員。

1. The Max. acceleration torque $T_{2B}=60\%$ of T_{2NOT} 2. When output speed is 100rpm, inertia acts on the output shaft center position.
3. 3-stage big ratios are not in the above table. There is shaft lengthening and enlarging design. Please tell sales person if you need it.

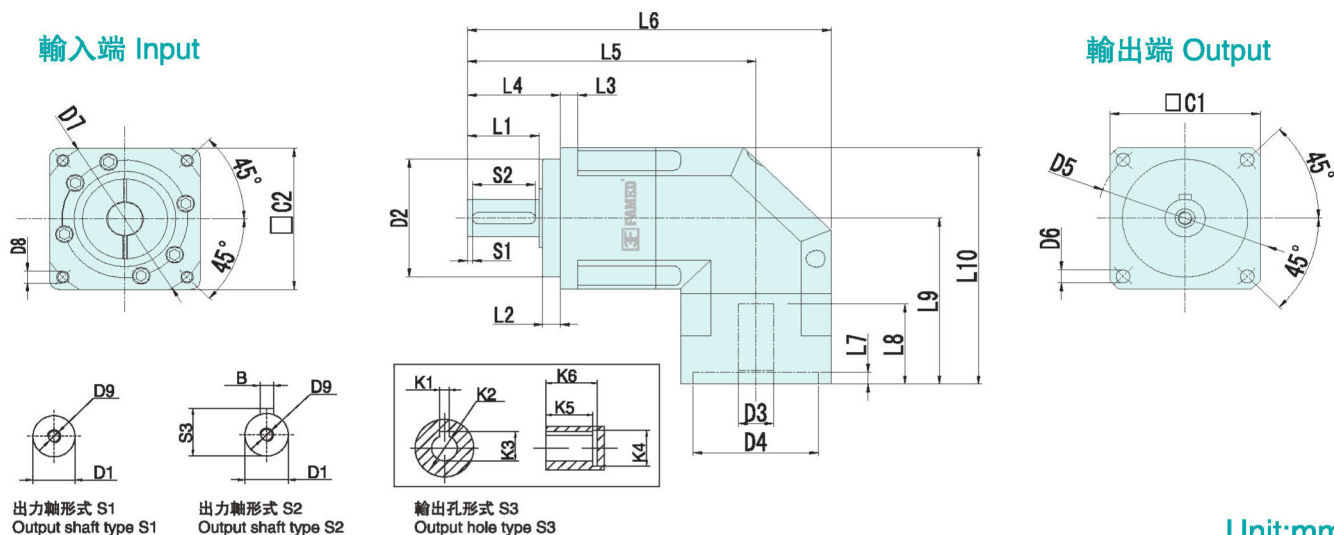
MODEL: PAR

單段 1-Stage

速比 Ratio: 3, 4, 5, 6, 7, 8, 9, 10, 14, 16, 20



外形尺寸圖 Dimensions:



Unit:mm

尺寸 Size	PAR042-L1	PAR060-L1	PAR090-L1	PAR115-L1	PAR142-L1	PAR180-L1	PAR220-L1
D1	φ 13	φ 16	φ 22	φ 32	φ 40	φ 55	φ 75
D2	φ 35	φ 50	φ 80	φ 110	φ 130	φ 160	φ 180
D3	φ 8(≤11)	φ 14(≤14)	φ 19(≤24)	φ 24(≤32)	φ 35(≤42)	φ 38(≤50)	φ 55(≤55)
D4	φ 30(30-50)	φ 50(30-70)	φ 70(50-110)	φ 110(50-130)	φ 114.3(95-180)	φ 180(95-180)	φ 215(180-255)
D5	φ 50	φ 70	φ 100	φ 130	φ 165	φ 215	φ 250
D6	4-φ 3.4	4-φ 5.5	4-φ 6.6	4-φ 9	4-φ 11	4-φ 13	4-φ 17
D7	φ 46(22-70)	φ 70(45-90)	φ 90(70-145)	φ 145(70-145)	φ 200(90-215)	φ 200(90-300)	φ 235(200-300)
D8	(4-M3X8L)	(4-M5X10L)	(4-M6X12L)	(4-M8X25L)	(4-M12X30L)	(4-M12X30L)	(4-M12X30L)
D9	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2.0P	M20X2.5P	M20X2.5P
L1	19	28.5	36.5	51	79	82	105
L2	5.5	7	10	12	15	20	30
L3	4	6	8	10	12	15	20
L4	26	37	48	65	97	105	138
L5	96	117	175	227	255	289	346
L6	(122)	(154)	(223)	(292)	(352)	(394)	(484)
L7	(3.5)	(5)	(5)	(11)	(14)	(15)	(7)
L8	(30)	(34)	(44)	(60)	(81)	(85)	(85)
L9	(69.5)	(81.5)	(107.5)	(134)	(165)	(213.5)	(268.5)
L10	(95.5)	(110.5)	(158)	(199)	(230)	(303.5)	(378.5)
C1	□42	□60	□90	□115	□142	□180	□220
C2	(□42)	(□60)	(□90)	(□130)	(□142)	(□180)	(□220)
S1	2	2	2	5	5	5	7
S2	16	25	32	40	65	70	90
S3	15	18	24.5	35	43	59	79
B	5	5	6	10	12	16	20
K1	-	4	6	8	10	14	16
K2	-	φ 11	φ 22	φ 28	φ 38	φ 50	φ 60
K3	-	12.7	25	31.3	42	53.8	64.4
K4	-	φ 16	φ 32	φ 38	φ 48	φ 60	φ 72
K5	-	15	20	27	35	43	60
K6	-	18	24	32	40	50	65

注1: () 括號內為可選擇範圍尺寸, () 括號外為標準尺寸。

注2: 減速機出力軸可以為客戶定制大小和長短。

注3: 輸入尺寸依據各品牌伺服馬達或步進馬達可以有所變動。

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.

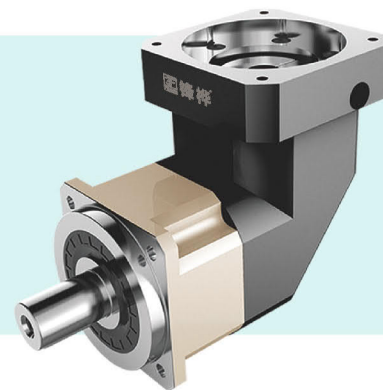
Note 2: The reducer output shaft size and length can be customized for customers.

Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

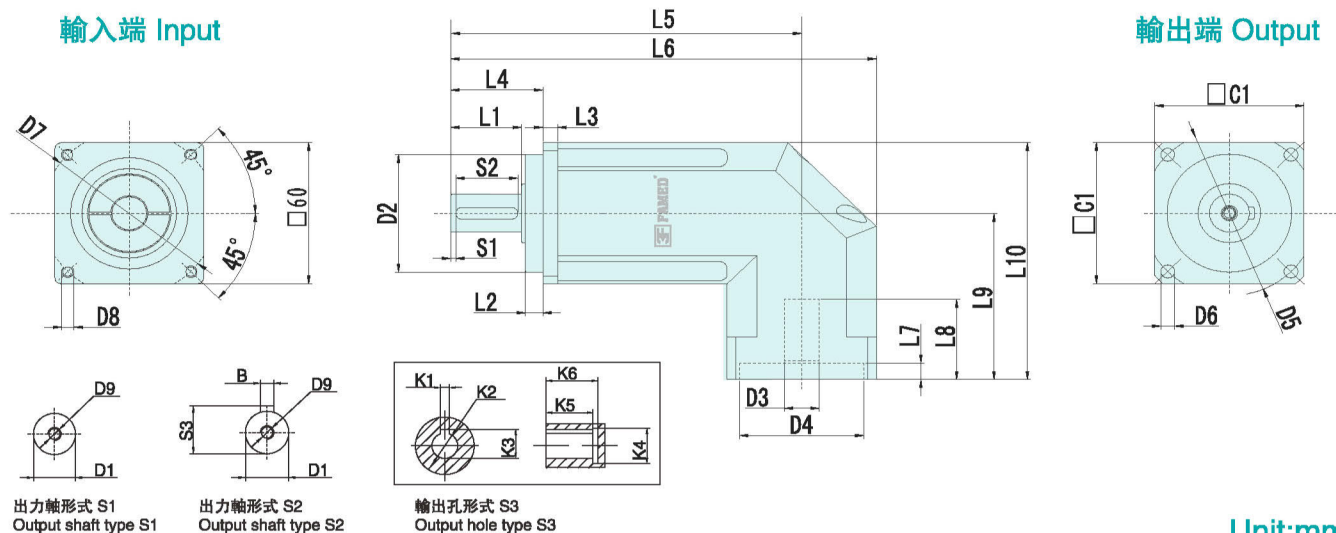
MODEL: PAR

雙段 2-Stage

速比 Ratio: 15, 20, 25, 30, 35, 40, 50, 70, 80,
100, 120, 140, 160, 180, 200



外形尺寸圖 Dimensions:



Unit:mm

尺寸 Size	PAR042-L2	PAR060-L2	PAR090-L2	PAR115-L2	PAR142-L2	PAR180-L2	PAR220-L2
D1	φ 13	φ 16	φ 22	φ 32	φ 40	φ 55	φ 75
D2	φ 35	φ 50	φ 80	φ 110	φ 130	φ 160	φ 180
D3	φ 8(≤11)	φ 14(≤14)	φ 14	φ 24(≤32)	φ 35(≤42)	φ 38(≤50)	φ 55(≤55)
D4	φ 30(30-50)	φ 50(30-70)	φ 50	φ 110(50-130)	φ 114.3(95-180)	φ 180(95-180)	φ 215(180-255)
D5	φ 50	φ 70	φ 100	φ 130	φ 165	φ 215	φ 250
D6	4-φ 3.4	4-φ 5.5	4-φ 6.6	4-φ 9	4-φ 11	4-φ 13	4-φ 17
D7	φ 46(22-70)	φ 70(45-90)	φ 70	φ 145(70-145)	φ 200(90-215)	φ 200(90-300)	φ 235(200-300)
D8	(4-M3X8L)	(4-M5X10L)	(4-M5X12L)	(4-M8X25L)	(4-M12X30L)	(4-M12X30L)	(4-M12X30L)
D9	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2.0P	M20X2.5P	M20X2.5P
L1	19	28.5	36.5	51	79	82	105
L2	5.5	7	10	12	15	20	30
L3	4	6	8	10	12	15	20
L4	26	37	48	65	97	105	138
L5	113	134	157	224	282	322	383
L6	139	171	205	(292)	(378)	(427)	(521)
L7	(3.5)	(5)	(5)	(11)	(14)	(15)	(7)
L8	(30)	(34)	(44)	(60)	(81)	(85)	(85)
L9	(69.5)	(81.5)	(107.5)	(134)	(165)	(213.5)	(268.5)
L10	(90.5)	(111.5)	(152.5)	(191.5)	(236)	(303.5)	(378.5)
C1	□42	□60	□90	□115	□142	□180	□220
C2	(□42)	(□60)	(□90)	(□130)	(□142)	(□180)	(□220)
S1	2	2	2	5	5	5	7
S2	16	25	32	40	65	70	90
S3	15	18	24.5	35	43	59	79
B	5	5	6	10	12	16	20
K1	-	4	6	8	10	14	16
K2	-	φ 11	φ 22	φ 28	φ 38	φ 50	φ 60
K3	-	12.7	25	31.3	42	53.8	64.4
K4	-	φ 16	φ 32	φ 38	φ 48	φ 60	φ 72
K5	-	15	20	27	35	43	60
K6	-	18	24	32	40	50	65

注1: () 括號內為可選擇範圍尺寸, () 括號外為標準尺寸。

注2: 減速機出力軸可以為客戶定制大小和長短。

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Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.

Note 2: The reducer output shaft size and length can be customized for customers.

Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.