

P系列

泛用經濟型減速機

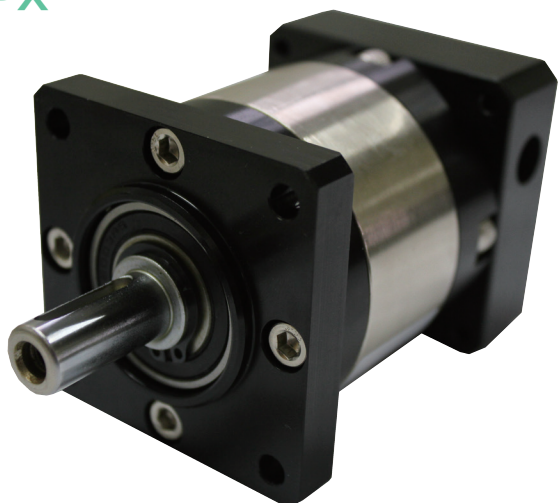
Cost Effective, Universal Use Planetary Gearbox

- 一段背隙：12-17 弧分
- 減數比：3-100
- 一段負載時效率達 94%
- 1 Stage-Minimal backlash: 12-17 arc-min
- Ratio: 3-100
- 1 Stage-High efficiency: 94%

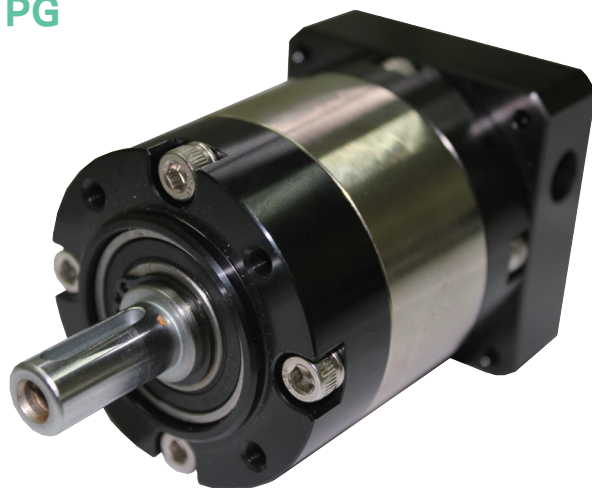
機型代碼

P SERIES ORDERING CODE

PF/PX



PG



PG/PF/PX 60 - L1 - 10 - Motor

型號 Model
PG/PF/PX60
PG/PF/PX90
PG/PF/PX120

段數 Stage
L1: (Ratio 3-10)
L2: (Ratio 9-100)
L3: (Ratio 120-1000)

馬達 Motor
馬達廠牌、型號 Motor Brand & Model

減速比 Ratio
請參閱目錄第 34 頁，減速比組成表。 Please refer to page 34 " Ratio Composition Table".

容許徑向力：垂直於軸心的力量

容許軸向力：平行於軸心的力量

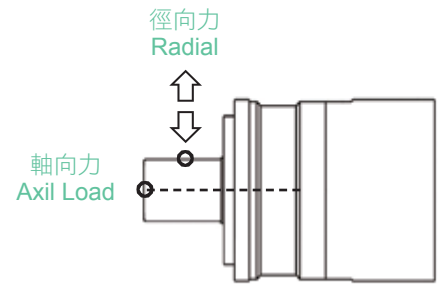
容許徑和容許軸向力與減速機的出力軸轉速及施力點的距離相關。

轉速越快，容許徑向力會降低。

負載的距離越遠，容許的徑向力也隨之降低。

* Permitted Radial Load :The force exerts perpendicular to output shaft

* Permitted Axial Load :The force exerts parallel to output shaft

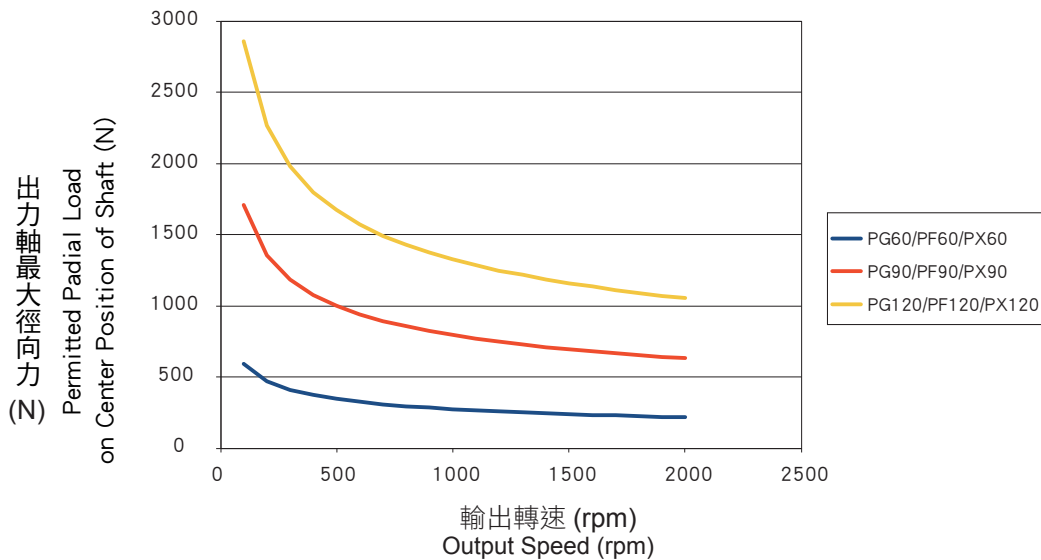


The radial & axial loads are related to the speed and application point on output shaft.

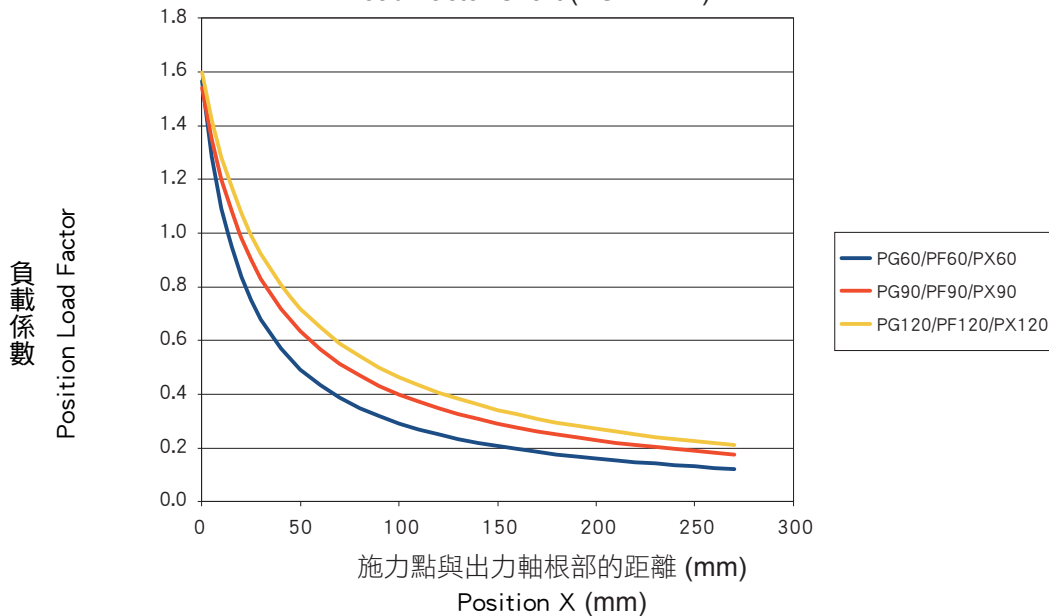
The radial & axial loads are decreased when the output shaft runs faster.

The radial & axial loads are decreased when the application points away from root segment of shaft.

徑向負荷表
Radial Load Chart (PG/PF/PX)



負載係數表
Load Factor Chart (PG/PF/PX)



馬達功率、減速比選用

SELECTION REFERENCE TABLE & RATIO SELECTION TABLE

P系列 減速機選用參考表(依據伺服馬達輸出功率選擇) P Series Selection Reference (Based on The Motor Output Torque)																					
馬達功率 Motor Output Power	減速機型號 Model	比數 Ratio																			
		1/3	1/4	1/5	1/7	1/9	1/10	1/12	1/15	1/16	1/20	1/21	1/25	1/28	1/30	1/35	1/40	1/49	1/50	1/70	1/100
100W	PG/PF/PX60	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
200W	PG/PF/PX60	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
400W	PG/PF/PX60	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	PG/PF/PX90	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
500W	PG/PF/PX90	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	PG/PF/PX120	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
750W	PG/PF/PX90	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	PG/PF/PX120	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1.0KW	PG/PF/PX120	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1.5KW	PG/PF/PX120	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

備註：

1. 可以依馬達輸出功率選用該比數有 '●' 記號之減速機型號。
2. 當應用於扭矩或慣性矩較大之場合，必須選用較大一級減速機。
3. 上表未列出之比數，如有需要請洽詢業務工程師。

Note :

1. By the motor output power, select the suitable gearbox models with '●' mark in above table.
2. When applied to a bigger torque or torsional rigidity mechanism, we suggest using a larger size gearbox.
3. Please contact us at vgm@vgmgear.com for ratios not being listed in above table.

P系列 比數組成 P Series Ratio Composition Table			
減速機型號 Model	減速機各段可選擇基本減速比數 Ratio Table of each Stage		
	一段式比數 Stage (L1)	二段式比數 Stage (L2)	三段式比數 Stage (L3)
PG60 PF60 PX60	3, 4, 5, 7, 10	9, 12, 15, 16, 20, 21, 25, 28, 30, 35, 40, 49, 50, 70, 100	
PG90 PF90 PX90	3, 4, 5, 7, 10	9, 12, 15, 16, 20, 21, 25, 28, 30, 35, 40, 49, 50, 70, 100	27, 36, 45, 48, 60, 75, 80, 90
PG120 PF120 PX120	3, 4, 5, 7, 10	9, 12, 15, 16, 20, 21, 25, 28, 30, 35, 40, 49, 50, 70, 100	27, 36, 45, 48, 60, 75, 80, 90

P 系列轉動慣量表						
	段數	比數	PG/PX/PF 60	PG/PX/PF 90	PG/PX/PF 120	
轉動慣量表 kg x cm ²	L1	3	0.05	1.01	2.31	
		4	0.05	0.9	1.91	
		5	0.05	0.88	1.86	
		6	—	—	—	
		7	0.05	0.86	1.8	
		8	—	—	—	
		9	—	—	—	
		10	0.05	0.86	1.78	
		L2	15	0.05	0.86	1.78
			20	0.05	0.86	1.78
	25		0.05	0.86	1.78	
	30		0.05	0.86	1.78	
	35		0.05	0.86	1.78	
	40		0.05	0.86	1.78	
	45		—	—	—	
	50		0.05	0.86	1.78	
	60		—	—	—	
	70		0.05	0.86	1.78	
	80	—	—	—		
	90	—	—	—		
100	0.05	0.86	1.78			

P Series Reducer Moment of Inertia Table						
	Stage	Ratio	PG/PX/PF 60	PG/PX/PF 90	PG/PX/PF 120	
Moment of inertia Table kg x cm ²	L1	3	0.05	1.01	2.31	
		4	0.05	0.9	1.91	
		5	0.05	0.88	1.86	
		6	—	—	—	
		7	0.05	0.86	1.8	
		8	—	—	—	
		9	—	—	—	
		10	0.05	0.86	1.78	
		L2	15	0.05	0.86	1.78
			20	0.05	0.86	1.78
	25		0.05	0.86	1.78	
	30		0.05	0.86	1.78	
	35		0.05	0.86	1.78	
	40		0.05	0.86	1.78	
	45		—	—	—	
	50		0.05	0.86	1.78	
	60		—	—	—	
	70		0.05	0.86	1.78	
	80	—	—	—		
	90	—	—	—		
100	0.05	0.86	1.78			

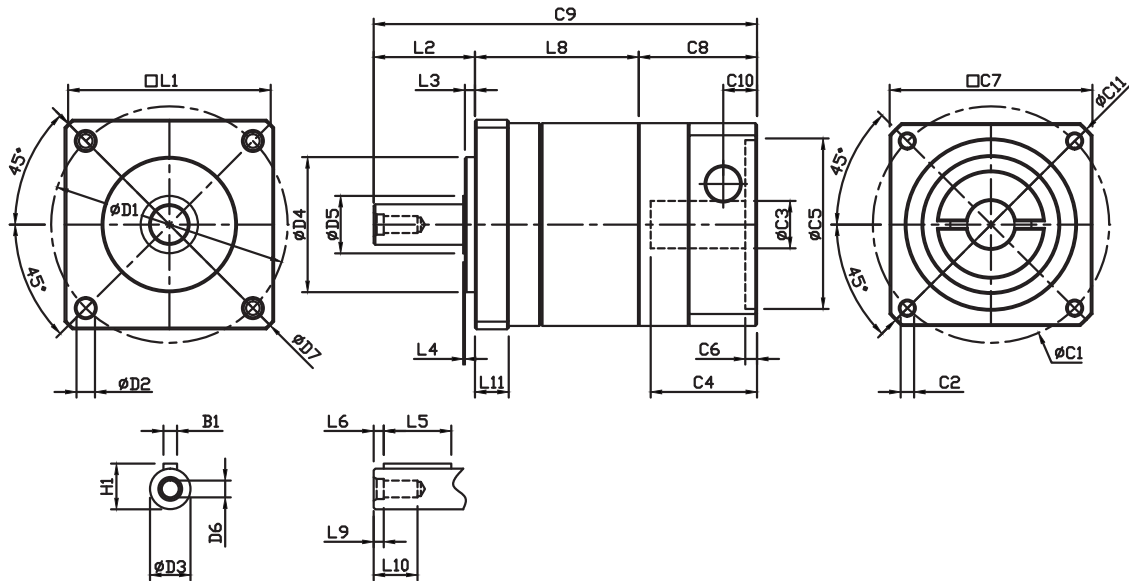
技術規格表

TECHNICAL SPECIFICATIONS TABLE

P系列 技術規格 Technical Specifications						
規格 Specification	單位 Unit	段數 Stage	比數 Ratio	PG60/PF60/PX60	PG90/PF90/PX90	PG120/PF120/PX120
額定輸出扭矩 T_{2N} Normal Output Torque	Nm	L1	3	15	79	190
			4	21	88	230
			5	20	85	215
			7	18	82	205
			10	15	79	190
		L2	9	15	79	190
			15	15	79	190
			20	21	88	230
			25	20	85	215
			35	20	85	215
			40	21	88	230
			49	18	82	205
		L3	70	18	82	205
			100	15	79	190
			27	—	88	230
			36	—	79	190
			45	—	79	190
			48	—	79	190
60	—	79	190			
75	—	79	190			
80	—	88	230			
急停扭矩 Emergency Stop Torque	Nm	L1, L2, L3	3-100	2.5倍額定輸出扭矩 2.5 Times of Nominal Output Torque		
額定輸入轉速 n_{IN} Normal Input Speed	rpm	L1, L2, L3	3-100	3,000	3,000	2,000
最大輸入轉速 n_{IB} Max. Input Speed	rpm	L1, L2, L3	3-100	4,500	4,500	3,000
標準背隙 Standard Backlash	arcmin	L1	3-10	≤15-20	≤12-17	≤12-17
		L2	9-100	≤17-22	≤15-20	≤15-20
扭轉剛性 Torsional Rigidity	Nm/arcmin	L1, L2, L3	3-100	2	7.2	14
容許徑向力 F_{ar} Max. Radial Load	N	L1, L2, L3	3-100	590	1,700	2,850
容許軸向力 F_{rB} Max. Axial Load	N	L1, L2, L3	3-100	325	840	1,470
平均使用壽命 Average Life Time	hr	L1, L2, L3	3-100	20,000		
全負載時效率 η Efficiency of Full Load	%	L1	3-10	≥ 94%		
		L2	9-100	≥ 91%		
		L3	27-100	≥ 86%		
淨重 Net Weight	kg	L1	3-10	1.1	3.6	8.6
		L2	9-100	1.4	5.4	10.9
		L3	27-100	—	7.3	13.2
使用溫度 Operating Temp	°C	L1, L2, L3	3-100	-10°C ~ +90°C		
潤滑 Lubrication		L1, L2, L3	3-100	全合成潤滑油脂 Lithium Complex Synthetic Lubrication		
安裝方向 Mounting Position		L1, L2, L3	3-100	任意方向 All Directions		
噪音值 Running Noise	dBA	L1, L2, L3	3-100	≤70	≤70	≤70

1. 上述單段減速機(未指定比數)相關規格，主要為使用各型號5比減速機所測得之數據。
2. 減速比：i = 輸入轉速/輸出轉速。
3. 背隙值：為在2%額定輸出扭矩下測試所得之數據。
4. 最大徑向力及最大軸向力：施力於出力軸中心位置，週期負載時間50%，轉速100rpm，條件下所測得之數據。
5. 運轉負載週期<60%狀況下，平均使用壽命如列表數據值；負載週期≥60%之連續運轉狀況下，平均使用壽命可能會降低至正常值的50%以下。
6. 噪音值：距離1公尺，空載運轉，額定輸入轉速，條件下所測得之數據。

1. Above relative specifications of each model most are measured on 5 : 1 gear ratio
2. Ratios : I = Nin / Nout
3. Backlash : Measured on 2% of nominal output torque
4. Max. Radial and Axial Load : Applied to the output shaft center, and 50% of duty time and at 100 rpm
5. Duty Cycle < 60%, Average Lifetime = List Value; Duty Cycle ≥ 60%, Average Lifetime < 50% List value
6. Noise Level : Numeric measured on idle running in 1m distance, and at nominal input speed



(單位：mm)
(Unit：mm)

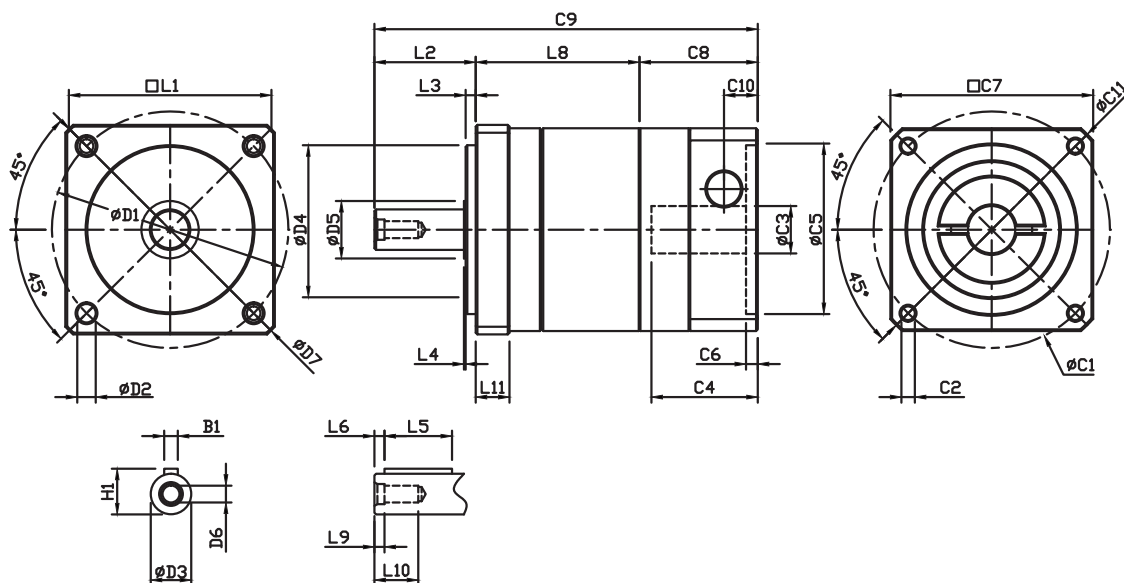
尺寸 Size	PF60	PF90	PF120
D1	70	105	145
D2	5.5	6.8	8.7
D3	12(14)	18(20)	32(24)
D4	40	80	80
D5	17	25	35
D6	M5×0.8P	M6×1P	M8×1.25P
D7	84.5	120	160
L1	62	95	120
L2	30(34)	57	70(60)
L3	3	15	10
L4	1	2	1
L5	20	25	40
L6	3	5	5
L8	一段 (stage 1)	48.5	56.5
	二段 (stage 2)	67	84
	三段 (stage 3)	—	111.5
L9	3	4	4
L10	14	18	20
L11	10	10	15
C1	70	100	145
C2	M5×0.8P(MAX)	M6×1P(MAX)	M8×1.25P(MAX)
C3	6-14	14-19	19-24
C4	31.5	43.5	61.5
C5	50	80	110
C6	3.5	8	7
C7	60	95	120
C8	35	56	72
C9	一段 (stage 1)	113.5(117.5)	169.5
	二段 (stage 2)	132(136)	197
	三段 (stage 3)	—	224.5
C10	10	18	30.5
C11	80	120	160
B1	4(5)	6	10(8)
H1	13.5(16)	20.5(22.5)	35(27)

* 註：C1-C6 為標準品最大尺寸，為公制標準馬達連接板尺寸，尺寸依搭配的馬達而改變。如超出尺寸屬特殊規格請與我司聯絡。

* Note : C1-C6 are metric standard specific dimensions of motor. Please contact us at vgm@vgmgear.com for other specification or customize product.

尺寸圖

DRAWING & DEMENSION



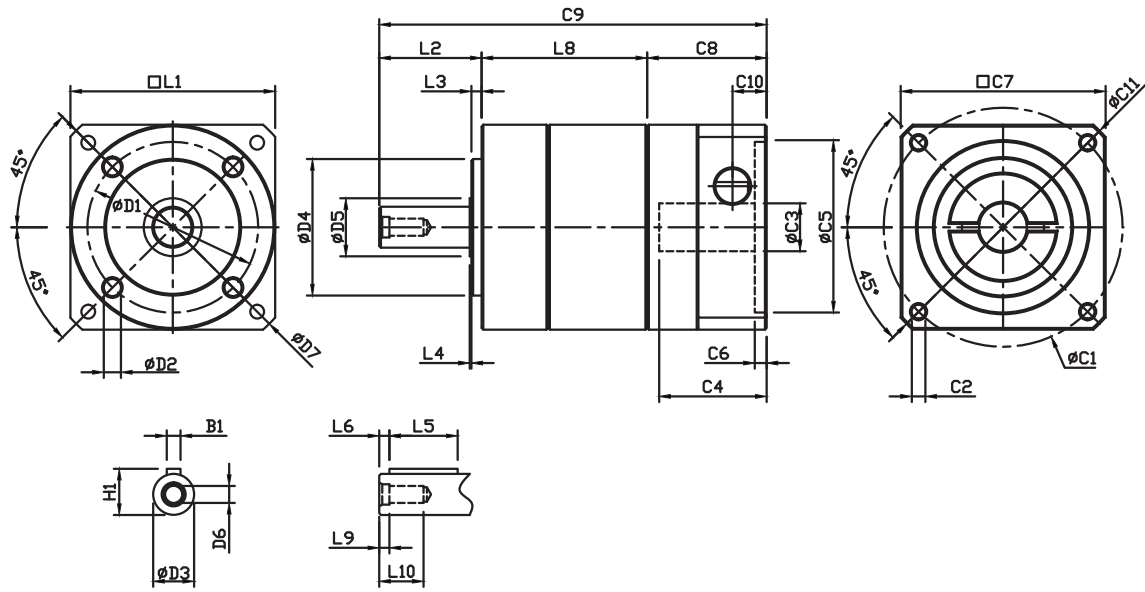
(單位：mm)
(Unit：mm)

尺寸 Size	PX60	PX90	PX120
D1	70	100	145
D2	5.5	6.8	8.7
D3	16(14)	22(20)	32(24)
D4	50	80	110
D5	17	25	35
D6	M5×0.8P	M6×1P	M8×1.25P
D7	84.5	120	160
L1	62	95	120
L2	34	47	70(60)
L3	3	5	10
L4	1	2	1
L5	20	25	40
L6	3	5	5
L8	一段 (stage 1)	48.5	80
	二段 (stage 2)	67	114
	三段 (stage 3)	—	148
L9	3	4	4
L10	14	18	20
L11	10	10	15
C1	70	100	145
C2	M5×0.8P(MAX)	M6×1P(MAX)	M8×1.25P(MAX)
C3	6-14	14-19	19-24
C4	31.5	43.5	61.5
C5	50	80	110
C6	3.5	8	7
C7	60	95	120
C8	35	56	72
C9	一段 (stage 1)	117.5	222(212)
	二段 (stage 2)	136	256(246)
	三段 (stage 3)	—	290(280)
C10	10	18	30.5
C11	80	120	160
B1	5	6	10(8)
H1	18(16)	24.5(22.5)	35(27)

* 註：C1-C6 為標準品最大尺寸，為公制標準馬達連接板尺寸，尺寸依搭配的馬達而改變。如超出尺寸屬特殊規格請與我司聯絡。

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尺寸圖 DRAWING & DEMENSION



(單位：mm)
(Unit：mm)

尺寸 Size	PG60	PG90	PG120
D1	50	70	100
D2	M5	M6	M10
D3	12(14)	18(20)	32(24)
D4	40	60	80
D5	17	25	35
D6	M5×0.8P	M6×1P	M8×1.25P
L1	60	95	120
L2	30(34)	47	70(60)
L3	3	5	10
L4	1	2	1
L5	20	25	40
L6	3	5	5
L8	一段 (stage 1)	48.5	80
	二段 (stage 2)	67	114
	三段 (stage 3)	—	121.5
L9	3	4	4
L10	14	18	20
C1	70	100	145
C2	M5×0.8P(MAX)	M6×1P(MAX)	M8×1.25P(MAX)
C3	6-14	14-19	19-24
C4	31.5	43.5	61.5
C5	50	80	110
C6	3.5	8	7
C7	60	95	120
C8	35	56	72
C9	一段 (stage 1)	113.5(117.5)	222(212)
	二段 (stage 2)	132(136)	256(246)
	三段 (stage 3)	—	224.5
C10	10	18	30.5
C11	80	120	160
B1	4(5)	6	10(8)
H1	13.5(16)	20.5(22.5)	35(27)

* 註：C1-C6 為標準品最大尺寸，為公制標準馬達連接板尺寸，尺寸依搭配的馬達而改變。如超出尺寸屬特殊規格請與我司聯絡。

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