

轉角精密型行星減速機

Precision Right Angle Planetary Gearbox

FBR



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

使用整體式滾珠軸承，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.維護方便

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 ball 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.

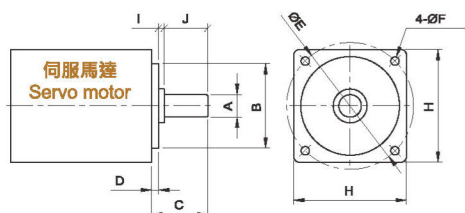
減速機的選型 Model Selection of Speed Reducers

FBR 系列 Type

FBR090	—	10	—	S1	—	P1	/	馬達
減速機型式 Reducer Model FBR040, FBR060, FBR090 FBR120, FBR160		出力軸鍵槽 Output Shaft Keyway 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		馬達型號 Motor Model 馬達製造商及型號 Motor Manufacturer & Model				
減速比 Ratio 單節 1-stage: 3,4,5,6,7,8,9,10 雙節 2-stage: 12,15,16,20,25,28,30,35,40,50,70,80,100 叁節 3-stage: 60,64,72,80,90,100,120,144,150,160,180,200 240,258,288,320,384,512,600,800,1000		背隙等級 Backlash Grade 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
行星減速機訂購編號								
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.			

FBR 減速機性能資料 Reducer Specifications

規格 Specs	單位 Unit	節數 Stage	減速比 Ratio	FBR040	FBR060	FBR090	FBR120	FBR160
額定輸出力矩 T_{2N} Rated Output Torque	Nm	1	3	25	60	135	213	347
			4	24	55	145	295	547
			5	27	65	165	335	655
			7	24	55	145	305	555
			10	19	65	160	335	655
		2	15	25	55	135	213	347
			20	24	55	145	295	547
			25	27	65	165	335	655
			30	27	60	135	213	347
			35	27	65	165	335	655
			40	27	55	145	295	547
			50	25	65	165	335	655
			70	24	65	165	335	655
			100	19	65	165	335	655
最大輸出扭矩 T_{2NOT}^1 / Max. Output Torque	Nm	1,2	3~100	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	3~100	3000	3000	3000	3000	2500
最大輸入轉速 n_{1a} / Max. Input Speed	rpm	1,2	3~100	5000	5000	5000	5000	3600
精密背隙 P1 / Precision Backlash P1	arcmin	1	3~10	≤8	≤8	≤8	≤8	≤8
		2	12~100	≤10	≤10	≤10	≤10	≤10
標準背隙 P2 / Standard Backlash P2	arcmin	1	3~10	≤11	≤11	≤11	≤11	≤11
		2	12~100	≤13	≤13	≤13	≤13	≤13
扭轉剛性 / Torsional Rigidity	Nm/arcmin	1,2	3~100	3	6	12	22	50
容許徑向力 F_{2r}^2 / Max. Radial Force	N	1,2	3~100	320	460	1300	3200	6520
容許軸向力 F_{2a1}^2 / Max. Axial Force	N	1,2	3~100	160	230	660	1600	3260
使用壽命 / Service Life	hr	1,2	3~100	20000 h				
效率 η / Efficiency	%	1	3~10	≥97%				
		2	15~100	≥94%				
重量 / Weight	kg	1	3~10	0.73	0.99	2.1	4.98	18.2
		2	15~100	1.05	1.46	3.2	6.92	24.9
使用溫度 / Operating Temperature	℃	1,2	3~100	-25℃~+90℃				
潤滑 / Lubrication		1,2	3~100	全合成潤滑油脂 Synthetic Grease				
防護等級 / Protection Class		1,2	3~100	IP65				
安裝方向 / Mounting Position		1,2	3~100	任意方向 Any Direction				
噪音值 ($n_1=3000\text{rpm}$, 無負載) / Noise Level	dB(A)	1,2	3~100	≤62	≤63	≤65	≤67	≤68

減速機轉動慣量 Reducer Rotary Inertia

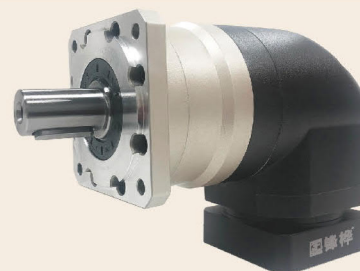
規格 Specs	單位 Unit	節數 Stage	減速比 Ratio	FBR040	FBR060	FBR090	FBR120	FBR160
轉動慣量 J_1 Moment of Inertia	kg.cm ²	1	3	0.03	0.16	0.61	3.25	9.21
			4	0.03	0.14	0.48	2.74	7.54
			5	0.03	0.13	0.47	2.71	7.42
			7	0.03	0.13	0.45	2.65	7.25
			10	0.03	0.13	0.45	2.62	7.14
		2	12~40	0.03	0.13	0.44	2.58	7.07
			50~100	0.03	0.13	0.44	2.57	7.04

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, acting 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: FBR

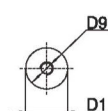
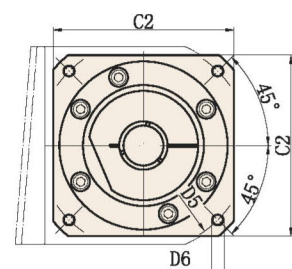
單段 1-Stage

速比 Ratio: 3, 4, 5, 6, 7, 8, 9, 10

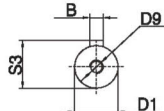


外形尺寸圖 Dimensions:

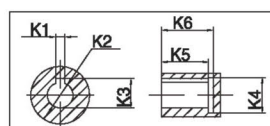
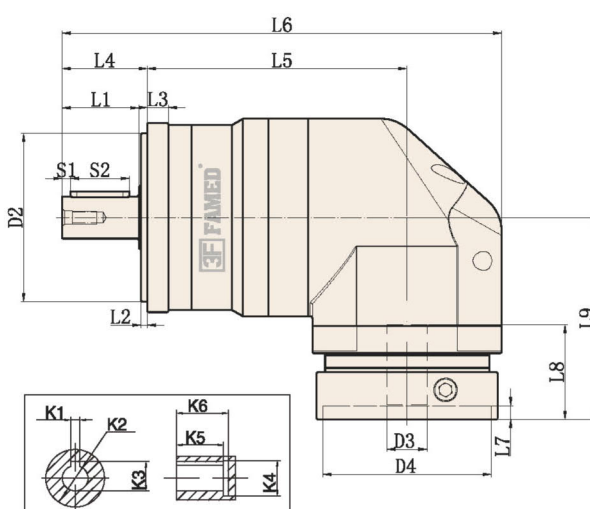
輸入端 Input



出力軸形式 S1
Output shaft type S1

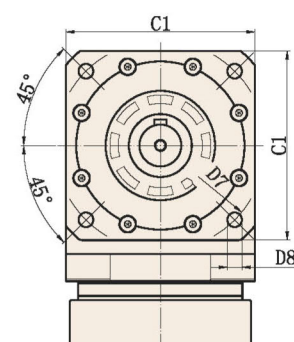


出力軸形式 S2
Output shaft type S2



輸出孔形式 S3
Output hole type S3

輸出端 Output



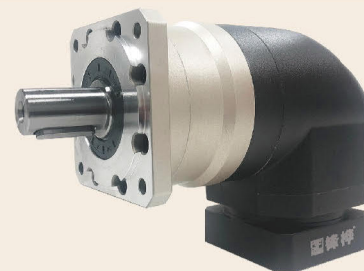
Unit:mm

尺寸 Size	FBR060-L1	FBR090-L1	FBR120-L1	FBR160-L1
D1	φ 14	φ 20 (22)	φ 25	φ 40
D2	φ 50	φ 80	φ 110	φ 130
D3	φ 14(6.35-19)	φ 19 (φ 11-24)	φ 22(16-24)	φ 35 (φ 22-38)
D4	φ 50 (50-70)	φ 80 (50-110)	φ 80 (50-110)	φ 114.3 (φ 110-114.3)
D5	φ 70 (70-130)	φ 100 (70-145)	φ 145 (90-155)	φ 200 (φ 145-200)
D6	(4-M4*10L)	(4-M6*14L)	(4-M8*20L)	4-M12 (M8-M12)
D7	φ 70	φ 100	φ 130	φ 185
D8	4-φ 5.5	4-φ 7	4-φ 9	4-φ 11
D9	M5*0.8P*15L	M6*1.0P*16.5L	M10*1.5P*23L	M16X2P
L1	28.5	36.5	50	87
L2	3	3	4	78
L3	8	10	15	5
L4	33	40.5	55	20
L5	90	123.5	146.5	111
L6	153	209	259	295
L7	(5)	(6.5)	(10)	5 (5-7)
L8	(33)	(45)	(64)	86 (62-86)
L9	(77.5)	(96)	(135.5)	165.5 (165.5-189.5)
C1	□62	□90	□120	□160
C2	(□60)	(□86)	(□130)	□175 (142)
S1	3	4	5	5
S2	22	28	40	70
S3	16	22.5	28	43
B	5	6	8	12
K1	3	6	8	10
K2	φ 8	φ 18	φ 28	φ 38
K3	9.2	21	31.3	41.3
K4	φ 11	φ 24	φ 38	φ 48
K5	20	30	27	35
K6	24	35	32	40

MODEL: FBR

雙段 2-Stage

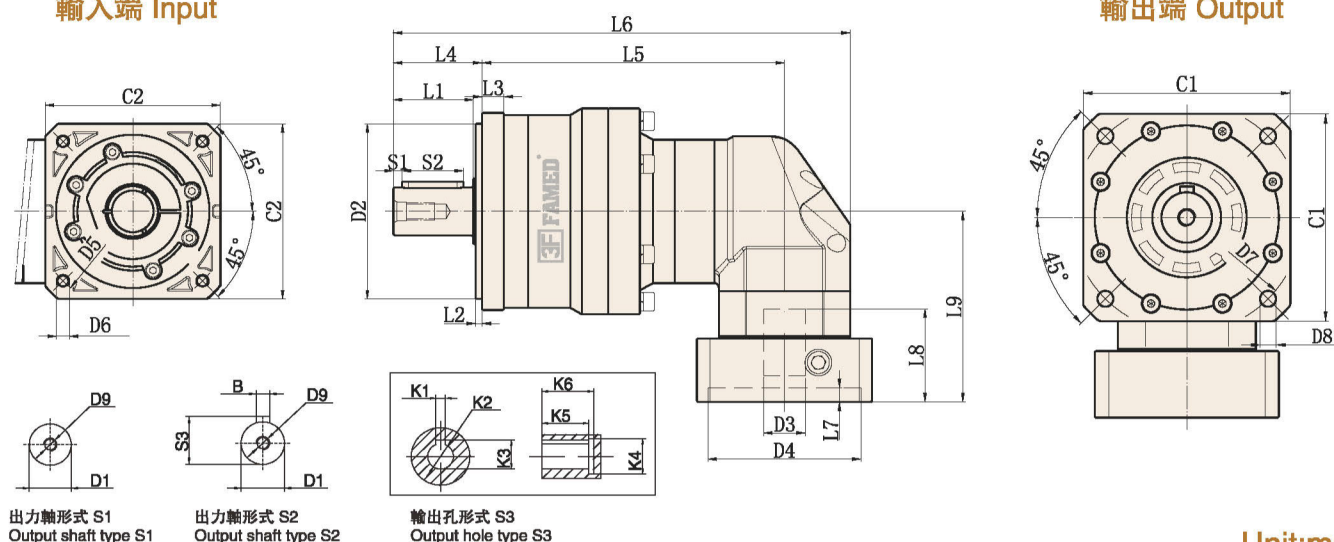
速比 Ratio: 12, 15, 16, 20, 25, 28, 30, 35, 40, 50
70, 80, 100



外形尺寸圖 Dimensions:

輸入端 Input

輸出端 Output



Unit:mm

尺寸 Size	FBR060-L2	FBR090-L2	FBR120-L2	FBR160-L2
D1	φ 14	φ 20 (22)	φ 25 (32)	φ 40
D2	φ 50	φ 80	φ 110	φ 130
D3	φ 19(6.35-19)	φ 19 (φ 11-24)	φ 22 (φ 16-24)	φ 35 (φ 22-38)
D4	φ 70 (50-70)	φ 70 (50-110)	φ 110 (φ 55.5-110)	φ 114.3 (φ 110-114.3)
D5	φ 90 (70-130)	φ 90 (70-145)	φ 145 (φ 90-155)	φ 200 (φ 145-200)
D6	(4-M4*10L)	(4-M6*14L)	4-M8 (M6-M12)	4-M12 (M8-M12)
D7	φ 70	φ 100	φ 130	φ 185
D8	4-φ 5.5	4-φ 7	4-φ 8.5	4-φ 11
D9	M5*0.8P*15L	M6*1.0P*16.5L	M10X1.5P	M16X2P
L1	28.5	36.5	55	87
L2	3	3	49	78
L3	8	10	4	5
L4	33	40.5	15	20
L5	119	138	110	149
L6	182	208.5	303	333
L7	(6.5)	(6.5)	8(5-8)	5 (5-7)
L8	(42.5)	(42.5)	70 (59-70)	86 (62-86)
L9	(87)	(87)	130 (119-130)	165.5 (165.5-189.5)
C1	□62	□90	□120	□160
C2	(□80)	(□86)	130 (120)	175 (142)
S1	3	4	5	5
S2	22	28	40	70
S3	16	22.5	28	43
B	5	6	8	12
K1	3	6	8	10
K2	φ 8	φ 18	φ 28	φ 38
K3	9.2	21	31.3	41.3
K4	φ 11	φ 24	φ 38	φ 48
K5	20	30	27	35
K6	24	35	32	40