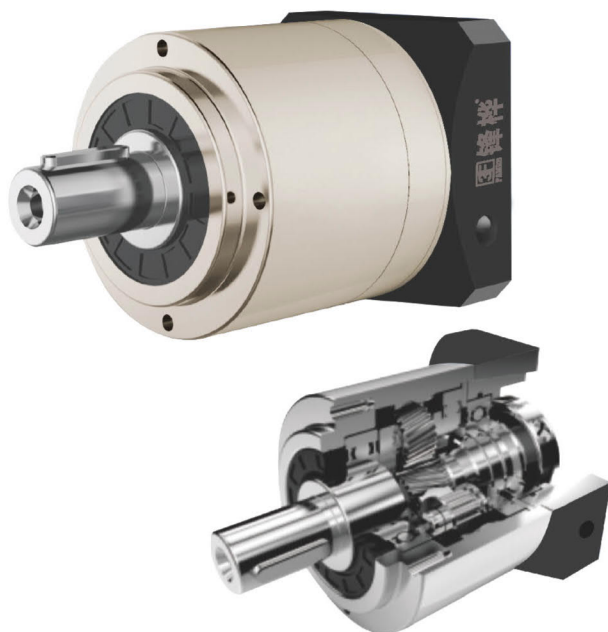


高精密型行星減速機

PRECISION PLANETARY GEARBOX

VRL



1. 靜音

使用斜齒輪實現順暢安靜的運轉

2. 高精度

背隙低於3弧分、定位精確。

3. 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。

4. 法蘭、連接器方式

可以安裝到馬達上。

5. 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。

6. 維護方便

在產品壽命期內無需更換潤滑脂，安裝更便捷。

1. Quiet operation

Helical gears are used to achieve smooth and quiet operation.

2. High precision

The backlash is less than 3 arcmin and the positioning is accurate.

3. High rigidity & torque The use of integral ball bearings greatly improves the rigidity and torque.

4. Methods of flange and connector

It can be installed on any motor in the world.

5. No grease leakage

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

6. Convenient maintenance

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

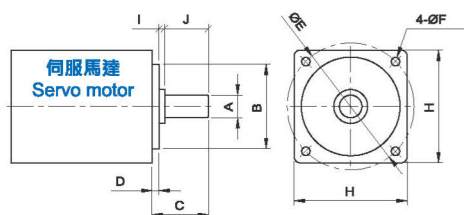
減速機的選型 Model Selection of Speed Reducers

VRL 系列 Type

VRL090	—	10	—	S1	—	P1	/	馬達
減速機型式 Reducer Model VRL050, VRL070, VRL090, VRL120 VRL155, VRL205, VRL235			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: 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100				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.	

VRL 減速機性能資料 Reducer Specifications

規格 Specs	單位 Unit	節數 Stage	減速比 Ratio	VRL050	VRL070	VRL090	VRL120	VRL155	VRL205	VRL235
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	45	120	260	500	1000	1600
			9	14	40	100	230	450	900	1500
			10	14	40	100	230	450	900	1500
		2	15	20	55	130	208	342	588	1140
			20	19	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	298	542	1050	1700
			45	14	40	100	230	450	900	1500
			50	22	60	160	330	650	1200	2000
			60	20	55	150	310	600	1100	1900
			70	19	50	140	300	550	1100	1800
			80	17	45	120	260	500	1000	1600
			90	14	40	100	230	450	900	1500
			100	14	40	100	230	450	900	1500
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	5000	5000	4000	4000	3000	3000	2000
最大輸入轉速 n_{1B} / Max. Input Speed	rpm	1,2	3~100	10000	10000	8000	8000	6000	6000	4000
超精密背隙 P_0 / Micro Backlash P_0	arcmin	1	3~10	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
		2	15~100	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
精密背隙 P_1 / Precision Backlash P_1	arcmin	1	3~10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
		2	15~100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
精密背隙 P_2 / Precision Backlash P_2	arcmin	1	3~10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
		2	15~100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
扭轉剛性 / Torsional Rigidity	Nm/arcmin	1,2	3~100	3	7	14	25	50	145	225
容許徑向力 F_{rE}^2 / Max. Radial Force	N	1,2	3~100	680	1260	2880	6000	8200	12800	27800
容許軸向力 F_{a1B}^2 / Max. Axial Force	N	1,2	3~100	370	760	1580	3360	4660	7250	18500
使用壽命 / Service Life	hr	1,2	3~100	20000h						
效率 η / Efficiency	%	1	3~10	$\geq 97\%$						
		2	15~100	$\geq 94\%$						
重量 / Weight	kg	1	3~10	0.5	1.2	3.5	7.8	14.5	30	50
		2	15~100	0.8	1.4	4.1	9	17.5	33	63
使用溫度 / Operating Temperature	℃	1,2	3~100	(-15℃ ~ +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	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70

減速機轉動慣量 Reducer Rotary Inertia

規格 Specs	單位 Unit	節數 Stage	減速比 Ratio	VRL050	VRL070	VRL090	VRL120	VRL155	VRL205	VRL235
轉動慣量 J_1 Moment of Inertia	kg.cm ²	1	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
		2	12~40	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			50~100	0.03	0.03	0.13	0.44	2.57	7.03	22.51

1. 減速比 ($i=N_{in}/N_{out}$) 2. 輸出轉數 100rpm 時，作用於輸出軸中心位置。 3. 最大加速力矩 $T_{2B}=60\%$ of T_{2NOT} ，連續連轉使用壽命為 10000hrs。
1. Ratio ($i=N_{in}/N_{out}$) 2. Output revolutions 100rpm, acting on the output shaft center position.
3. The Max. acceleration torque $T_{2B}=60\%$ of T_{2NOT} , continuous operation, service life is 10000hrs.

MODEL: VRL

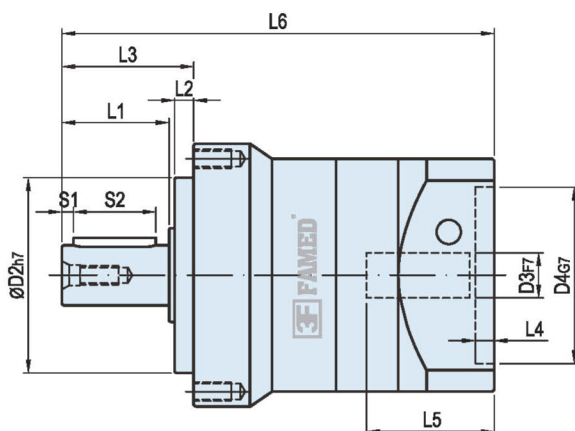
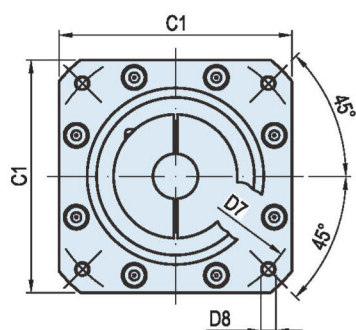
單段 1-Stage

速比 Ratio: 3, 4, 5, 6, 7, 8, 9, 10

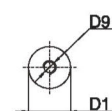
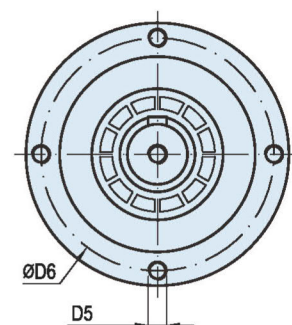


外形尺寸圖 Dimensions:

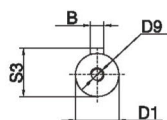
輸入端 Input



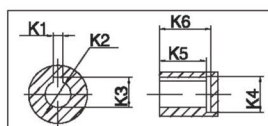
輸出端 Output



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

Unit:mm

尺寸 Size	VRL070-L1	VRL090-L1	VRL120-L1	VRL155-L1	VRL205-L1	VRL235-L1
D1	φ 16	φ 22	φ 32	φ 40	φ 55	φ 75
D2	φ 52	φ 68	φ 90	φ 120	φ 160	φ 180
D3	φ 14 (φ 11-14)	φ 19 (φ 16-24)	φ 22 (φ 19-35)	φ 24 (φ 22-35)	φ 35 (φ 35-φ 42)	φ 42 (φ 35-55)
D4	φ 50 (φ 50-70)	φ 70 (φ 70-φ 110)	φ 110 (φ 114.3)	φ 110 (φ 114.3)	φ 114.3 (φ 114.3-200)	φ 180 (φ 114.3-200)
D5	4-M5X10L	4-M6X12L	4-M8X16L	4-M10X20L	4-M12X22L	4-M16X28L
D6	φ 62	φ 80	φ 108	φ 140	φ 184	φ 210
D7	φ 70 (φ 70-90)	φ 90 (φ 90-145)	φ 145 (φ 145-200)	φ 145 (φ 145-200)	φ 200 (φ 200-235)	φ 215 (φ 200-235)
D8	4-M5 (M4-M6)	4-M6 (M5-M8)	4-M8 (M8-M12)	4-M8 (M8-M12)	4-M12	4-M12
D9	M5X0.8P	M8X1.25P	M12X1.75P	M16X2P	M20X2.5P	M20X2.5P
L1	28.5	36.5	51	79	82	105
L2	5	6	9	12	15	18
L3	35	44	62	94	100	126
L4	5	7-8	6-11	8-11	7-10	8-15
L5	34 (≤44)	44 (≤60)	64.5 (≤81.5)	72.5 (≤82)	85 (≤120)	109 (≤119)
L6	115 (115-125)	146 (146-162)	201 (201-218)	251.5 (251.5-261)	284 (284-319)	358 (358-368)
C1	65 (65-80)	90 (90-130)	130 (130-180)	150 (150-180)	180 (180-220)	200 (200-220)
S1	3	4	5	5	6	7
S2	22	28	40	65	70	90
S3	18	24.5	35	43	59	79.5
B	5	6	10	12	16	20
K1	4	6	8	10	14	18
K2	φ 11	φ 22	φ 28	φ 38	φ 50	φ 60
K3	12.8	24.5	31.3	41.3	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: VRL

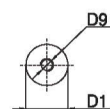
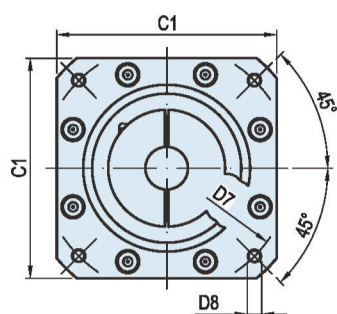
雙段 2-Stage

速比 Ratio: 15, 20, 25, 30, 35, 40, 45, 50,
60, 70, 80, 90, 100

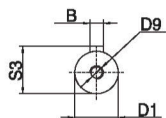


外形尺寸圖 Dimensions:

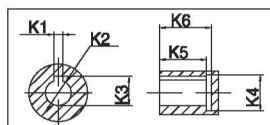
輸入端 Input



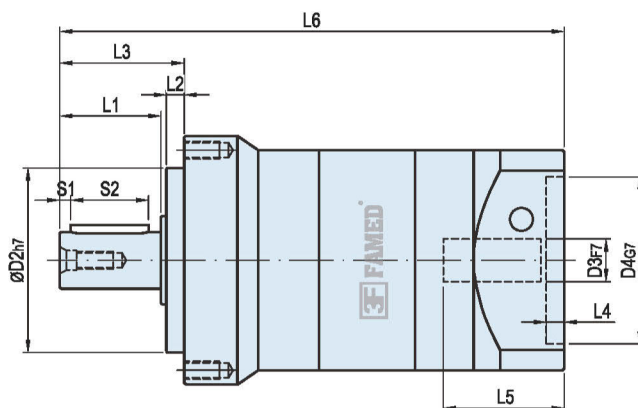
出力軸形式 S1
Output shaft type S1



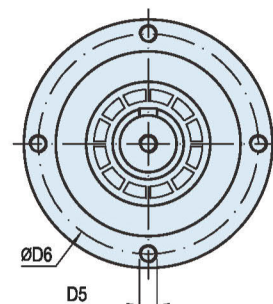
出力軸形式 S2
Output shaft type S2



輸出孔形式 S3
Output hole type S3



輸出端 Output



Unit:mm

尺寸 Size	VRL070-L1	VRL090-L2	VRL120-L2	VRL155-L2	VRL205-L2	VRL235-L2
D1	φ 16	φ 22	φ 32	φ 40	φ 55	φ 75
D2	φ 52	φ 68	φ 90	φ 120	φ 160	φ 180
D3	φ 14 (φ 11-14)	φ 19 (φ 11-19)	φ 22 (φ 16-24)	φ 24 (φ 19-35)	φ 35 (φ 22-35)	φ 42 (φ 35-42)
D4	φ 50	φ 70 (φ 50-φ 80)	φ 110 (φ 70-φ 110)	φ 110 (φ 114.3)	φ 110 (φ 114.3)	φ 180 (φ 114.3-200)
D5	4-M5X10L	4-M6X12L	4-M8X16L	4-M10X20L	4-M12X22L	4-M16X28L
D6	φ 62	φ 80	φ 108	φ 140	φ 184	φ 210
D7	φ 70	φ 90 (φ 70-100)	φ 145 (φ 90-145)	φ 145 (φ 145-200)	φ 145 (φ 145-200)	φ 215 (φ 200-235)
D8	4-M5 (M4)	4-M6 (M4-M6)	4-M8 (M5-M8)	4-M8 (M8-M12)	4-M8 (M8-M12)	4-M12
D9	M5X0.8P	M8X1.25P	M12X1.75P	M16X2P	M20X2.5P	M20X2.5P
L1	28.5	36.5	51	79	82	105
L2	5	6	9	12	15	18
L3	35	44	62	94	100	126
L4	5	5	8 (7-8)	11 (6-11)	8 (8-11)	8 (7-10)
L5	34	34 (≤44)	44 (≤60)	64.5 (≤81.5)	72.5 (≤82)	85 (≤120)
L6	142	172.5 (162.5-172.5)	230.5 (214.5-230.5)	286 (286-303)	340 (330.5-340)	407 (402-437)
C1	65	80 (65-86)	130 (90-130)	130 (130-180)	150 (150-180)	200 (180-220)
S1	3	4	5	5	6	7
S2	22	28	40	65	70	90
S3	18	24.5	35	43	59	79.5
B	5	6	10	12	16	20
K1	4	6	8	10	14	18
K2	φ 11	φ 22	φ 28	φ 38	φ 50	φ 60
K3	12.8	24.5	31.3	41.3	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.