

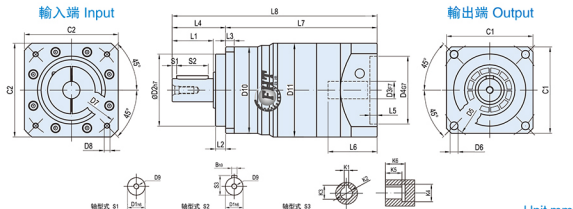
MODEL: VRB

雙段 2-Stage

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



外形尺寸圖 Dimensions:



Unit:mm

尺寸 Size	VRB042-L2	VRB060-L2	VRB090-L2	VRB115-L2	VRB142-L2	VRB180-L2	VRB220-L2
D1	φ13	φ16	φ22	φ32	φ40	φ55	φ75
D2	φ35	φ50	φ80	φ110	φ130	φ180	φ180
D3	φ8 (φ35-8)	φ14 (φ11-14)	φ19 (φ11-19)	φ22 (φ16-24)	φ24 (φ19-35)	φ35 (φ22-35)	φ42 (φ35-42)
D4	φ30 (φ30-38.1)	φ50	φ70 (φ50-80)	φ110 (φ70-110)	φ110 (φ114.3)	φ114.3 (φ110-114.3)	φ180 (φ114.3-200)
D5	φ50	φ70	φ100	φ130	φ165	φ215	φ250
D6	4-φ3.4	4-φ5.5	4-φ7	4-φ9	4-φ11	4-φ13	4-φ17
D7	φ46 (φ45-66.7)	φ70	φ90 (φ70-100)	φ145 (φ90-145)	φ145 (φ145-200)	φ200 (φ145-200)	φ215 (φ210-235)
D8	4-M4(M3)	4-M5 (M4)	4-M6 (M4-M6)	4-M8 (M5-M8)	4-M8 (M8-M12)	4-M12 (M8-M12)	4-M12
D9	MX07P	MX08P	MX12.5P	M12X1.75P	M16X2P	M20X2.5P	M20X2.5P
D10	φ42	φ60	φ87	φ114.5	φ142	φ180	φ216
D11	φ46	φ65	φ90	φ118	φ150	φ184	φ225.5
L1	19.5	28.5	38.5	51	79	92	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	5	5	5	8 (7-8)	11 (6-11)	8 (8-11)	8 (7-10)
L6	27.5	34	34 (≈44)	44 (≈60)	64.5 (≈81.5)	72.5 (≈85)	85 (≈100)
L7	86	105	124.5 (114.5-124.5)	165.5 (149.5-165.5)	226 (189-226)	226 (225-226)	289 (264-299)
L8	112	142	172.5 (162.5-172.5)	230.5 (214.5-230.5)	303 (286-303)	340 (330.5-340)	407 (402-437)
C1	42	60	90	115	142	180	220
C2	46 (46-57)	65	65 (65-86)	90 (90-130)	130 (130-180)	150 (150-180)	200 (180-220)
S1	3	3	4	5	6	6	7
S2	14	22	28	40	65	70	90
S3	15	18	24.5	35	43	59	79.5
B	5	5	6	10	12	16	20
K1	3	4	6	8	10	14	18
K2	φ8	φ11	φ22	φ28	φ38	φ50	φ60
K3	9.4	12.8	24.5	31.3	41.3	53.8	64.4
K4	φ13	φ16	φ32	φ38	φ48	φ60	φ72
K5	15	15	20	27	35	43	60
K6	18	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製大小長短。

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.

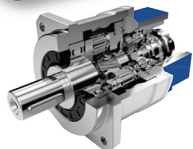
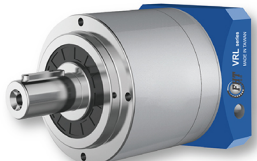
Note 2: The reducer output shaft size and length can be customized for customers.

Note 3: Input sizes can be subject to changed according to the brand servo motors or stepper motors sizes.

PRECISION PLANETARY REDUCERS

精密行星減速機

VRL

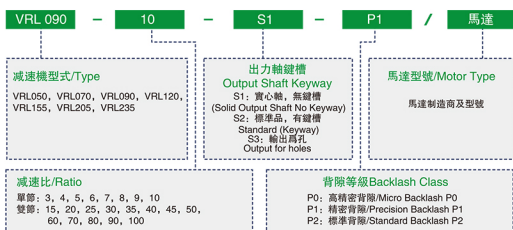


- 1. 靜音**
使用斜齒輪實現順暢安靜地運轉。
- 2. 高精度**
背隙低於3分、定位精準。
- 3. 高剛性、高扭矩**
使用整體式滾珠軸承, 大大提高了剛性和扭矩。
- 4. 法蘭、連接器方式**
可以安裝到世界上任何一臺馬達上。
- 5. 無須滑脂潤滑**
使用高粘度、不易分離的潤滑脂, 有效防止潤滑脂滲漏。
- 6. 維護方便**
在產品壽命期內無需更換潤滑脂, 安裝更便捷。

- 1. Quiet operation**
Helical gears contribute to reduce vibration and noise.
- 2. High precision**
Standard backlash is 3 arc-min, ideal for precision control.
- 3. High rigidity & torque**
High rigidity & high torque were achieved by uncaged needle roller bearings.
- 4. Adapter-bushing connection**
Can be attached to any motor all over the world.
- 5. No grease leakage**
Perfect solution using high viscosity anti-separation grease.
- 6. Maintenance-free**
No need to replace the grease for the life of the unit. Can be attached in any position.

減速機的選型/Indication of Model Numbers

VRL 系列/VRL Series



選型範例: VRL090-100-S2-P1/Panasonic MSMJ 082S1A

VRL 減速機性能資料 Pecification Table

規格 Model No	單位 Unit	節數 Stage	減速比 Ratio	VRL050	VRL070	VRL090	VRL120	VRL155	VRL205	VRL235	
1	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	
			15	20	55	130	208	342	588	1140	
			20	19	50	140	290	542	1050	1700	
2	Nm	2	25	22	60	160	330	650	1200	2000	
			30	20	55	150	310	600	1100	1900	
			35	19	50	140	300	550	1100	1800	
			40	17	45	120	260	500	1000	1600	
			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 _{OUT} / Max. Output Torque	Nm	1,2	3~100	3倍額定輸出力矩/3Times of Nominal Output Torque							
額定輸出力矩 T _{RM} / Rated Output Torque	rpm	1,2	3~100	5000	5000	4000	4000	3000	3000	2000	
最大輸入轉速 n _{IN} / Max. Input Speed	rpm	1,2	3~100	10000	10000	8000	8000	6000	6000	4000	
容許輸入轉速 n _{IN} / Max. Input Speed	N	1	3~10	≤2	≤2	≤2	≤2	≤2	≤2	≤2	
超容許背隙 PO / Micro Backlash PO	arcmin	2	15~100	≤4	≤4	≤4	≤4	≤4	≤4	≤4	
精密背隙 P1 / Precision Backlash P1	arcmin	1	3~10	≤4	≤4	≤4	≤4	≤4	≤4	≤4	
精密背隙 P2	2	15~100	≤6	≤6	≤6	≤6	≤6	≤6	≤6	≤6	
結構剛度 / Torsional Rigidity	Nm/arcmin	1,2	3~100	3	7	14	25	50	145	225	
容許徑向力 F _r / Max. Radial Force	N	1,2	3~100	680	1260	2880	6000	8200	12800	27800	
容許軸向力 F _a / Max. Axial Force	N	1,2	3~100	330	625	1250	2400	3890	6100	15000	
容許軸向力 F _a / Max. Axial Force	N	1,2	3~100	370	625	1250	2400	3890	6100	15000	
使用壽命 / Service Life	hr	1,2	3~100	20000h							
效率 η / Efficiency	%	1	3~10	≥97%							
2	15~100	≥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	°C	1,2	3~100	(-15°C ~ +90°C)							
潤滑 / Lubrication		1,2	3~100	全合成潤滑油類 (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 (1=2000rpm, 3=負載) / Noise Level	dB(A)	1,2	3~100	≤56	≤58	≤60	≤63	≤65	≤67	≤70	

減速機轉動慣量 / Moment of Inertia

規格 Model No	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	7.42	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	50.37	
			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	
			12~40	0.03	0.13	0.44	2.57	7.03	22.51	50.56	
			50~100	0.03	0.13	0.44	2.57	7.03	22.51	50.56	

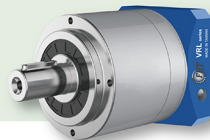
1. 減速比 (i=N_{IN}/N_{OUT}) 2. 輸出轉數 100rpm 時, 作用輸出軸中心位置。

3. 最大加速度力矩 T_{2B}=60% of T_{2NOT}, 連續運轉使用壽命為 10000hrs.

MODEL: VRL

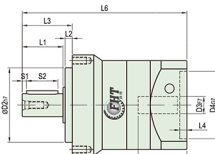
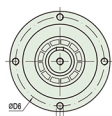
單段 1-Stage

速比: 3, 4, 5, 6, 7, 8, 9, 10

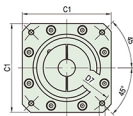


外形尺寸圖 Dimensions:

輸出端 Output



輸入端 Input



Unit:mm

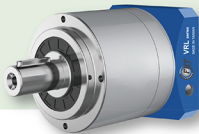
尺寸 Size	VRL070-L1	VRL090-L1	VRL120-L1	VRL155-L1	VRL205-L1	VRL235-L1
D1	φ16	φ22	φ32	φ40	φ55	φ75
D2	φ52	φ68	φ90	φ120	φ160	φ180
D3	φ14 (φ11-14)	φ19 (φ16-24)	φ22 (φ19-35)	φ24 (φ22-35)	φ35 (φ35-42)	φ42 (φ35-55)
D4	φ50 (φ50-70)	φ70 (φ70+110)	φ110 (φ114.3)	φ110 (φ114.3)	φ114.3 (φ114.3-200)	φ180 (φ114.3-200)
D5	4-M5X10L	4-M5X16L	4-M5X16L	4-M10X20L	4-M12X22L	4-M10X28L
D6	φ62	φ80	φ108	φ140	φ194	φ210
D7	φ70 (φ70-90)	φ90 (φ90-145)	φ145 (φ145-200)	φ145 (φ145-200)	φ200 (φ200-235)	φ215 (φ200-235)
D8	4-M5 (M4-M6)	4-M6 (M5-M6)	4-M6 (M5-M6)	4-M8 (M6-M12)	4-M12	4-M12
D9	MSX08P	MSX125P	M12X1.75P	M16X2P	M20X2.5P	M20X2.5P
D10	28.5	36.5	51	79	82	105
L1	5	7-8	6-11	8-11	7-10	8-15
L2	5	6	9	12	15	18
L3	35	44	62	94	100	126
L4	3	4	5	6	7	8
L5	34 (≤44)	44 (≤60)	64.5 (≤81.5)	72.5 (≤82)	85 (≤120)	100 (≤119)
L6	115 (115-125)	146 (146-162)	201 (201-216)	251 (251-261)	284 (284-319)	308 (308-368)
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
S4	5	6	10	12	16	20
K1	4	6	8	10	14	18
K2	φ11	φ22	φ28	φ38	φ50	φ60
K3	12.8	24.5	31.3	41.3	53.8	64.2
K4	φ16	φ32	φ38	φ48	φ60	φ74
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。
 Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.
 注2: 減速機力矩可以為客戶定制大小和長短。
 Note 2: The reducer output shaft size and length can be customized for customers.
 注3: 輸入尺寸樣式各品牌向廠馬達或步進馬達可以有變動。
 Note 3: Input sizes can be subject to changed according to the brand series of motor or stepper motors sizes.

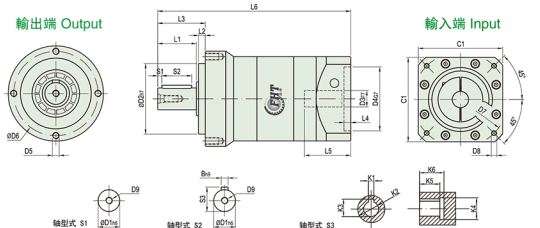
MODEL: VRL

雙段 2-Stage

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



外形尺寸圖 Dimensions:



Unit:mm

尺寸 Size	VRL070-L1	VRL090-L2	VRL120-L2	VRL155-L2	VRL205-L2	VRL235-L2
D1	φ16	φ22	φ32	φ40	φ55	φ75
D2	φ52	φ68	φ90	φ120	φ160	φ180
D3	φ14 (φ11-14)	φ19 (φ11-19)	φ22 (φ16-24)	φ24 (φ19-35)	φ35 (φ22-35)	φ42 (φ35-42)
D4	φ50	φ70 (φ50-80)	φ110 (φ70-110)	φ110 (φ114.3)	φ110 (φ114.3)	φ180 (φ114.3-200)
D5	4-M5X10L	4-M5X12L	4-M5X16L	4-M10X20L	4-M12X22L	4-M16X28L
D6	φ62	φ80	φ108	φ140	φ184	φ210
D7	φ70	φ90 (φ70-100)	φ145 (φ90-145)	φ145 (φ145-200)	φ145 (φ145-200)	φ215 (φ200-235)
D8	4-M5 (M4)	4-M5 (M4-M6)	4-M5 (M5-M8)	4-M8 (M8-M12)	4-M8 (M8-M12)	4-M12
D9	MSX0.8P	MBX1.25P	M12X1.75P	M16X2P	M20X2.5P	M20X2.5P
L1	28.5	36.5	51	79	82	100
L2	5	6	9	12	15	18
L3	35	44	62	94	100	126
L4	5	5	8 (7-8)	11 (5-11)	8 (5-11)	8 (7-10)
L5	34	34 (φ44)	44 (φ40)	64.5 (φ61.5)	72.5 (φ62)	85 (φ80)
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 (150-180)	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	φ11	φ22	φ28	φ38	φ50	φ60
K3	12.8	24.5	31.3	41.3	53.8	64.4
K4	φ16	φ32	φ38	φ48	φ60	φ72
K5	15	20	27	35	43	60
K6	18	24	32	40	50	65

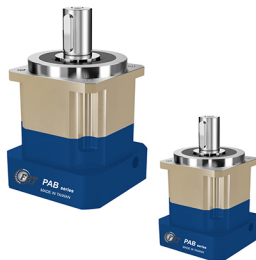
注1: () 括號內為可選擇範圍尺寸, () 括號外為標準尺寸。
 注2: 減速機出力軸可以為客戶定制大小和長度。
 注3: 輸入尺寸依據各品牌同類馬達或步進馬達可以有所變動。

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: Input sizes can be subject to changed according to the brand servo motors or stepper motors sizes.

PRECISION PLANETARY REDUCERS

精密行星減速機

PAB



- 行星背架與輸出軸一體式結構確保大扭力耐用性及穩定性
Integrated design of planet carrier and output shaft ensures the maximum torque stiffness and stability
- 齒輪表面利用無電鍍處理, 連接板採藍色陽極處理, 提高環境的耐受性和抗腐蝕能力。
Electroless Nickel deposition treatment and black anodizing treatment are employed to gear box surface and motor adapter module respectively, the tolerance to the environment and resistant to corrosion are enhanced.
- 最低的回程間隙 low backlash
- 高效率(95%)high efficiency (95%)
- 終生潤滑 life time lubrication

減速機的選型/Indication of Model Numbers

PAB 系列/PAB Type

PAB 090 - 10 - S1 - P1 / 馬達

減速機型式/Type

PAB042, PAB060, PAB090, PAB115
 PAB142, PAB180, PAB220

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 Type

馬達製造商及型號
 Motor manufacturer and model

減速比 Ratio

單節: 3, 4, 5, 6, 7, 8, 9, 10
 雙節: 12, 15, 16, 20, 25, 28, 30, 35, 40, 50, 70, 80, 100

背隙等級Backlash Class

P0: 高精度背隙/Micro Backlash P0
 P1: 精密背隙/Precision Backlash P1
 P2: 標準背隙/Standard Backlash P2

型號範圍: PAB090-100-S2-P1/Panasonic MSMJ 082S1A