Haitec-GR®

PLANETARY GEARBOX & GEAR MOTOR

高精度行星减速器
行星齿轮减速电机产品宣传册

Haitec-GR®

广州欧特士传动设备有限公司

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高精度行星齿轮减速器与伺服电机、步进电机配合用于诸多控制场合。最低回程间隙(＜3')；高输出扭矩；高效率(96%)；硬化齿；22种减速比i=3,...,512；低噪音(＜65dB(A))；任意位置安装；简易电机装配；终身润滑；外形尺寸40,60,80,120,160mm；更多选配方式。

High precision planetary gearbox matched with serve motor, stepping motor are widely used. lowest backlash(＜3'); high output torques; high efficiency(96%); honed toothings; 22 ratios i=3,...,512; low noise (＜65dB(A); any mounting position; easy motor mounting; life time lubrication; Figure diameters 40,60,80,120,160mm; more options.

高精度行星齿轮减速器，采用斜齿轮设计，与以往的直齿相比，齿轮的啮合更加流畅顺滑，噪音也有所降低；低回程间隙(＜3′)，特别在低脉动旋转时，充分展现高精度伺服电机的优越性能；无需维护保养，安装方便；减速比齐全(单级实现3,4,5,6,7,8,9,10)组合后有更多的速比选择空间。

High precision planetary gearbox adopts helical gear design. Its mesh between gears is much more convenient than previous spur gear. Noise is reduced, backlash is small (＜3′), especially show excellent perfromance of high precision servo motor when low ripple rotate. No need for maintenance and easy assembly. There're many ratios for your selection (3,4,5,6,7,8,9,10 for one stage). We can get more ratios with different mix.

传动型行星齿轮减速器与有刷（无刷）直流电动机配合组成减速电动机，既体现直流电动机的高出力、控制型特点，又具有行星齿轮减速器的高承载扭矩特色。二者完美的结合体现出产品的小型化、大扭矩。

The planetary gearbox for transmission is widely matched with DC motor and BLDC motor. It shows the characters of high torque and controlablility as well as the high lasting torque. The perfect combination fully expresses the product's smaller and high torque.

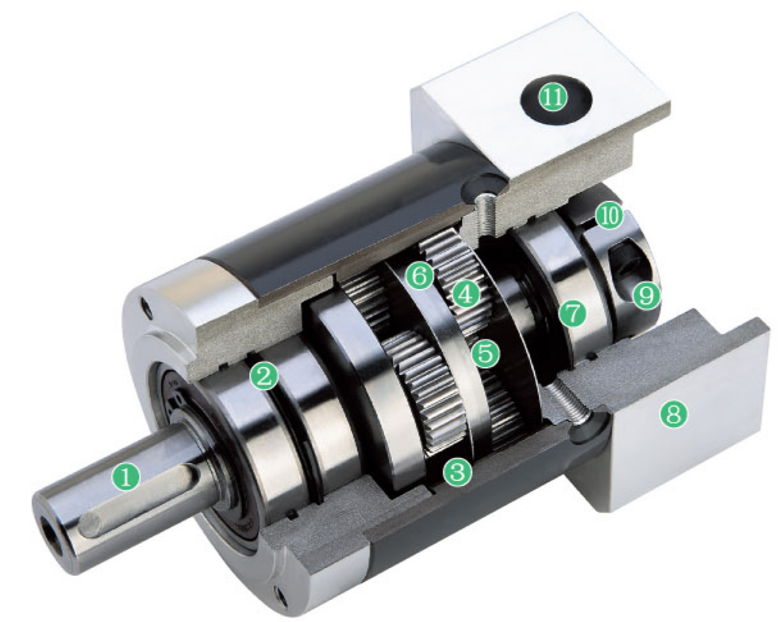
BRIEF INTRODUCTION

广州欧特士传动设备有限公司是一家集科、工、贸于一体的新型现代化企业。公司拥有雄厚的技术实力和先进的生产设备及工艺，累积多年意大利传动机械的制造经验，承接传动设备系统的设计、制造及售后服务全套的优质服务，保证了产品经久耐用安全可靠、小型高效的精良品质。

The company has excellent technological strengths and advanced production facilities and processes . It is capable of undertaking the full range of services from transmission system designs , productions to after–sales Service. The company is also committed to product reliability and efficiency.

精密型行星齿轮箱型号的阅读方法
PRODUCT NUMBER CODE - PRECISION PLANETARY GEARBOX PL SERIES

剖视图 SECTIONAL DRAWING

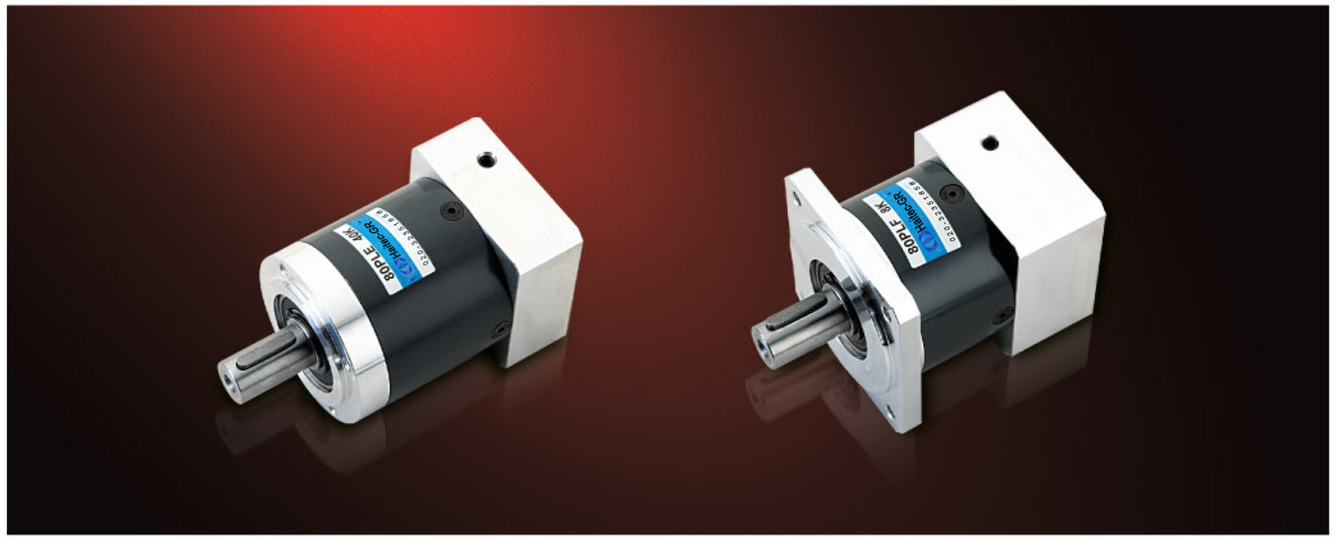


①输出轴 Output shaft
②输出轴轴承 Bearing for the output shaft
③内齿轮 Internal gear
④行星轮 Planetary gear
⑤太阳轮 Sunwheel
⑥满针滚针轴承 Full complement needle bearing
⑦太阳轮轴承 Bearing for the sunwheel
⑧适配电机法兰 Appropriate motor flange
⑨精密装夹系统 Precision clamping system
⑩夹紧环 Clamping ring
⑪装配孔 mounting hole

行星齿轮箱 Planetary Gearbox

80 PLE 40
① ② ③

①	齿轮箱外径尺寸 Gearbox outline dimension 精密型系列transmission series 40:外径External diameter ø40mm 60:外径External diameter ø60mm 80:外径External diameter ø80mm 120:外径External diameter ø120mm 160:外径External diameter ø160mm
②	行星齿轮箱Planetary gearbox PLE:精密行星---圆形法兰输出 Precision planetary-round flange output PLF:精密行星---方形法兰输出 Precision planetary-square flange output WPLE:精密行星---直角圆形法兰输出 Precise planetary-right angle round flange output WPLF:精密行星---直角方形法兰输出 Precise planetary-right angle square flange output PLS:精密行星---高刚性，低回差 Precise planetary-high rigidity, low back lash
③	减速比 Reduction ratio 40:减速比 Reduction ratio 1:40



PL系列精密行星减速机
PL SERIES PRECISION PLANETARY GEAR MOTOR

■技术资料 TECHNICAL DATA

产品型号Product type		PL40	PL60	PL80	PL120	PL160	减速比Reduction ratio	级数Number of stage
额定输出扭矩 Rated output torque	N.M	4.5	12	40	80	400	3	1
		6	16	50	100	450	4	
		6	16	50	110	450	5	
		5	15	45	120	450	8	
		5	15	45	120	305	10	
		16.5	44	110	210	------	9	2
		18	44	120	260	800	12	
		18	40	110	230	700	15	
		20	44	120	260	800	16	
		20	44	120	260	800	20	
		18	40	110	230	700	25	
		20	44	120	260	800	32	
		18	40	110	230	700	40	
		7.5	18	50	120	450	64	
		20	44	120	260	/	60	3
		20	44	120	260	/	80	
		20	44	120	260	/	100	
		18	40	110	230	/	120	
		20	44	120	260	/	160	
		18	40	110	230	/	200	
		20	44	120	260	/	256	
		18	40	110	230	/	320	
		7.5	18	50	120	/	512	
寿命Life	小时Hour	30,000						
瞬间急停扭矩 Instant stop torque	N.M	2倍于额定输出扭矩 Two times of rated output torque						

产品型号 Product type	PL40	PL60	PL80	PL120	PL160	单位	级数number of stage
最大径向力 Max radial torque	160	340	650	1500	4200	N	
最大轴向力 Max axial torque	160	450	900	2100	6000	N	
满载效率 Full load efficiency	96					%	1
	94						2
	90						3
重量 Weight	0.4	0.9	2.1	6	18	Kg	1
	0.5	1.1	2.6	8	22		2
	0.6	1.3	3.1	9.5	/		3
工作温度 Operating temperature	-25℃～+90℃					℃	
保护等级 IP	IP54						
润滑方式 Lubrication type	终身润滑 Lifetime lubrication						
安装方式 Mounting type	任意 Any						

最大径向力与最大轴向力,输出100RPM时,作用于输出轴中心位置(L/2)处。
The max radial and axial torque work in the location of the center of output shaft when the out speed is 100RPM.

PL系列精密行星减速机
PL SERIES PRECISION PLANETARY GEAR MOTOR

■技术资料 TECHNICAL DATA

产品型号Product type		PL40	PL60	PL80	PL120	PL160	减速比Reduction ratio
转动惯量 Moment of inertia	Kgcm²	0.031	0.135	0.77	2.63	12.14	3
		0.022	0.093	0.52	1.79	7.78	4
		0.019	0.078	0.45	1.53	6.07	5
		0.017	0.065	0.39	1.32	4.63	8
		0.015	0.054	0.34	1.14	3.52	10
		0.030	0.131	0.74	2.56	/	9
		0.029	0.127	0.72	2.53	12.37	12
		0.023	0.077	0.71	1.75	12.35	15
		0.022	0.088	0.50	1.50	7.47	16
		0.019	0.075	0.44	1.49	6.65	20
		0.019	0.075	0.44	1.30	5.81	25
		0.017	0.064	0.39	1.30	4.5	32
		0.016	0.064	0.39	1.30	4.5	40
		0.016	0.064	0.39	1.30	4.5	64
		0.029	0.130	0.70	2.57	/	60
		0.019	0.075	0.50	1.50	/	80
		0.019	0.075	0.44	1.49	/	100
		0.029	0.130	0.70	2.50	/	120
		0.016	0.064	0.39	1.30	/	160
		0.016	0.064	0.39	1.30	/	200
		0.016	0.064	0.39	1.30	/	256
		0.016	0.064	0.39	1.30	/	320
		0.016	0.064	0.39	1.30	/	512

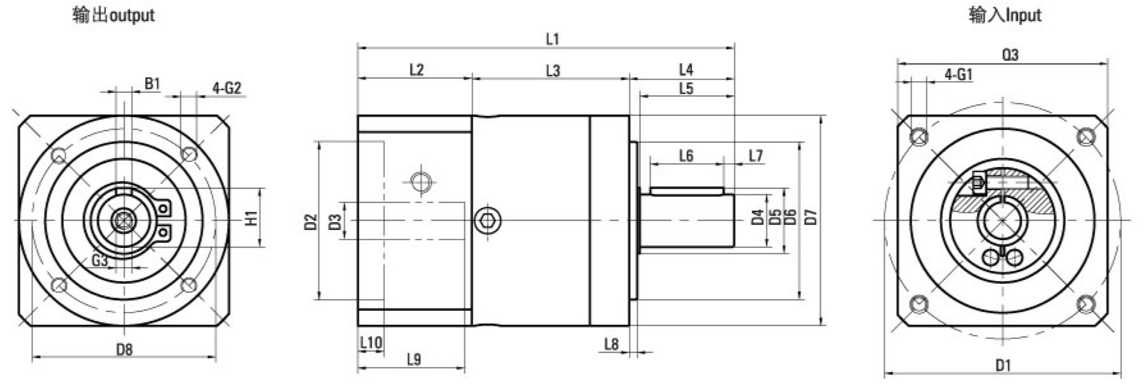
产品型号Product type			PL40	PL60	PL80	PL120	PL160	级数Number of stage
回程间隙 Backlash	arcmin 弧分	精密Precision	<5	<3	<3	<3	<3	1
		标准Standard	<10	<8	<8	<8	<8	
		精密Precision	<8	<5	<5	<5	<5	2
		标准Standard	<12	<10	<10	<10	<10	
		精密Precision	<10	<8	<8	<8	<8	3
		标准Standard	<15	<12	<12	<12	<12	

产品型号Product type		PL40	PL60	PL80	PL120	PL160
抗扭钢性 Torsional stiffness	N.M/arcmin	0.7	1.8	4.5	12	38
噪声 Noise	dB(A)	55	58	60	65	70
最高输出转速 Max output speed	min^{-1}	10000	8000	6000	6000	6000
推荐输入转速 Recommend input speed	min^{-1}	4500	4000	4000	4000	3000

1.转动惯量与输入轴有关。 2.噪声检测标准，距离1m，在输入转速3000转/分空载时测得。
1. The moment of inertia is related with input shaft. 2. Noise test standard pressure level, distance 1m, measured on idle running with an input speed of 3000rpm.

PLE精密行星减速机
PLE SERIES PRECISION PLANETARY GEAR MOTOR

机械参数 DIMENSIONS



■单位Unit: mm

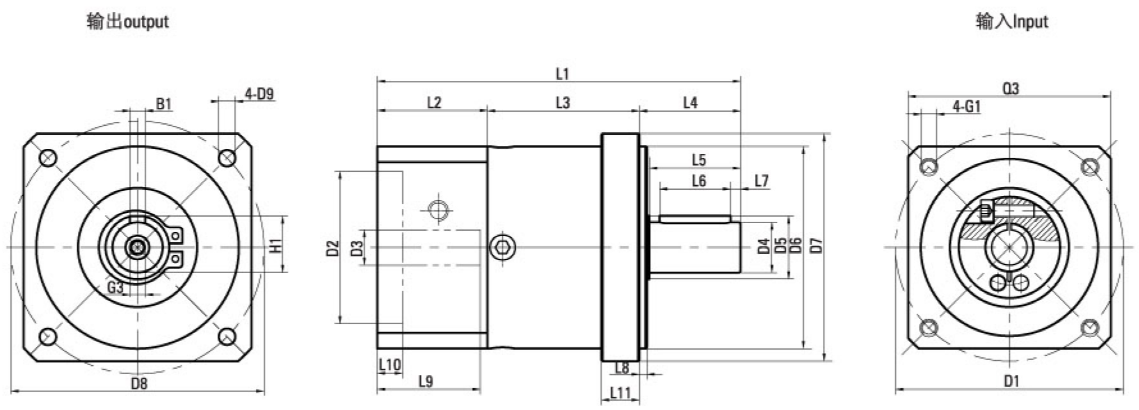
产品型号Product type	PLE40			PLE60			PLE80			PLE120			PLE160	
级数 Number of stage	1	2	3	1	2	3	1	2	3	1	2	3	1	2
L1箱体总长 L1 overall length	93.5	106.5	119	113	126	138.5	143.5	161.5	179	191.7	221.5	249	285.5	335
L3箱体长度 L3 body length	39	52	64	46.5	59.5	72	60	78	95.5	73.7	101.5	129	104	153.5
输出端 Output														
L4出轴长度 L4 output shaft length	26			35			40			55			87	
L5出轴长至轴肩 L5 output length to the shaft shoulder	24			30.5			36			50			82	
L6键长度 L6 key length	16			25			28			40			70	
L7键至轴末端长 L7 key length to the shaft end	2.5			2.5			4			5			5	
L8定位凸台长度 L8 spigot length	2			3			3			4			5	
D4出轴直径 D4 output shaft diameter	ø10 h7			ø14h7			ø20h7			ø25h7			ø40 h7	
D5轴肩直径 D5 shaft shoulder diameter	ø12			ø17			ø25			ø35			ø55	
D6定位凸台直径 D6 spigot diameter	ø26			ø40			ø60			ø80			ø130	
D7箱体直径 D7 body diameter	ø40			ø60			ø80			ø115			ø160	
D8安装孔分布圆 D8 hole circle	ø34			ø52			ø70			ø100			ø145	
B1键宽 B1 key width	3			5			6			8			12	
H1健高 H1 key height	11.2			16			22.5			28			43	
G2安装螺纹孔 G2 mounting screw hole	M4x6			M5x8			M6x10			M10x16			M12x20	
G3中心螺纹孔 G3 center screw hole	M3x9			M5x12			M6x16			M10x22			M12x25	
输入端 Input														
L2输入法兰长度 L2 input flange length	24.3			31.5			43.5			63			25	
L9电机轴长度 L9 motor shaft length	25			30			40			55			79	
L10定位凸台深度 L10 spigot depth	6			10			10			12			12	
D1安装孔分布圆 D1 mounting hole distribution circle	46			ø70			ø90			ø145			ø200	
D2定位凸台直径 D2 spigot diameter	ø30 H7			ø50H7			ø70H7			ø110H7			ø114.3	
D3输入轴轴径 D3 input shaft diameter	ø8			ø14			ø19			ø24			ø35	
G1安装螺纹孔 G1 mounting screw hole	M4x10			M5x15			M6x15			M8x22			M12x25	
Q3输入法兰 Q3 input flange	□40			□60			□80			□130			□175	

※输入端尺寸可根据电机尺寸制作。
※Input size made according to motor size.

PLF精密行星减速机

PLF SERIES PRECISION PLANETARY GEAR MOTOR

机械参数 DIMENSIONS



■单位Unit: mm

产品型号Product type	PLF40			PLF60			PLF80			PLF120			PLF160	
级数 Number of stage	1	2	3	1	2	3	1	2	3	1	2	3	1	2
L1箱体总长 L1 overall length	138.5	138.5	138.5	113	126	138.5	143.5	161.5	179	191.7	221.5	249	138.5	138.5
L3箱体长度 L3 body length				46.5	59.5	72	60	78	95.5	73.7	101.5	129		
输出端 Output														
L4出轴长度 L4 output shaft length	26			35			40			55			87	
L5出轴长至轴肩 L5 output length to the shaft shoulder	24			30.5			36			50			82	
L6键长度 L6 key length	16			25			28			40			70	
L7键至轴末端长 L7 key length to the shaft end	2.5			2.5			4			5			5	
L8定位凸台长度 L8 spigot length	2			3			3			4			5	
L11输出法兰厚度 L11 output flange thickness	6			8			10			15			15	
D4出轴直径 D4 output shaft diameter	ø10 h7			ø14h7			ø20h7			ø25h7			ø40 h7	
D5轴肩直径 D5 shaft shoulder diameter	ø12			ø17			ø25			ø35			ø55	
D6定位凸台直径 D6 spigot diameter	ø26			ø50			ø80			ø110			ø130	
D7输出法兰 D7 output flange	□45			□60			□90			□120			□175	
D8安装孔分布圆 D8 mounting hole distribution circle	ø50			ø70			ø100			ø130			ø185	
D9法兰安装孔 D9 mounting hole	ø3.5			ø5.5			ø6.5			ø8.5			ø11	
B1键宽 B1 key width	3			5			6			8			12	
H1键高 H1 key height	11.2			16			22.5			28			43	
G3中心螺纹孔 G3 center screw hole	M3x9			M5x12			M6x16			M10x22			M12x25	
输入端 Input														
L2输入法兰长度 L2 input flange length	24.3			31.5			43.5			63			25	
L9电机轴长度 L9 motor shaft length	25			30			40			55			79	
L10定位凸台深度 L10 spigot depth	6			10			10			12			12	
D1安装孔分布圆 D1 hole circle	46			ø70			ø90			ø145			ø200	
D2定位凸台直径 D2 spigot diameter	ø30 H7			ø50H7			ø70H7			ø110H7			ø114.3	
D3输入轴轴径 D3 input shaft diameter	ø8			ø14			ø19			ø24			ø35	
G1安装螺纹孔 G1 mounting screw hole	M4x10			M5x15			M6x15			M8x22			M12x25	
Q3输入法兰 Q3 input flange	□40			□60			□80			□130			□175	

※输入端尺寸可根据电机尺寸制作。
※Input size made according to motor size.

PLS系列精密行星减速机

PLS SERIES PRECISION PLANETARY GEAR MOTOR

■技术资料 TECHNICAL DATA

产品型号Product type		PLS70	PLS90	PLS115	PLS142	PLS190	减速比Reduction ratio	级数Number of stage
额定输出扭矩 Rated output torque	N.M	30	75	150	400	1000	3	1
		40	100	200	560	1200	4	
		50	110	210	700	1600	5	
		37	62	148	450	1000	8	
		27	45	125	305	630	10	
		77	120	260	910	1800	12	2
		68	110	210	780	1800	15	
		77	120	260	910	1800	16	
		77	110	260	910	1800	20	
		68	110	210	780	1800	25	
		77	120	260	910	1800	32	
		68	110	210	780	1800	40	
		37	62	148	450	1000	64	
		27	45	125	305	630	100	
寿命Life	小时Hour	30,000						
瞬间急停扭矩 Instant stop torque	N.M	2倍于额定输出扭矩 Two times of rated output torque						

产品型号 Product type	PLS70	PLS90	PLS115	PLS142	PLS190	单位	级数number of stage
最大径向力 Max radial torque	3000	3900	4300	8200	12000	N	
最大轴向力 Max axial torque	6000	9000	12000	19000	28000	N	
满载效率 Full load efficiency	98					%	1
	95						2
重量 Weight	3.0	4.3	9.0	15.4	33.5	Kg	1
	3.8	5.7	11.6	18.5	45		2
工作温度 Operating temperature	-25℃~+90℃					℃	
保护等级 IP	IP54						
润滑方式 Lubrication type	终身润滑 Lifetime lubrication						
安装方式 Mounting type	任意 Any						

最大径向力与最大轴向力,输出100RPM时,作用于输出轴中心位置(L/2)处。
The max radial and axial torque work in the location of the center of output shaft when the out speed is 100RPM.

PLS系列精密行星减速机
PLS SERIES PRECISION PLANETARY GEAR MOTOR

■技术资料 TECHNICAL DATA

产品型号Product type		PLS70	PLS90	PLS115	PLS142	PLS190	减速比Reduction ratio
转动惯量 Moment of inertia	Kgcm²	0.32	0.81	2.10	12.14	47.52	3
		0.20	0.60	1.51	7.78	29.69	4
		0.16	0.52	1.22	6.07	23.18	5
		0.12	0.46	1.05	4.63	16.83	8
		0.10	0.44	1.00	4.25	15.32	10
		0.22	0.75	2.00	12.37	30.25	12
		0.21	0.74	2.00	12.35	23.53	15
		0.20	0.56	1.48	7.47	28.95	16
		0.17	0.50	1.41	6.65	22.71	20
		0.16	0.48	1.21	5.81	22.46	25
		0.13	0.45	1.46	6.36	16.65	32
		0.13	0.45	1.05	5.28	16.54	40
		0.13	0.45	1.05	4.50	16.45	64
		0.12	0.44	1.00	4.17	15.07	100

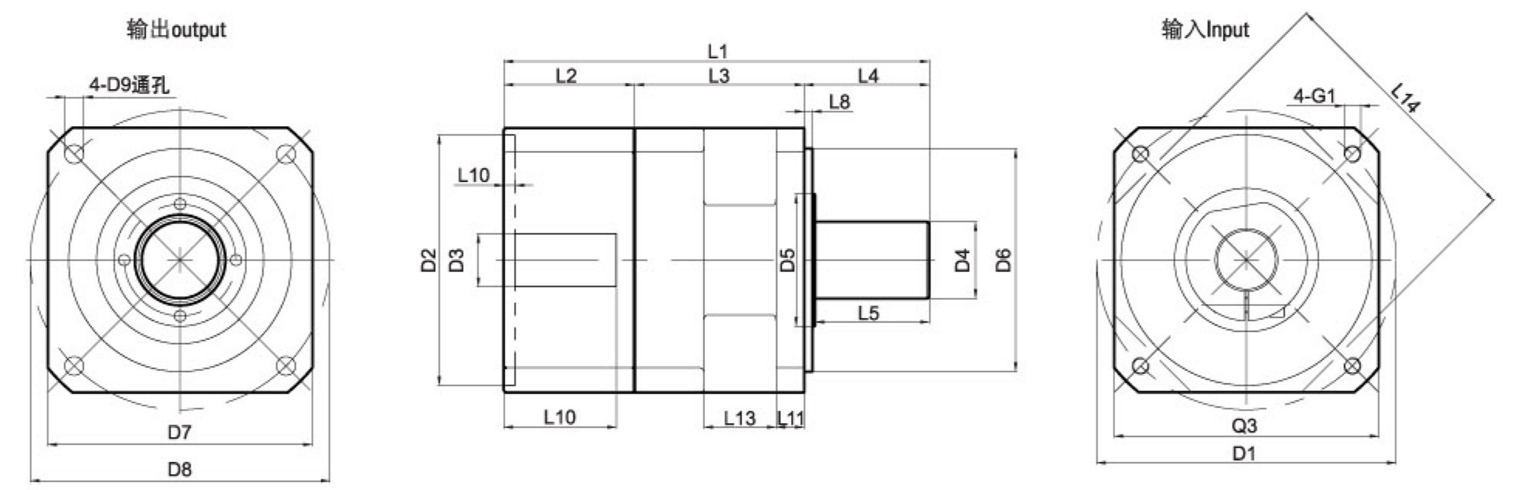
产品型号Product type			PLS70	PLS90	PLS115	PLS142	PLS190	级数Number of stage
回程间隙 Backlash	Arcmin 弧分	精密Precision	< 3	< 3	< 3	< 3	< 3	1
		标准Standard	< 8	< 8	< 8	< 8	< 8	
		精密Precision	< 5	< 5	< 5	< 5	< 5	2
		标准Standard	< 10	< 10	< 10	< 10	< 10	

产品型号Product type		PLS70	PLS90	PLS115	PLS142	PLS190	级数Number of stage
抗扭钢性 Torsional stiffness	N.M/arcmin	6	9	20	44	130	1
		7	10	22	46	140	2
噪声 Noise	dB(A)	58	60	65	68	70	
最高输出转速 Max output speed	min^{-1}	14000	10000	8500	6500	6000	
推荐输入转速 Recommend input speed	min^{-1}	5000	4500	4000	3000	2500	

1.转动惯量与输入轴有关。 2.噪声检测标准，距离1m，在输入转速3000转/分空载时测得。
1. The moment of inertia is related with input shaft. 2. Noise test standard pressure level, distance 1m, measured on idle running with an input speed of 3000rpm.

PLS精密行星减速机
PLS SERIES PRECISION PLANETARY GEAR MOTOR

机械参数 DIMENSIONS



■单位Unit: mm

产品型号Product type	PLS70		PLS90		PLS115		PLS142		PLS190	
级数 Number of stage	1	2	1	2	1	2	1	2	1	2
L1箱体总长 L1 overall length	124	147.5	155.5	184	193	226.5	269	318.5	305.5	353
L3箱体长度 L3 body length	62.5	86	69	97.5	77.5	111	102	151.5	121.5	169
输出端 Output										
L4出轴长度 L4 output shaft length	32		41.5		64.5		87		90	
L5出轴长至轴肩 L5 output length to the shaft shoulder	28		36		58		80		82	
L8定位凸台长度 L8 spigot length	3		3		4		5		6	
D4出轴直径 D4 output shaft diameter	ø19 h7		ø22 h7		ø32 h7		ø40 h7		ø55 h7	
D5轴肩直径 D5 shaft shoulder diameter	ø35		ø40		ø45		ø65		ø95	
D6定位凸台直径 D6 spigot diameter	ø60 h7		ø80 h7		ø110 h7		ø130 h7		ø160 h7	
D7输出法兰 D7 output flange	□70		□90		□115		□142		□190	
D8安装孔分布圆 D8 mounting hole distribution circle	ø75		ø100		ø130		Φ165		ø215	
D9法兰安装孔 D9 mounting hole	ø5.5		ø6.5		ø8.5		Φ11		ø13.5	
L13工艺槽宽度 L13 groove width	23		30		34		52		52	
L14工艺槽 L14 groove	□64		□87		□115		□140		□190	
输入端 Input										
L2输入法兰长度 L2 input flange length	29.5		45		51		80		94	
L9电机轴长度 L9 motor shaft length	23		35		45		67		81	
L10定位凸台深 L10 motor spigot depth	3		3.5		3.5		6		6	
D1安装孔分布圆 D1 hole circle	ø75		ø100		ø115		ø165		ø215	
D2定位凸台直径 D2 spigot diameter	ø50 H7		ø80 H7		ø95 H7		ø130 H7		ø180 H7	
D3输入轴轴径 D3 input shaft diameter	ø11 H7		ø16 H7		ø19 H7		ø35 H7		ø38 H7	
G1安装螺纹孔x深度 G1 mounting screw hole x depth	M5x12		M6x15		M8x22		M10x25		M12x25	
Q3输入法兰 Q3 input flange	□70		□90		□115		□142		□190	

※输入端尺寸可根据电机尺寸制作。
※Input size made according to motor size.

Planetary Gearbox & Planetary Gear Motor
PLS series precision planetary gear motor

WPL系列精密行星减速机

WPL SERIES PRECISION PLANETARY GEAR MOTOR

■技术资料 TECHNICAL DATA

产品型号Product type		WPL40	WPL60	WPL80	WPL120	减速比Reduction ratio	级数Number of stage
额定输出扭矩 Rated output torque	N.M	4.5	12	40	80	3	1
		6	16	50	100	4	
		6	16	50	110	5	
		5	15	45	120	8	
		5	15	45	120	10	
		16.5	44	110	210	9	2
		18	44	120	260	12	
		18	40	110	230	15	
		20	44	120	260	16	
		20	44	120	260	20	
		18	40	110	230	25	
		20	44	120	260	32	
		18	40	110	230	40	
		7.5	18	50	120	64	
		20	44	120	260	60	3
		20	44	120	260	80	
		20	44	120	260	100	
		18	40	110	230	120	
		20	44	120	260	160	
		18	40	110	230	200	
		20	44	120	260	256	
		18	40	110	230	320	
		7.5	18	50	120	512	
寿命Life	小时Hour	30,000					
瞬间急停扭矩 Instant stop torque	N.M	2倍于额定输出扭矩 Two times of rated output torque					

产品型号 Product type	WPL40	WPL60	WPL80	WPL120	单位	级数number of stage
最大径向力 Max radial torque	160	340	650	1500	N	
最大轴向力 Max axial torque	160	450	900	2100	N	
满载效率 Full load efficiency	94				%	1
	92					2
	88					3
重量 Weight	0.51	1.7	4.4	12.0	Kg	1
	0.61	1.9	5.0	14.0		2
	0.71	2.1	5.5	16.0		3
工作温度 Operating temperature	-25℃～+90℃				℃	
保护等级 IP	IP54					
润滑方式 Lubrication type	终身润滑 Lifetime lubrication					
安装方式 Mounting type	任意 Any					

最大径向力与最大轴向力,输出100RPM时,作用于输出轴中心位置(L/2)处。
The max radial and axial torque work in the location of the center of output shaft when the out speed is 100RPM.

WPL系列精密行星减速机

WPL SERIES PRECISION PLANETARY GEAR MOTOR

■技术资料 TECHNICAL DATA

产品型号Product type		WPL40	WPL60	WPL80	WPL120	减速比Reduction ratio
转动惯量 Moment of inertia	Kgcm²	0.044	0.246	1.189	5.75	3
		0.035	0.204	0.939	3.91	4
		0.032	0.189	0.869	3.35	5
		0.030	0.176	0.809	2.89	8
		0.026	0.152	0.730	2.54	10
		0.043	0.242	1.159	5.73	9
		0.042	0.238	1.139	5.60	12
		0.036	0.188	1.129	5.53	15
		0.035	0.199	0.919	3.83	16
		0.032	0.186	0.859	3.28	20
		0.032	0.186	0.859	3.26	25
		0.030	0.175	0.809	2.84	32
		0.029	0.175	0.809	2.84	40
		0.029	0.175	0.809	2.84	64
		0.042	0.187	0.929	5.62	60
		0.032	0.186	0.919	3.28	80
		0.032	0.186	0.859	3.26	100
		0.042	0.175	1.119	5.47	120
		0.029	0.175	0.809	2.84	160
		0.029	0.175	0.809	2.84	200
		0.029	0.175	0.809	2.84	256
		0.029	0.175	0.809	2.84	320
		0.029	0.175	0.809	2.84	512

产品型号Product type	单位Dimensions	WPL40	WPL60	WPL80	WPL120	级数Number of stage
回程间隙Backlash	弧分arcmin	＜40	＜30	＜25	＜15	1
		＜45	＜35	＜30	＜20	2
		＜50	＜40	＜35	＜25	3
抗扭钢性 Torsional stiffness	N.M/arcmin	0.7	1.5	4.5	10	1
		1.1	2.5	6.5	13	2
		1.0	2.5	6.3	12	3
噪声 Noise	dB(A)	65	65	68	70	
最高输出转速 Max output speed	min^{-1}	18000	13000	7000	6500	
推荐输入转速 Recommend input speed	min^{-1}	4500	3000	3000	3000	

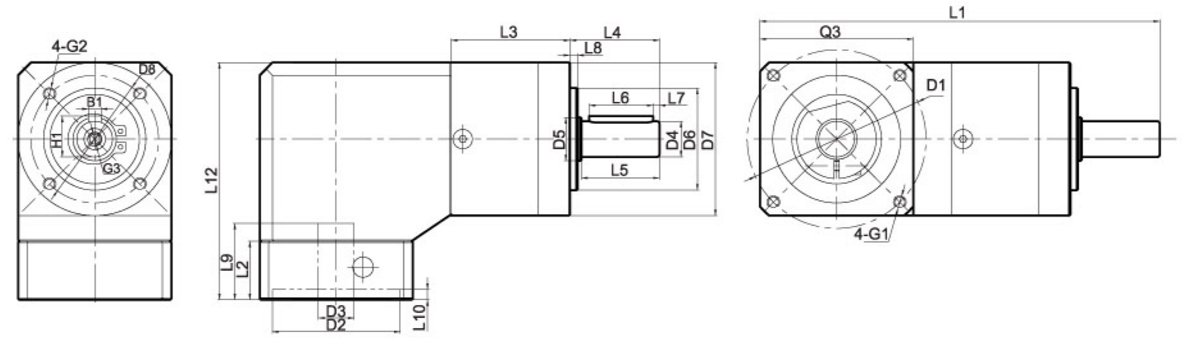
1.转动惯量与输入轴有关。 2.噪声检测标准，距离1m，在输入转速3000转/分空载时测得。
1. The moment of inertia is related with input shaft. 2. Noise test standard pressure level, distance 1m, measured on idle running with an input speed of 3000rpm.

Planetary Gearbox & Planetary Gear Motor
WPL series precision planetary gear motor
Haitec-GR® 2011-2012

WPLE精密行星减速机
WPLE SERIES PRECISION PLANETARY GEAR MOTOR

机械参数 DIMENSIONS

输出output　　　　输入Input



■单位Unit: mm

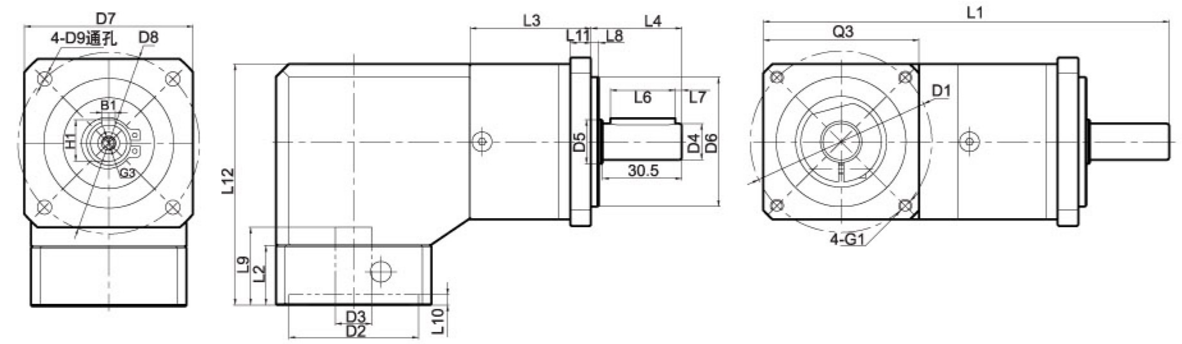
产品型号Product type	WPLE40			WPLE60			WPLE80			WPLE120		
级数 Number of stage	1	2	3	1	2	3	1	2	3	1	2	3
L1箱体总长 L1 overall length	119.5	132.5	144.5	156.5	169.5	182	194	212	229.5	258.7	286.5	314
L3箱体长度 L3 body length	38.5	51.5	63.5	46.5	59.5	72	60	78	95.5	73.7	101.5	129
L12总高 L12 overall height	68			93			109.5			145.5		
输出端 Output												
L4出轴长度 L4 output shaft length	26			35			40			55		
L5出轴长至轴肩 L5 output length to the shaft shoulder	24			30.5			36			50		
L6键长度 L6 key length	16			25			28			40		
L7键至轴末端长 L7 key length to the shaft end	2.5			2.5			4			5		
L8定位凸台长度 L8 spigot length	2			3			3			4		
D4出轴直径 D4 output shaft diameter	ø10 h7			ø14h7			ø20h7			ø25h7		
D5轴肩直径 D5 shaft shoulder diameter	ø12			ø17			ø25			ø35		
D6定位凸台直径 D6 spigot diameter	ø26			ø40			ø60			ø80		
D7齿轮箱端面 gear box section	ø40			ø60			ø80			ø115		
D8安装孔分布圆 D8 mounting hole distribution circle	ø34			ø52			ø70			ø100		
B1键宽 B1 key width	3			5			6			8		
H1键高 H1 key height	11.2			16			22.5			28		
G2安装螺纹孔x深度 G2 mounting screw hole x depth	M4x6			M5x8			M6x10			M10x16		
G3中心螺纹孔 G3 center screw hole	M3x9			M5x12			M6x16			M10x22		
输入端 Input												
L2输入法兰长度 L2 input flange length	19			23			26.5			27		
L9电机轴长度 L9 motor shaft length	25			30			35			45		
L10定位凸台深度 L10 spigot depth	3			2.5			3.5			3.5		
D1安装孔分布圆 D1 hole circle	ø46			ø70			ø100			ø115		
D2定位凸台直径 D2 spigot diameter	ø30 H7			ø50H7			ø80 H7			ø95 H7		
D3输入轴轴径 D3 input shaft diameter	ø8 H7			ø14 H7			ø16 H7			ø19 H7		
G1安装螺纹孔 G1 mounting screw hole	M4x10			M5x12			M6x15			M8x20		
Q3输入法兰 Q3 input flange	□40			□60			□90			□115		

※输入端尺寸可根据电机尺寸制作。
※Input size made according to motor size.

WPLF精密行星减速机
WPLF SERIES PRECISION PLANETARY GEAR MOTOR

机械参数 DIMENSIONS

输出output　　　　输入Input



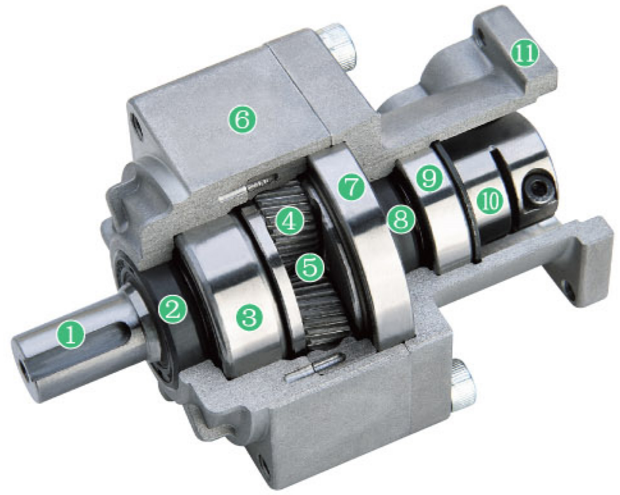
■单位Unit: mm

产品型号Product type	WPLF40			WPLF60			WPLF80			WPLF120		
级数 Number of stage	1	2	3	1	2	3	1	2	3	1	2	3
L1箱体总长 L1 overall length	119.5	132.5	144.5	156.5	169.5	182	194	212	229.5	258.7	286.5	314
L3箱体长度 L3 body length	38.5	51.5	63.5	46.5	59.5	72	60	78	95.5	73.7	101.5	129
L12总高 L12 overall height	68			93			109.5			145.5		
输出端 Output												
L4出轴长度 L4 output shaft length	26			35			40			55		
L5出轴长至轴肩 L5 output length to the shaft shoulder	24			30.5			36			50		
L6键长度 L6 key length	16			25			28			40		
L7键至轴末端长 L7 key length to the shaft end	2.5			2.5			4			5		
L8定位凸台长度 L8 spigot length	2			3			3			4		
L11法兰厚度 L11 flange thickness	6			8			10			15		
D4出轴直径 D4 output shaft diameter	ø10 h7			ø14h7			ø20h7			ø25h7		
D5轴肩直径 D5 shaft shoulder diameter	ø12			ø17			ø25			ø35		
D6定位凸台直径 D6 spigot diameter	ø26			ø50			ø80			ø110		
D7齿轮箱端面 gear box section	□45			□60			□90			ø120		
D8安装孔分布圆 D8 mounting hole distribution circle	ø50			ø70			ø100			ø130		
D9法兰安装孔 D9 flange mounting hole	ø3.5			ø5.5			ø6.5			ø8.5		
B1键宽 B1 key width	3			5			6			8		
H1键高 H1 key height	11.2			16			22.5			28		
G3中心螺纹孔 G3 center screw hole	M3x9			M5x12			M6x16			M10x22		
输入端 Input												
L2输入法兰长度 L2 input flange length	19			23			26.5			27		
L9电机轴长度 L9 motor shaft length	25			30			35			45		
L10定位凸台深度 L10 spigot depth	3			2.5			3.5			3.5		
D1安装孔分布圆 D1 hole circle	ø46			ø70			ø100			ø115		
D2定位凸台直径 D2 spigot diameter	ø30 H7			ø50 H7			ø80 H7			ø95 H7		
D3输入轴轴径 D3 input shaft diameter	ø8 H7			ø14 H7			ø16 H7			ø19 H7		
G1安装螺纹孔x深度 G1 mounting screw hole x depth	M4x10			M5x12			M6x15			M8x20		
Q3输入法兰 Q3 input flange	□40			□60			□90			□115		

※输入端尺寸可根据电机尺寸制作。
※Input size made according to motor size.

VR系列减速机机种、机型标识说明
TYPE AND MODEL NUMBER

剖视图 SECTIONAL DRAWING



① 输出轴 Output shaft
② 油封 Seal for the output shaft
③ 输出轴前轴承 Bearing for the output shaft
④ 行星轮 Planetary gear
⑤ 太阳轮 Sunwheel
⑥ 前盖 Front cover
⑦ 输出轴后轴承 Bearing for the output shaft
⑧ 油封 Seal for the input shaft
⑨ 输入轴轴承 Bearing for the input shaft
⑩ 精密装夹系统 Precision clamping system
⑪ 后盖 rear cover

■ 机种、机型标识说明 Type and model number

VR减速机 VR Reducers						伺服电机Servo Motor		
VR	S	F -	□	- 20	D -	750 -	□	- □
①	②	③	④	⑤	⑥	⑦	⑧	⑨

① VR系列减速机的称呼 VR Reducer Model

② 输入部型式:
S: 夹具紧固方式(不论马达轴有键槽还是无键槽(请参照P.46)均可使用<D形轴不适用>)※1
也可采用以下安装方式:
K: 偶合(直轴、带键槽)※2。
A: 适配器方式(欲知详情请与本公司联系)。
※1 只有K型可与D形轴连接。
※2 采用特别订购方式。欲知详情请与本公司联系。

Input part type:
S: clamp fastening mode (Use ful whatever motor shaft with keyway or without keyway (See 46 page.) / (<D cut unavailable>)※1
Can adopt followiing assembly way:
K : Coupling(straight shaft, key slot)※2
A : Adaptor mode(For details, contact us.)
※1 D cut is only compatible with K type.
※2 Response only to a special order. For more details, contact us.

③ 安装方式和输出轴方向 F：法兰型(安装方向自由) D：带D法兰型(安装方向自由)
Assembly mode and output shaft direction / F: flange type, free assembly direction D: D flange type, free assembly direction

④ 减速机规格: 无标记: 标准 PB: 高精度型 LB: 精密型
Reducer spec. / no symbol: Standard PB: High precision type LB: Low-backlash type

■精度Amount of backlash

减速机段位号 Reducertype no.	VR-□(标准型) Standard type	VR-LB(精密型) Low-backlash type	VR-PB(高精密型) High precision type
B段Type	0.25°(15分arc-min)	0.166°(10分arc-min)	0.05°(3分arc-min)
C段Type	0.25°(15分arc-min)	0.08°(5分arc-min)	0.05°(3分arc-min)
D段Type	0.25°(15分arc-min)	0.08°(5分arc-min)	0.05°(3分arc-min)
E段Type	0.25°(15分arc-min)	0.08°(5分arc-min)	0.05°(3分arc-min)

※输出轴负荷量为容许输出扭矩的±5%时的值。

⑤ 减速比: 单级型: 3, 4, 5, 6, 7, 8, 9, 10 两级型: 15, 20, 25, 35, 45, 81
Reduction ratio / 1 stage types 3, 4, 5, 6, 7, 8, 9, 10 2 stage types 15, 20, 25, 35, 45, 81

⑥ 减速机段位号 Reducer type no.

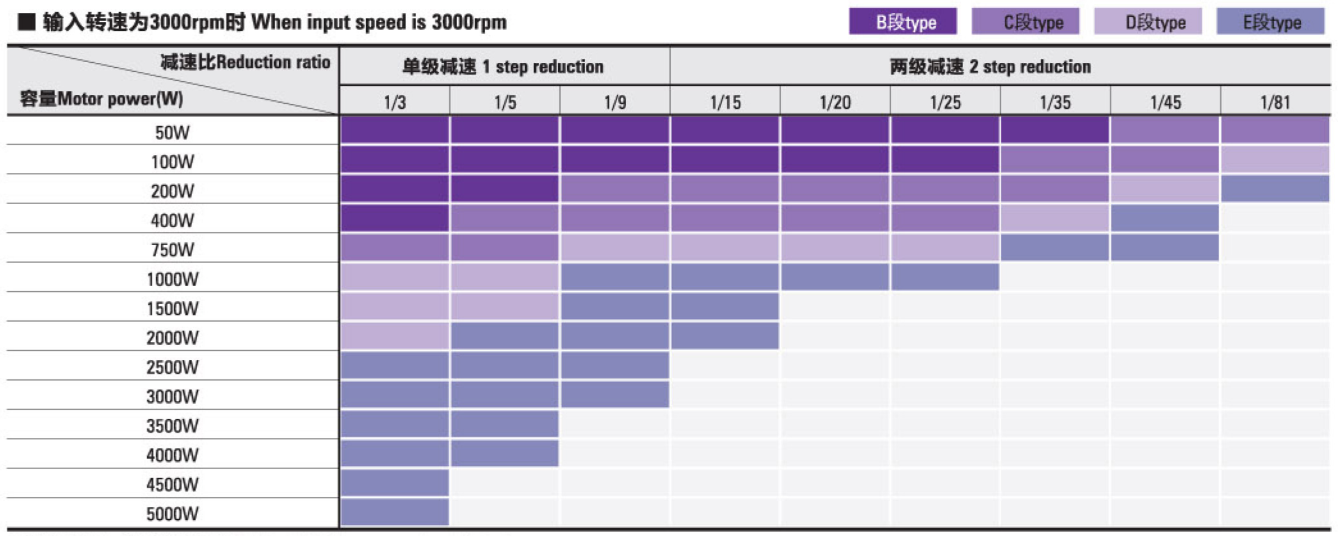
⑦ 适用伺服马达功率(W) Applicable servo motor power(W)

⑧ 生产厂家名称 Manufacturer name

⑨ 型号(请务必告知我们马达的生产厂家和产品型号)
Type (Lnform us manufacturer name and motor type.)

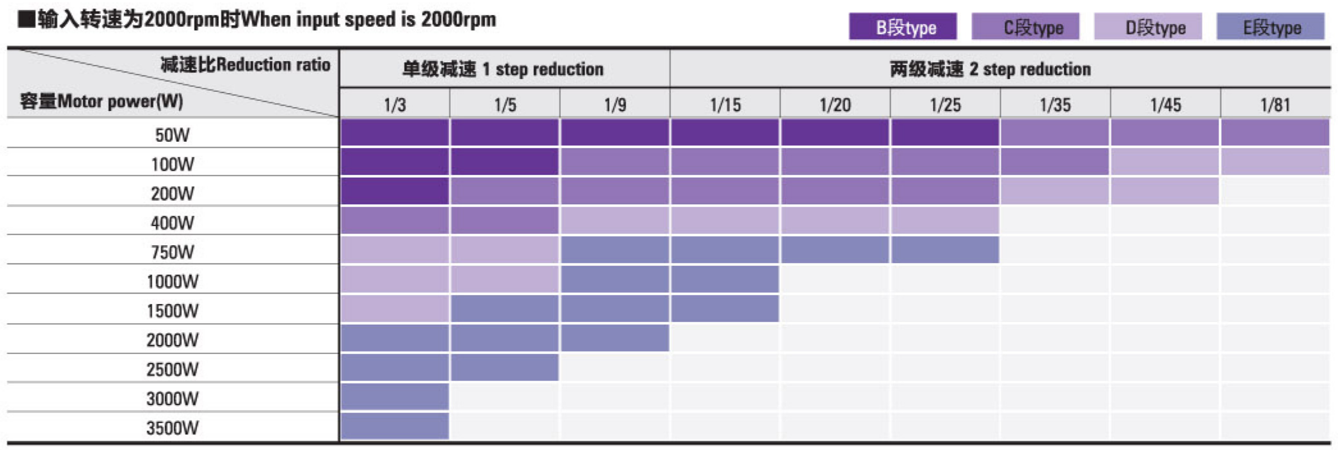
减速比、段位号
REDUCTION RATIO & TYPE NUMBER

■ 输入转速为3000rpm时 When input speed is 3000rpm



注1）全部为斜齿轮适用范围 Note 1) All corresponding to helical gear

■输入转速为2000rpm时When input speed is 2000rpm



注1）全部为斜齿轮适用范围
Note 1) All corresponding to helical gear

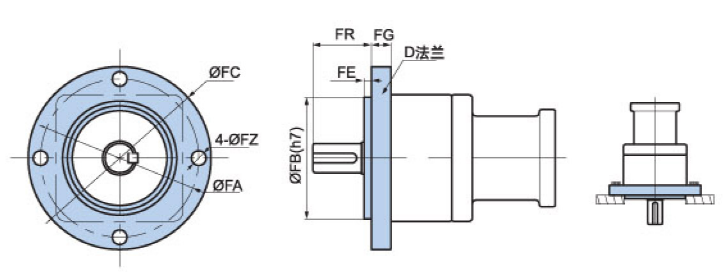
※以下为限扭矩机种
B段: 1/5减速(100W)
C段: 1/81减速(50W)
D段: 1/3减速(1500W)、1/45减速(200W)、1/81减速(100W)
E段: 1/3减速(3500W)、1/25减速(750W)

※Torque is limited to the following types:
B type : 1/5 reduction (100W)
C type : 1/81 reduction (50W)
D type : 1/3 reduction (1500W), 1/45 reduction (200W), 1/81 reduction (100W)
E type : 1/3 reduction (3500W), 1/25 reduction (250W)

■ 关于润滑油About lubricant

●润滑: 润滑脂 ●更换: 不可 ● Lubrication: grease ● Replacement: Not available

■ 带D法兰型的尺寸图 Dimensional drawing of D flange type



单位Unit: mm

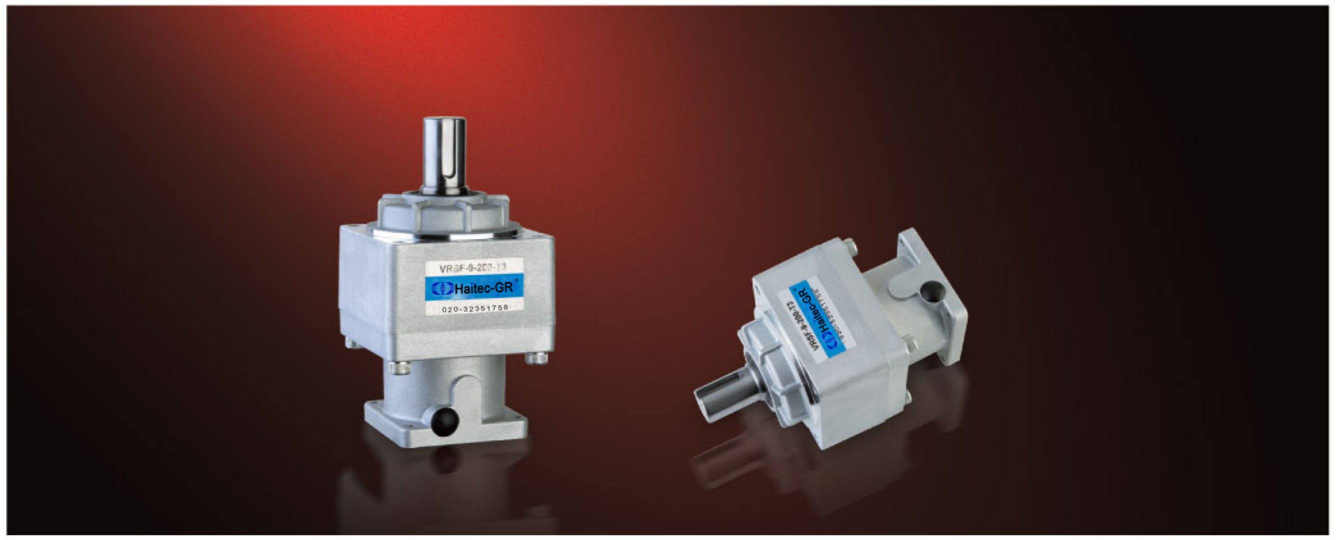
段号Type no.	FG	FR	FE	FB	FC	FA	FZ
B	8	24	3	50	75	65	6
C	12	33.5	3	72	110	95	7
D	13	48	5	90	134	115	8.8

※向上图那样的安装，请指定带D法兰(另卖)。另外，D法兰也可另外安装。
※In case of assembly as mentioned in the above figure, designate D flange(separate selling). Also, the D flange may be assembly separately.

■ 输出轴端面丝锥孔加工(可选)Processing of output shaft tab (option)

B段: M5X10 C段: M6X12（或M8X16） D段: M8X16（或M6X12） E段: M10X20
B type : M5X10 C type: M6X12(or M8X16) D type: M8X16(or M6X12) E type: M10X20

性能表（输入转速为3,000rpm时）
PERFORMANCE TABLE (WHEN INPUT SPEED IS 3000RPM)



■性能表 Performance Table

减速比 Reduction ratio	型号 Type				输出轴转速 Output shaft speed	额定输出扭矩 Standard output torque	瞬间最大输出扭矩 Instantaneous max. output torque	容许径向负荷 Permissible radial load	容许轴向负荷 Permissible axial load	输入轴换算内部惯性力矩 Internal moment ofinertia of input shaftconversion	容许输出扭矩 Permissible output torque	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque
	机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	(rpm)	(N·m)	(N·m)	(N)	(N)	($10^{-4}\times kg\cdot m^2$)	(N·m)	(N·m)
1/3	VR□F	-3	B	-50	1000	0.255	0.784	392	196	0.0575	3.43	10.3
	VR□F	-3	B	-100	1000	0.715	2.06	392	196	0.0575	3.43	10.3
	VR□F	-3	B	-200	1000	1.47	4.51	392	196	0.135	3.43	10.3
	VR□F	-3	B	-400	1000	3.43	10.3	392	196	0.145	3.43	10.3
	VR□F	-3	C	-750	1000	6.37	19.3	784	392	0.913	6.86	20.6
	VR□F	-3	D	-1000	1000	7.55	22.8	882	441	2.43	18.3	54.9
	VR□F	-3	D	-1500	1000	12.3	37.1	882	441	2.43	18.3	54.9
	VR□F	-3	D	-2000	1000	17.2	51.5	882	441	2.43	18.3	54.9
	VR□F	-3	E	-2500	1000	19.0	57.2	1370	686	5.55	44.1	132
	VR□F	-3	E	-3000	1000	23.7	71.2	1370	686	5.50	44.1	132
	VR□F	-3	E	-3500	1000	28.3	85.2	1370	686	5.50	44.1	132
	VR□F	-3	E	-4000	1000	33.1	99.0	1370	686	5.78	44.1	132
	VR□F	-3	E	-4500	1000	37.7	113	1370	686	5.78	44.1	132
	VR□F	-3	E	-5000	1000	42.9	128	1370	686	5.78	44.1	132
1/5	VR□F	-5	B	-50	600	0.510	1.47	490	245	0.0400	1.57	4.70
	VR□F	-5	B	-100	600	1.18	3.72	490	245	0.0400	1.57	4.70
	VR□F	-5	B	-200	600	2.65	8.04	490	245	0.118	2.84	8.53
	VR□F	-5	C	-400	600	5.39	16.2	980	490	0.363	6.57	19.7
	VR□F	-5	C	-750	600	10.7	32.1	980	490	0.713	11.5	34.3
	VR□F	-5	D	-1000	600	13.4	40.5	1080	539	1.85	23.5	70.6
	VR□F	-5	D	-1500	600	21.5	64.4	1080	539	1.85	23.5	70.6
	VR□F	-5	E	-2000	600	23.8	71.5	1670	833	3.50	56.8	171
	VR□F	-5	E	-2500	600	31.8	95.5	1670	833	3.50	56.8	171
	VR□F	-5	E	-3000	600	39.6	119	1670	833	3.48	56.8	171
	VR□F	-5	E	-3500	600	47.2	141	1670	833	3.48	56.8	171
	VR□F	-5	E	-4000	600	55.3	166	1670	833	3.75	56.8	171
1/9	VR□F	-9	B	-50	333	0.921	2.74	588	294	0.0350	2.35	7.25
	VR□F	-9	B	-100	333	2.25	6.86	588	294	0.0350	2.35	7.25
	VR□F	-9	C	-200	333	3.72	11.3	1180	588	0.275	9.70	29.2
	VR□F	-9	C	-400	333	9.51	28.5	1180	588	0.275	9.70	29.2
	VR□F	-9	D	-750	333	18.2	54.7	1470	735	0.650	18.2	54.7
	VR□F	-9	E	-1000	333	20.0	60.1	1960	980	2.81	73.5	221
	VR□F	-9	E	-1500	333	34.3	103	1960	980	2.81	73.5	221
	VR□F	-9	E	-2000	333	48.6	146	1960	980	2.81	73.5	221
	VR□F	-9	E	-2500	333	60.8	182	1960	980	2.81	73.5	221
	VR□F	-9	E	-3000	333	73.0	219	1960	980	2.77	73.5	221

注1) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注2) 最高输入转速为5000rpm.正常情况下请将转速控制在3000rpm以下。
注3) 容许径向负荷为输出轴中央部的数值。
注4) 全部为斜齿轮适用范围。

Note 1) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 2) The max. input speed is 5000rpm. Usually set to 3000rpm or less.
Note 3) The permissible radial load is indicated on the center of the output shaft.
Note 4) All values are within the range corresponding to helical gear.

性能表（输入转速为3,000rpm时）
PERFORMANCE TABLE (WHEN INPUT SPEED IS 3000RPM)

■性能表 Performance Table

减速比 Reduction ratio	型号 Type				输出轴转速 Output shaft speed	额定输出扭矩 Standard output torque	瞬间最大输出扭矩 Instantaneous max. output torque	容许径向负荷 Permissible radial load	容许轴向负荷 Permissible axial load	输入轴换算内部惯性力矩 Internal moment ofinertia of input shaftconversion	容许输出扭矩 Permissible output torque	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque
	机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	(rpm)	(N·m)	(N·m)	(N)	(N)	($10^{-4}\times kg\cdot m^2$)	(N·m)	(N·m)
1/15	VR□F	-15	B	-50	200	1.67	5.00	784	392	0.0350	4.02	12.2
	VR□F	-15	B	-100	200	3.72	11.4	784	392	0.0350	4.02	12.2
	VR□F	-15	C	-200	200	6.27	18.8	1470	735	0.300	16.2	48.6
	VR□F	-15	C	-400	200	15.8	47.5	1470	735	0.300	16.2	48.6
	VR□F	-15	D	-750	200	30.4	91.2	1760	882	0.700	30.4	91.2
	VR□F	-15	E	-1000	200	33.3	100	2350	1180	1.95	91.4	274
	VR□F	-15	E	-1500	200	57.2	172	2350	1180	2.80	91.4	274
	VR□F	-15	E	-2000	200	81.0	243	2350	1180	2.80	91.4	274
1/20	VR□F	-20	B	-50	150	2.21	6.63	804	402	0.0340	5.00	15.0
	VR□F	-20	B	-100	150	5.00	15.0	804	402	0.0340	5.00	15.0
	VR□F	-20	C	-200	150	8.69	26.1	1570	785	0.294	21.1	63.3
	VR□F	-20	C	-400	150	21.1	63.3	1570	785	0.294	21.1	63.3
	VR□F	-20	D	-750	150	40.6	122	1910	955	0.690	40.6	122
1/25	VR□F	-25	B	-50	120	2.74	8.33	882	441	0.0325	4.02	12.2
	VR□F	-25	B	-100	120	6.27	19.0	882	441	0.0325	6.27	19.0
	VR□F	-25	C	-200	120	11.1	33.3	1670	833	0.288	21.7	64.9
	VR□F	-25	C	-400	120	26.4	79.2	1670	833	0.288	26.4	79.2
	VR□F	-25	D	-750	120	50.7	152	2060	1030	0.680	50.7	152
	VR□F	-25	E	-1000	120	55.7	167	2650	1320	1.88	65.4	196
1/35	VR□F	-35	B	-50	85	3.84	11.5	882	441	0.0300	3.84	11.5
	VR□F	-35	C	-100	85	7.24	21.7	1670	833	0.0650	13.9	41.7
	VR□F	-35	C	-200	85	15.5	46.6	1670	833	0.262	15.5	46.6
	VR□F	-35	D	-400	85	37.0	111	2060	1030	0.269	37.0	111
	VR□F	-35	E	-750	85	71.0	213	3430	1715	0.473	71.0	213
1/45	VR□F	-45	C	-50	66	3.86	11.6	1670	833	0.0285	9.50	28.6
	VR□F	-45	C	-100	66	9.31	28.0	1670	833	0.0285	9.50	28.6
	VR□F	-45	D	-200	66	21.1	63.5	2060	1030	0.0256	28.3	85.2
	VR□F	-45	E	-400	66	47.5	142.5	3520	1760	0.245	57.0	171
	VR□F	-45	E	-750	66	91.3	274	3520	1760	1.77	91.3	274
1/81	VR□F	-81	C	-50	37	7.02	20.8	1670	833	0.0270	9.70	29.2
	VR□F	-81	D	-100	37	14.0	42.0	2060	1030	0.0300	17.8	53.5
	VR□F	-81	E	-200	37	36.1	108.3	3530	1765	0.240	43.3	129.9

注1) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注2) 最高输入转速为5000rpm.正常情况下请将转速控制在3000rpm以下。
注3) 容许径向负荷为输出轴中央部的数值。
注4) 全部为斜齿轮适用范围。

Note 1) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 2) The max. input speed is 5000rpm. Usually set to 3000rpm or less.
Note 3) The permissible radial load is indicated on the center of the output shaft.
Note 4) All values are within the range corresponding to helical gear.

性能表（输入转速为2,000rpm时）
PERFORMANCE TABLE(WHEN INPUT SPEED IS 2000RPM)

标准型、LB(精度型)、PB(高精度型)均为相同的规格The same specification applies to all of standard type, LB(low backlash), and PB(high precision type).

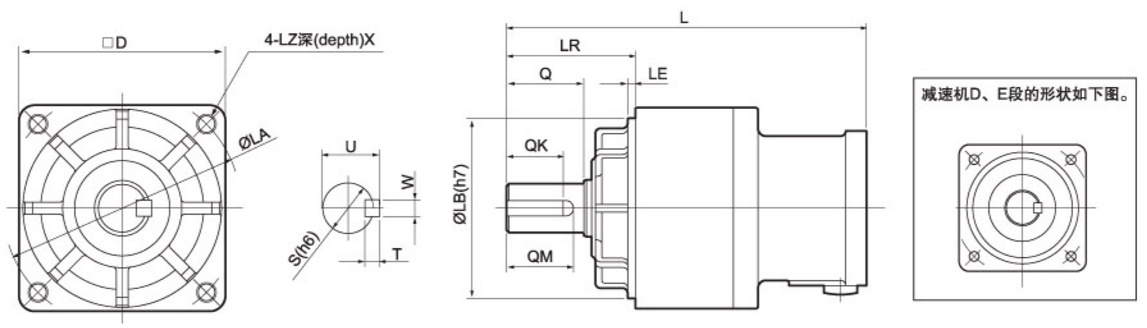
■性能表 Performance Table

减速比 Reduction ratio	型号 Type 机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	输出轴转速 Output shaft speed (rpm)	额定输出扭矩 Standard output torque (N·m)	瞬间最大输出扭矩 Instantaneous max. output torque (N·m)	容许径向负荷 Permissible radial load (N)	容许轴向负荷 Permissible axial load (N)	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion (10^{-4}×kg·m²)	容许输出扭矩 Permissible output torque (N·m)	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque (N·m)
1/3	VR□F	-3	B	-50	666	0.477	1.43	450	225	0.0575	3.43	10.3
	VR□F	-3	B	-100	666	1.05	3.15	450	225	0.135	3.43	10.3
	VR□F	-3	B	-200	666	2.48	7.45	450	225	0.145	3.43	10.3
	VR□F	-3	C	-400	666	5.01	15.0	900	450	0.913	6.86	20.6
	VR□F	-3	D	-750	666	8.73	26.2	1010	505	2.43	18.3	54.9
	VR□F	-3	D	-1000	666	12.3	37.1	1010	505	2.43	18.3	54.9
	VR□F	-3	D	-1500	666	18.3	54.9	1010	505	2.43	18.3	54.9
	VR□F	-3	E	-2000	666	23.7	71.2	1570	785	5.50	44.1	132
	VR□F	-3	E	-2500	666	30.8	92.5	1570	785	5.50	44.1	132
	VR□F	-3	E	-3000	666	37.7	113	1570	785	5.50	44.1	132
	VR□F	-3	E	-3500	666	44.1	132	1570	785	5.78	44.1	132
1/5	VR□F	-5	B	-50	400	0.795	2.39	560	280	0.0400	1.57	4.70
	VR□F	-5	B	-100	400	1.57	4.70	560	280	0.118	1.57	4.70
	VR□F	-5	C	-200	400	3.82	11.5	1120	560	0.363	6.57	19.7
	VR□F	-5	C	-400	400	8.35	25.1	1120	560	0.713	11.5	34.3
	VR□F	-5	D	-750	400	15.5	46.5	1230	615	1.85	23.5	70.6
	VR□F	-5	D	-1000	400	21.5	64.4	1230	615	1.85	23.5	70.6
	VR□F	-5	E	-1500	400	27.8	83.5	1900	950	3.50	56.8	171
	VR□F	-5	E	-2000	400	39.6	119	1900	950	3.48	56.8	171
	VR□F	-5	E	-2500	400	51.4	154	1900	950	3.75	56.8	171
1/9	VR□F	-9	B	-50	222	1.57	4.72	670	335	0.0350	2.35	7.25
	VR□F	-9	C	-100	222	2.35	7.04	1340	670	0.275	9.70	29.2
	VR□F	-9	C	-200	222	6.64	19.9	1340	670	0.275	9.70	29.2
	VR□F	-9	D	-400	222	14.0	41.9	1680	840	0.650	18.2	54.7
	VR□F	-9	E	-750	222	23.6	70.9	2240	1120	2.81	73.5	221
	VR□F	-9	E	-1000	222	34.3	103	2240	1120	2.81	73.5	221
	VR□F	-9	E	-1500	222	53.7	161	2240	1120	2.81	73.5	221
	VR□F	-9	E	-2000	222	73.0	219	2240	1120	2.77	73.5	221
1/15	VR□F	-15	B	-50	133	2.62	7.87	882	441	0.0350	4.02	12.2
	VR□F	-15	C	-100	133	3.91	11.7	1670	833	0.300	16.2	48.6
	VR□F	-15	C	-200	133	11.1	33.2	1670	833	0.300	16.2	48.6
	VR□F	-15	D	-400	133	23.3	69.8	2020	1010	0.700	30.4	91.2
	VR□F	-15	E	-750	133	39.4	118	2650	1320	2.80	91.4	274
	VR□F	-15	E	-1000	133	57.2	172	2650	1320	2.80	91.4	274
	VR□F	-15	E	-1500	133	91.3	274	2650	1320	2.80	91.4	274
1/20	VR□F	-20	B	-50	100	3.50	10.5	910	455	0.0340	5.00	15.0
	VR□F	-20	C	-100	100	5.73	17.2	1790	895	0.294	21.1	63.3
	VR□F	-20	C	-200	100	14.8	44.4	1790	895	0.294	21.1	63.3
	VR□F	-20	D	-400	100	31.0	93.1	2180	1090	0.690	40.6	122
1/25	VR□F	-25	B	-50	80.0	4.37	13.1	882	441	0.0325	6.27	19.0
	VR□F	-25	C	-100	80.0	7.16	21.5	1670	833	0.288	21.7	64.9
	VR□F	-25	C	-200	80.0	18.5	55.4	1670	833	0.288	21.7	64.9
	VR□F	-25	D	-400	80.0	38.8	116	2060	1030	0.680	50.7	152
	VR□F	-25	E	-750	80.0	65.4	196	2650	1320	1.88	65.4	196
1/35	VR□F	-35	C	-50	57	4.43	13.3	1900	950	0.262	15.5	46.6
	VR□F	-35	C	-100	57	12.7	38.1	1900	950	0.262	15.5	46.6
	VR□F	-35	D	-200	57	22.0	66.0	2340	1170	0.269	37.0	111
1/45	VR□F	-45	C	-50	44.4	5.80	17.4	1670	833	0.0285	9.50	28.6
	VR□F	-45	D	-100	44.4	14.0	42.1	2060	1030	0.0285	28.3	85.2
	VR□F	-45	D	-200	44.4	28.3	85.2	2060	1030	0.0285	28.3	85.2
1/81	VR□F	-81	C	-50	24.6	9.70	29.2	1670	833	0.0270	9.70	29.2
	VR□F	-81	D	-100	24.6	17.8	53.5	2060	1030	0.0300	17.8	53.5

注1) 输入轴换算内部惯性力矩仅为减速机的数值，不包括马达的惯性力矩。请将其作为参考值。
注2) 容许径向负荷为输出轴中央部的数值。
注3) 全部为斜齿轮适用范围。
Note 1) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 2) The permissible radial load is indicated on the center of the output shaft.
Note 3) All values are within the range corresponding to helical gear.

尺寸图（细长型VRSF系列）
DIMENSIONAL DRAWING & TABLE (CYLINDER TYPE-MATCHED VRSF SERIES)

机械参数 DIMENSIONS



■ VR同芯轴型减速机尺寸表 Dimensional Table For VR Concentric Shaft Reducer　　单位Unit: mm

型号 Type 机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	全长 Total length L 松下电器生产 Panasonic-made MSMA	安川电机生产 Yaskawa-made SGMASH SGMSH	三菱电机生产 Mitsubishi-made HC-KFS HC-RFS	输出轴 Output shaft LR	S	Q	QM	QK	W x U	T	法兰 Flange D	LB	LE	LA	LZ	X
VRSF	3·5·9	B	50	99.5															
VRSF	15·20·25·35	B	50	110															
VRSF	3·5·9	B	100	99.5			32	12	20	18	16	4x13.5	4	52	50	3	60	M5	12
VRSF	15·20·25	B	100	110															
VRSF	3·5	B	200	104.5															
VRSF	3	B	400																
VRSF	45·81	C	50	142															
VRSF	35	C	100	150															
VRSF	45	C	100	142															
VRSF	9	C	200	139.5			50	19	30	26	22	6x21.5	6	78	70	3	90	M6	20
VRSF	15·20·25·35	C	200	150															
VRSF	5·9	C	400	139.5															
VRSF	15·20·25	C	400	150															
VRSF	3·5	C	750	143.5															
VRSF	81	D	100	158															
VRSF	45	D	200	165															
VRSF	35	D	400																
VRSF	9	D	750	158.5			61	24	40	35	30	8x27	7	98	90	5	115	M8	20
VRSF	15·20·25	D	750	171															
VRSF	3·5	D	1000	177															
VRSF	3·5	D	1500																
VRSF	3	D	2000																
VRSF	81	E	200	210															
VRSF	45	E	400																
VRSF	35	E	750																
VRSF	45	E	750	235															
VRSF	9	E	1000	215															
VRSF	15·25	E	1000	235															
VRSF	9	E	1500	215															
VRSF	15	E	1500	235															
VRSF	5·9	E	2000	215			75	32	55	52	45	10x35	8	125	110	5	135	M10	20
VRSF	15	E	2000	235															
VRSF	3·5·9	E	2500	215	-	-													
VRSF	3·5·9	E	3000	215	225	-													
VRSF	3·5	E	3500	215	-	225													
VRSF	3·5	E	4000	225	225	-													
VRSF	3	E	4500	225	-	-													
VRSF	3	E	5000	225															

注1) 基准机种(马达对应表记载系列)以外的马达，请咨询。（因为根据马达安装的不同法兰尺寸可能不同）
注2) 输出轴旋转方向与马达输入旋转方向相同。
注3) 全部为斜齿轮适用范围。
Note 1) Please inquire to us if motor model isn't standard (Matching motor list).(The flange dimension may be different if motor assembly dimension is different.)
Note 2) Rotation of the output shaft is in the same direction as that of motor input.
Note 3) All values are within the range corresponding to helical gear.

50W 尺寸图与性能表
50W DIMENSIONAL DRAWING & PERFORMANCE TABLE

■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

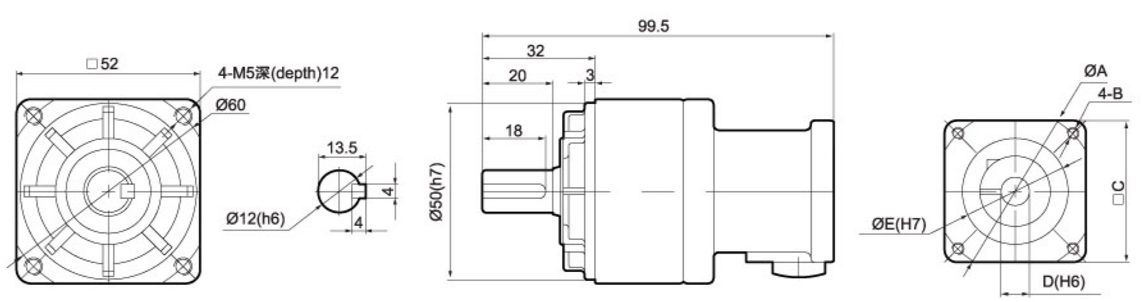
额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type 机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	输出轴转速 Output shaft speed (rpm)	额定输出扭矩 Standard output torque (N·m)	瞬间最大输出扭矩 Instantaneous max. output torque (N·m)	容许径向负荷 Permissible radial load (N)	容许轴向负荷 Permissible axial load (N)	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion ($10^{-4}\times kg\cdot m^2$)	容许输出扭矩 Permissible output torque (N·m)	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque (N·m)
50W	1/3	VRSF	3	B	50	1000	0.255	0.784	392	196	0.0575	3.43	10.3
	1/5	VRSF	5	B	50	600	0.510	1.47	490	245	0.0400	1.57	4.70
	1/9	VRSF	9	B	50	333	0.921	2.74	588	294	0.0350	2.35	7.25
	1/15	VRSF	15	B	50	200	1.67	5.00	784	392	0.0350	4.02	12.2
	1/20	VRSF	20	B	50	150	2.21	6.63	804	402	0.0340	5.00	15.0
	1/25	VRSF	25	B	50	120	2.74	8.33	882	441	0.0325	4.02	12.2
	1/35	VRSF	35	B	50	85	3.84	11.5	882	441	0.0300	3.84	11.5
	1/45	VRSF	45	C	50	66	3.86	11.6	1670	833	0.0285	9.50	28.6
	1/81	VRSF	81	C	50	37	7.02	20.8	1670	833	0.0270	9.70	29.2

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。

Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3B·5B·9B-50



●概略重量0.55kg
●Rough weight 0.55kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

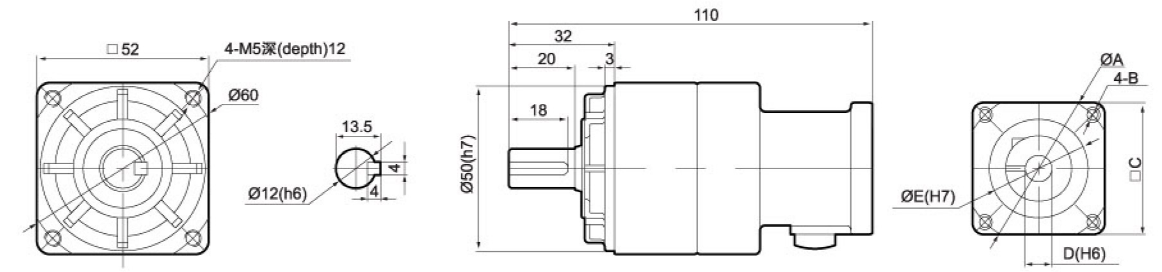
■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	45	M3	38	8	30
TYPE 2	46	M4	40	6	30
TYPE 3	46	M4	40	8	30

50W 尺寸图与性能表
50W DIMENSIONAL DRAWING & PERFORMANCE TABLE

■ 尺寸图 Dimensional Drawing

VRSF-15B·20B·25B·35B-50



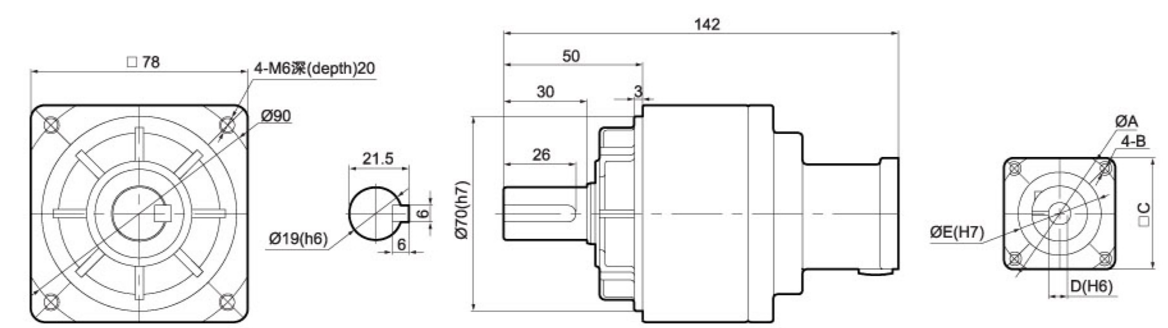
●概略重量0.7kg
●Rough weight 0.7kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	45	M3	38	8	30
TYPE 2	46	M4	40	6	30
TYPE 3	46	M4	40	8	30

■ 尺寸图 Dimensional Drawing

VRSF-45C·81C-50



●概略重量1.7kg
●Rough weight 1.7kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	45	M3	38	8	30
TYPE 2	46	M4	40	6	30
TYPE 3	46	M4	40	8	30

■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

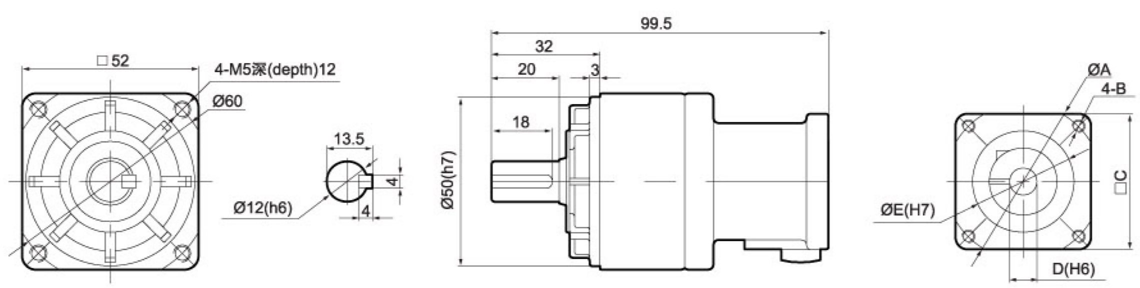
额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type 机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	输出轴转速 Output shaft speed (rpm)	额定输出扭矩 Standard output torque (N·m)	瞬间最大输出扭矩 Instantaneous max. output torque (N·m)	容许径向负荷 Permissible radial load (N)	容许轴向负荷 Permissible axial load (N)	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion (10^{-4}×kg·m²)	容许输出扭矩 Permissible output torque (N·m)	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque (N·m)
100W	1/3	VRSF	3	B	100	1000	0.715	2.06	392	196	0.0575	3.43	10.3
	1/5	VRSF	5	B	100	600	1.18	3.72	490	245	0.0400	1.57	4.70
	1/9	VRSF	9	B	100	333	2.25	6.86	588	294	0.0350	2.35	7.25
	1/15	VRSF	15	B	100	200	3.72	11.4	784	392	0.0350	4.02	12.2
	1/20	VRSF	20	B	100	150	5.00	15.0	804	402	0.0340	5.00	15.0
	1/25	VRSF	25	B	100	120	6.27	19.0	882	441	0.0325	6.27	19.0
	1/35	VRSF	35	C	100	85	7.24	21.7	1670	833	0.0650	13.9	41.7
	1/45	VRSF	45	C	100	66	9.31	28.0	1670	833	0.0285	9.50	28.6
	1/81	VRSF	81	D	100	37	14.0	42.0	2060	1030	0.0300	17.8	53.5

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。

Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3B·5B·9B-100

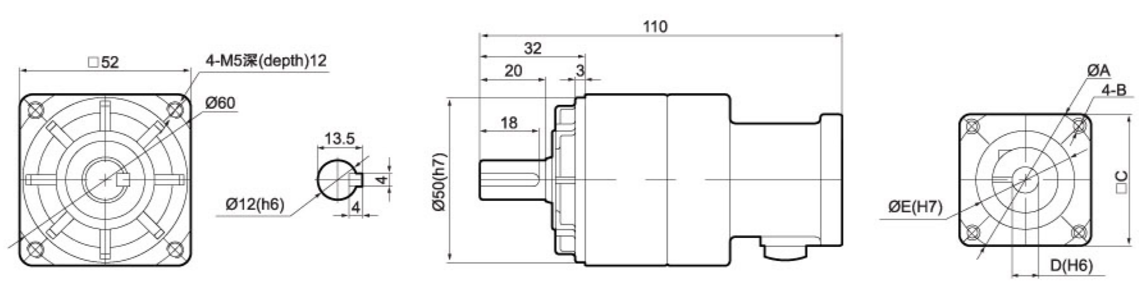


●概略重量0.55kg
●Rough weight 0.55kg
●TYPE1~3的详细情况请参照P.44
●For details of TYPE1~3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	45	M3	38	8	30
TYPE 2	46	M4	40	8	30
TYPE 3	46	M4	40	8	30

VRSF-15B·20B·25B-100



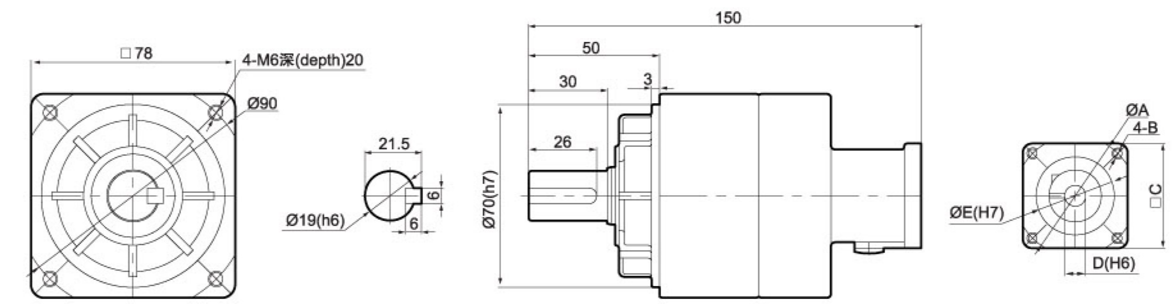
●概略重量0.7kg
●Rough weight 0.7kg
●TYPE1~3的详细情况请参照P.44
●For details of TYPE1~3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	45	M3	38	8	30
TYPE 2	46	M4	40	8	30
TYPE 3	46	M4	40	8	30

■ 尺寸图 Dimensional Drawing

VRSF-35C-100

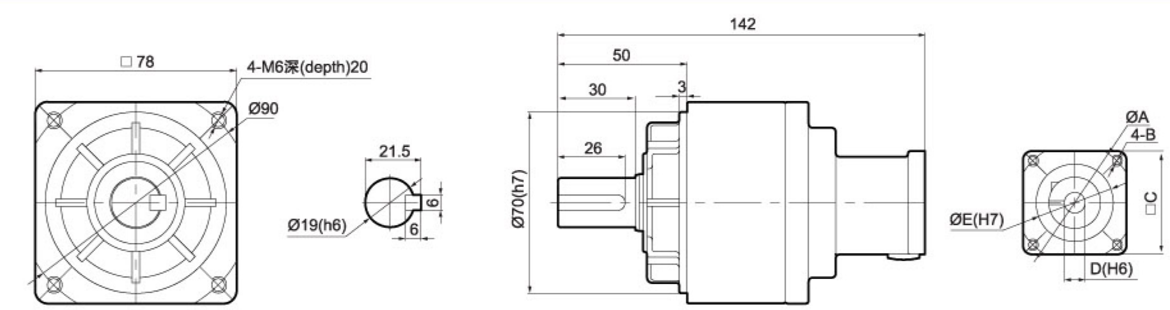


●概略重量2.0kg
●Rough weight 2.0kg
●TYPE1~3的详细情况请参照P.44
●For details of TYPE1~3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	45	M3	38	8	30
TYPE 2	46	M4	40	8	30
TYPE 3	46	M4	40	8	30

VRSF-45C-100

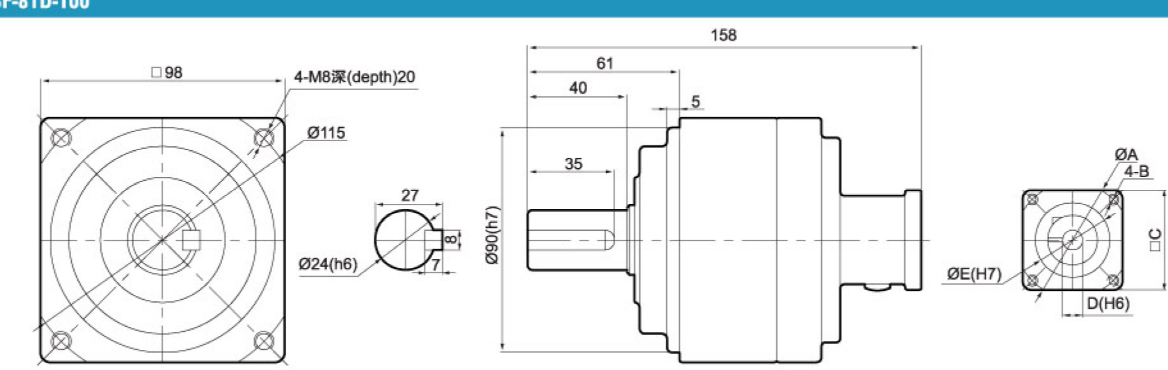


●概略重量1.7kg
●Rough weight 1.7kg
●TYPE1~3的详细情况请参照P.44
●For details of TYPE1~3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	45	M3	38	8	30
TYPE 2	46	M4	40	8	30
TYPE 3	46	M4	40	8	30

VRSF-81D-100



●概略重量3.0kg
●Rough weight 3.0kg
●TYPE1~3的详细情况请参照P.44
●For details of TYPE1~3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	45	M3	38	8	30
TYPE 2	46	M4	40	8	30
TYPE 3	46	M4	40	8	30

■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

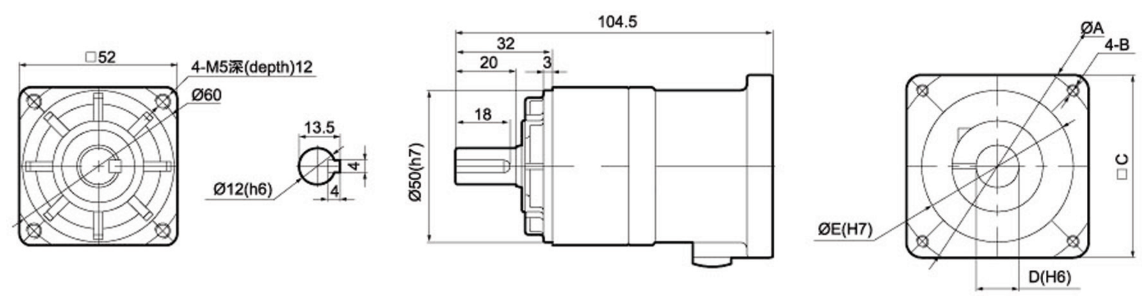
额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type 机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	输出轴转速 Output shaft speed (rpm)	额定输出扭矩 Standard output torque (N·m)	瞬间最大输出扭矩 Instantaneous max. output torque (N·m)	容许径向负荷 Permissible radial load (N)	容许轴向负荷 Permissible axial load (N)	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion ($10^{-4}\times kg\cdot m^2$)	容许输出扭矩 Permissible output torque (N·m)	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque (N·m)
200W	1/3	VRSF	3	B	200	1000	1.47	4.51	392	196	0.135	3.43	10.3
	1/5	VRSF	5	B	200	600	2.65	8.04	490	245	0.118	2.84	8.53
	1/9	VRSF	9	C	200	333	3.72	11.3	1180	588	0.275	9.70	29.2
	1/15	VRSF	15	C	200	200	6.27	18.8	1470	735	0.300	16.2	48.6
	1/20	VRSF	20	C	200	150	8.69	26.1	1570	785	0.294	21.1	63.3
	1/25	VRSF	25	C	200	120	11.1	33.3	1670	833	0.288	21.7	64.9
	1/35	VRSF	35	C	200	85	15.5	46.6	1670	833	0.262	15.5	46.6
	1/45	VRSF	45	D	200	66	21.1	63.5	2060	1030	0.0256	28.3	85.2
	1/81	VRSF	81	E	200	37	36.1	108.3	3530	1765	0.240	43.3	129.9

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。

Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3B·5B-200

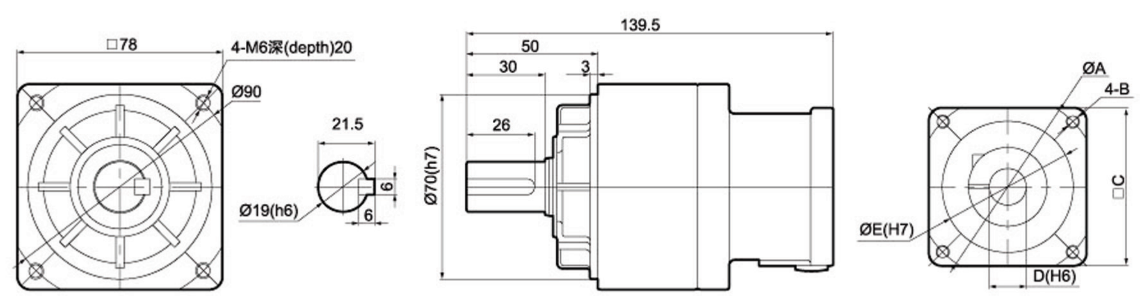


●概略重量0.72kg
●Rough weight 0.72kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	70	M4	60	11	50
TYPE 2	70	M5	60	14	50
TYPE 3	70	M5	60	14	50

VRSF-9C-200



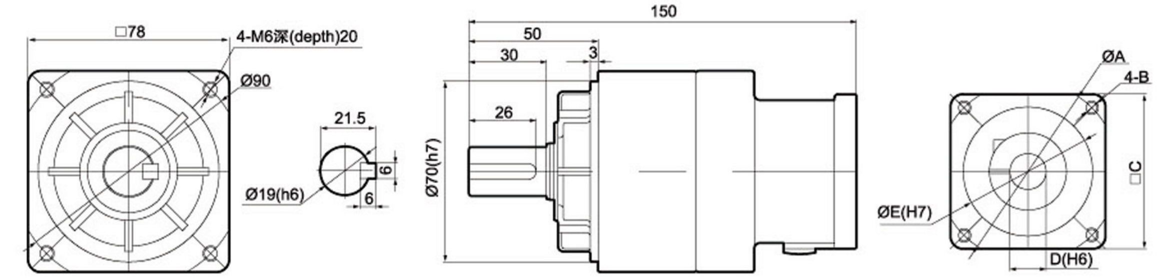
●概略重量1.7kg
●Rough weight 1.7kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	70	M4	60	11	50
TYPE 2	70	M5	60	14	50
TYPE 3	70	M5	60	14	50

■ 尺寸图 Dimensional Drawing

VRSF-15C·20C·25C·35C-200

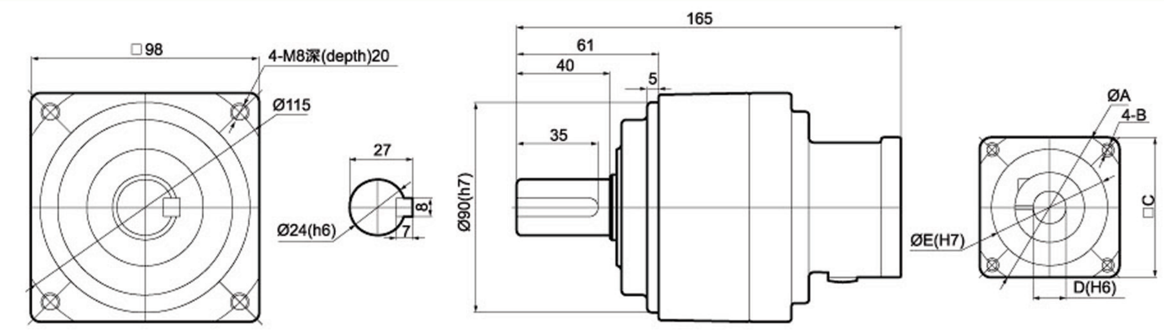


●概略重量2.1kg
●Rough weight 2.1kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	70	M4	60	11	50
TYPE 2	70	M5	60	14	50
TYPE 3	70	M5	60	14	50

VRSF-45D-200

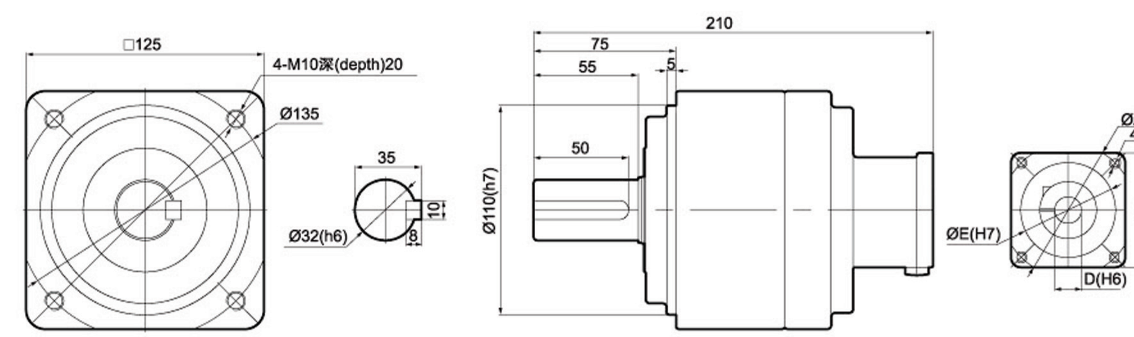


●概略重量3.2kg
●Rough weight 3.2kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	70	M4	60	11	50
TYPE 2	70	M5	60	14	50
TYPE 3	70	M5	60	14	50

VRSF-81E-200



●概略重量3.0kg
●Rough weight 3.0kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	70	M4	60	11	50
TYPE 2	70	M5	60	14	50
TYPE 3	70	M5	60	14	50

400W 尺寸图与性能表
400W DIMENSIONAL DRAWING & PERFORMANCE TABLE

■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

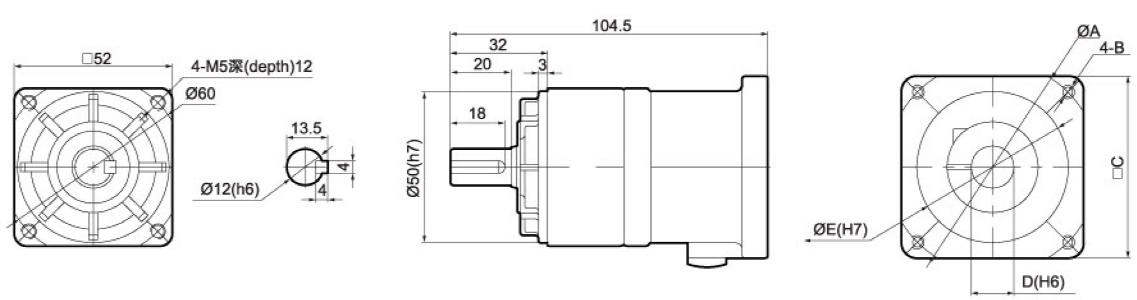
额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type				输出轴转速 Output shaft speed	额定输出扭矩 Standard output torque	瞬间最大输出扭矩 Instantaneous max. output torque	容许径向负荷 Permissible radial load	容许轴向负荷 Permissible axial load	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion	容许输出扭矩 Permissible output torque	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque
		机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	(rpm)	(N·m)	(N·m)	(N)	(N)	(10^{-4}×kg·m²)	(N·m)	(N·m)
400W	1/3	VRSF	3	B	400	1000	3.43	10.3	392	196	0.145	3.43	10.3
	1/5	VRSF	5	C	400	600	5.39	16.2	980	490	0.363	6.57	19.7
	1/9	VRSF	9	C	400	333	9.51	28.5	1180	588	0.275	9.70	29.2
	1/15	VRSF	15	C	400	200	15.8	47.5	1470	735	0.300	16.2	48.6
	1/20	VRSF	20	C	400	150	21.1	63.3	1570	785	0.294	21.1	63.3
	1/25	VRSF	25	C	400	120	26.4	79.2	1670	833	0.288	26.4	79.2
	1/35	VRSF	35	D	400	85	37.0	111	2060	1030	0.269	37.0	111
	1/45	VRSF	45	E	400	66	47.5	142.5	3520	1760	0.245	57	171

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。

Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3B-400

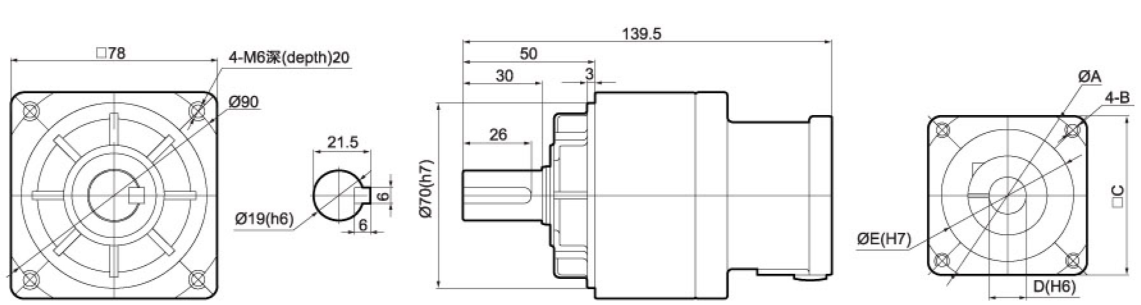


●概略重量0.71kg
●Rough weight 0.71kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	70	M4	60	14	50
TYPE 2	70	M5	60	14	50
TYPE 3	70	M5	60	14	50

VRSF-5C-9C-400



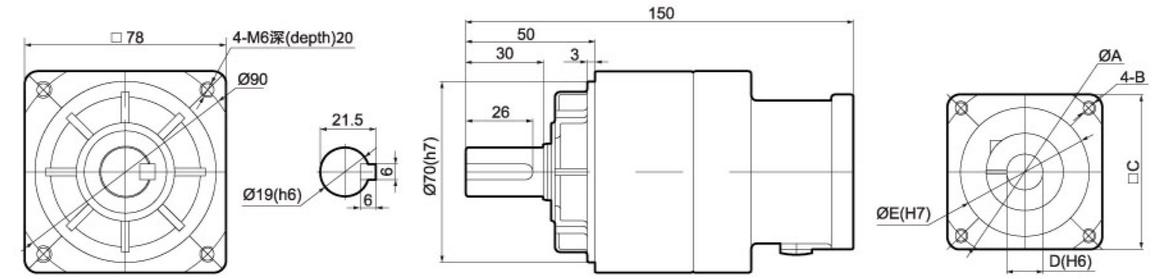
●概略重量1.7kg
●Rough weight 1.7kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	70	M4	60	14	50
TYPE 2	70	M5	60	14	50
TYPE 3	70	M5	60	14	50

■ 尺寸图 Dimensional Drawing

VRSF-15C·20C·25C-400

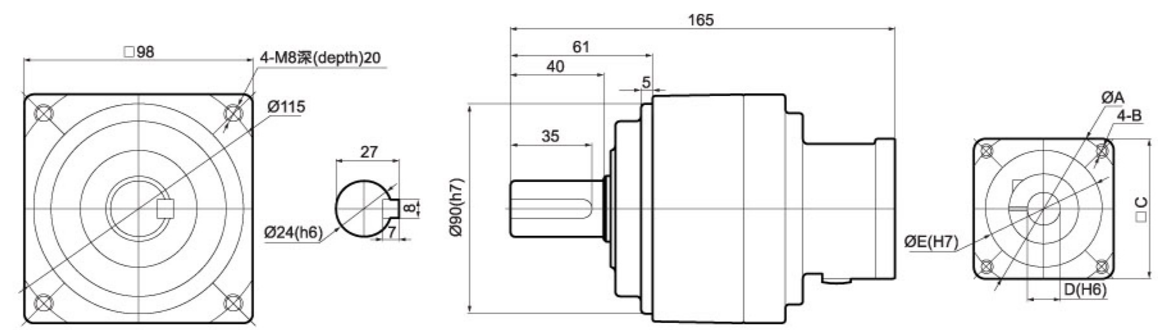


●概略重量2.1kg
●Rough weight 2.1kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	70	M4	60	14	50
TYPE 2	70	M5	60	14	50
TYPE 3	70	M5	60	14	50

VRSF-35D-400

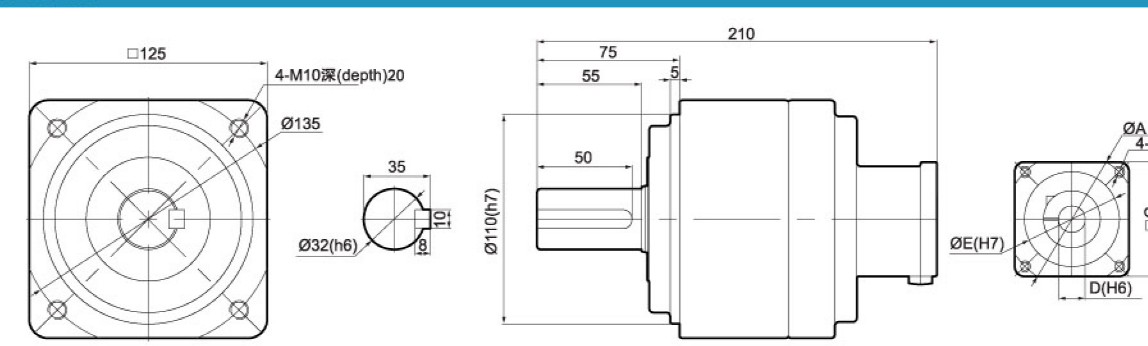


●概略重量3.2kg
●Rough weight 3.2kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	70	M4	60	14	50
TYPE 2	70	M5	60	14	50
TYPE 3	70	M5	60	14	50

VRSF-45E-400



●概略重量7.2kg
●Rough weight 7.2kg
●TYPE1～3的详细情况请参照P.44
●For details of TYPE1～3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	70	M4	60	14	50
TYPE 2	70	M5	60	14	50
TYPE 3	70	M5	60	14	50

■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

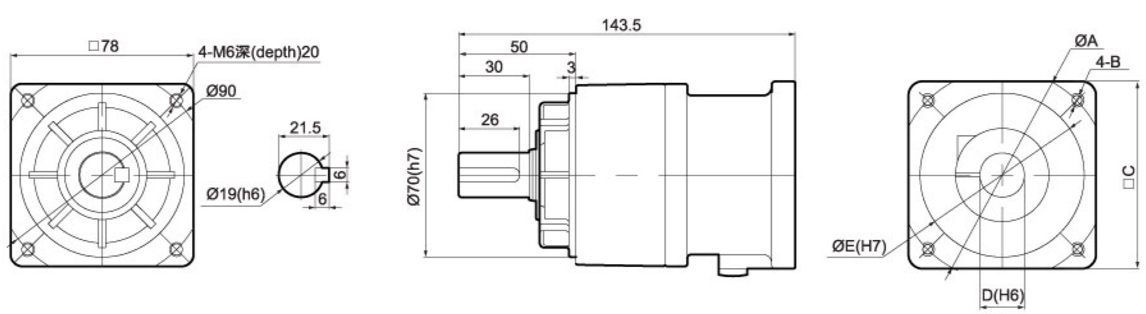
额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type 机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	输出轴转速 Output shaft speed (rpm)	额定输出扭矩 Standard output torque (N·m)	瞬间最大输出扭矩 Instantaneous max. output torque (N·m)	容许径向负荷 Permissible radial load (N)	容许轴向负荷 Permissible axial load (N)	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion (10^{-4}×kg·m²)	容许输出扭矩 Permissible output torque (N·m)	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque (N·m)
750W	1/3	VRSF	3	C	750	1000	6.37	19.3	784	392	0.913	6.86	20.6
	1/5	VRSF	5	C	750	600	10.7	32.1	980	490	0.713	11.5	34.3
	1/9	VRSF	9	D	750	333	18.2	54.7	1470	735	0.650	18.2	54.7
	1/15	VRSF	15	D	750	200	30.4	91.2	1760	882	0.700	30.4	91.2
	1/20	VRSF	20	D	750	150	40.6	122	1910	955	0.690	40.6	122
	1/25	VRSF	25	D	750	120	50.7	152	2060	1030	0.680	50.7	152
	1/35	VRSF	35	E	750	85	71.0	213	3430	1715	0.473	71.0	213
	1/45	VRSF	45	E	750	66	91.3	274	3520	1760	1.77	91.3	274

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。

Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3C-5C-750

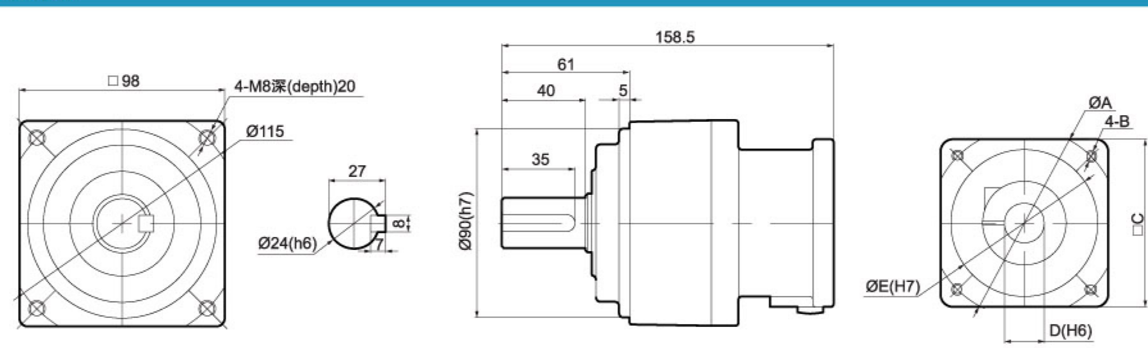


● 概略重量2.1kg
● Rough weight 2.1kg
● TYPE1~3的详细情况请参照P.44
● For details of TYPE1~3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	90	M5	80	19	70
TYPE 2	90	M6	80	16	70
TYPE 3	90	M6	80	19	70

VRSF-9D-750



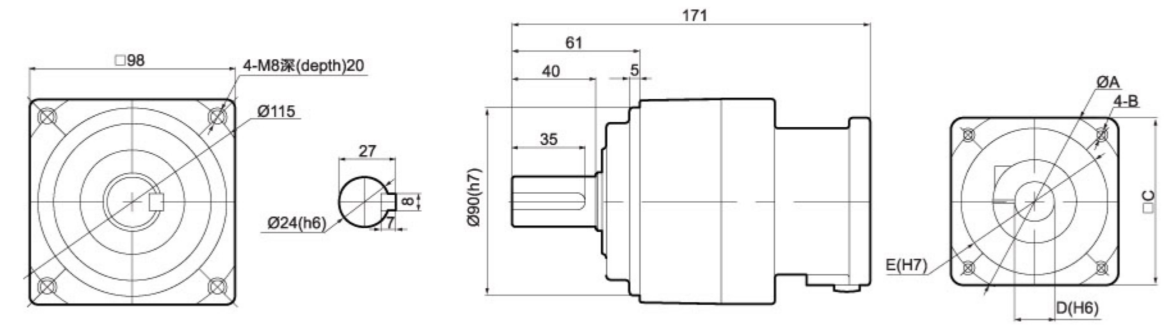
● 概略重量3.4kg
● Rough weight 3.4kg
● TYPE1~3的详细情况请参照P.44
● For details of TYPE1~3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	90	M5	80	19	70
TYPE 2	90	M6	80	16	70
TYPE 3	90	M6	80	19	70

■ 尺寸图 Dimensional Drawing

VRSF-15D·20D·25D-750

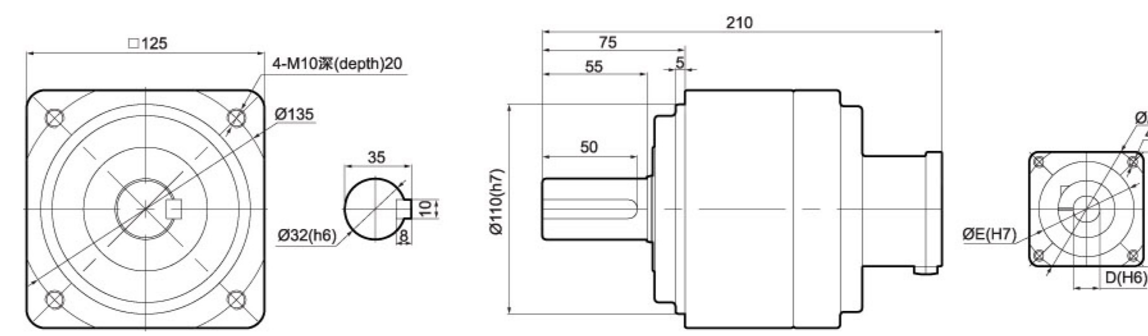


● 概略重量3.8kg
● Rough weight 3.8kg
● TYPE1~3的详细情况请参照P.44
● For details of TYPE1~3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	90	M5	80	19	70
TYPE 2	90	M6	80	16	70
TYPE 3	90	M6	80	19	70

VRSF-35E-750

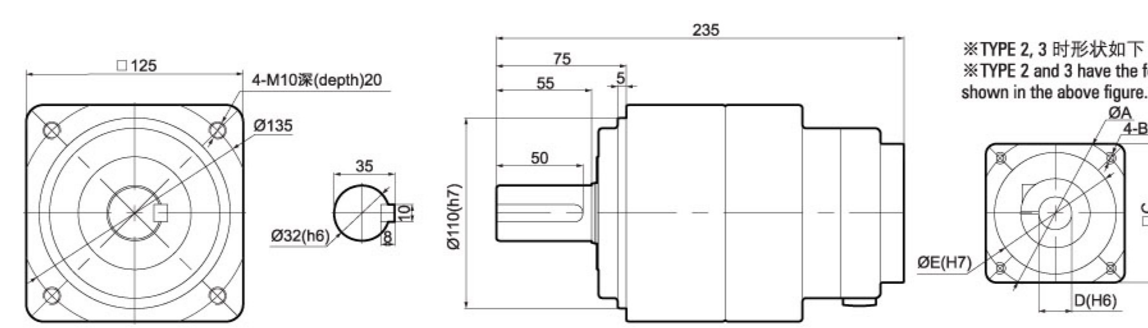


● 概略重量7.2kg
● Rough weight 7.2kg
● TYPE1~3的详细情况请参照P.44
● For details of TYPE1~3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	90	M5	80	19	70
TYPE 2	90	M6	80	16	70
TYPE 3	90	M6	80	19	70

VRSF-45E-750



※TYPE 2, 3 时形状如下
※TYPE 2 and 3 have the form as shown in the above figure.

● 概略重量12.0kg
● Rough weight 12.0kg
● TYPE1~3的详细情况请参照P.44
● For details of TYPE1~3, see 44 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	90	M5	80	19	70
TYPE 2	90	M6	80	16	70
TYPE 3	90	M6	80	19	70

1000W 尺寸图与性能表
1000W DIMENSIONAL DRAWING & PERFORMANCE TABLE

■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

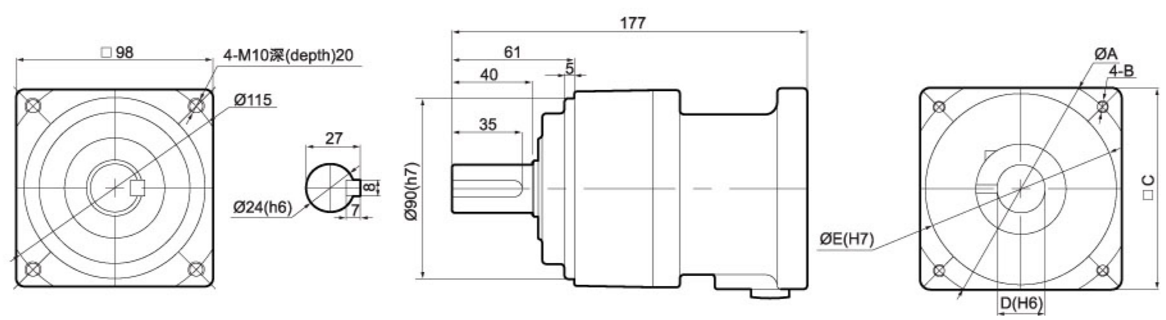
额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type				输出轴转速 Output shaft speed	额定输出扭矩 Standard output torque	瞬间最大输出扭矩 Instantaneous max. output torque	容许径向负荷 Permissible radial load	容许轴向负荷 Permissible axial load	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion	容许输出扭矩 Permissible output torque	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque
		机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	(rpm)	(N·m)	(N·m)	(N)	(N)	($10^{-4}\times kg\cdot m^2$)	(N·m)	(N·m)
1000W	1/3	VRSF	3	D	1000	1000	7.55	22.8	882	441	2.43	18.3	54.9
	1/5	VRSF	5	D	1000	600	13.4	40.5	1080	539	1.85	23.5	70.6
	1/9	VRSF	9	E	1000	333	20.2	60.1	1960	980	2.81	73.5	221
	1/15	VRSF	15	E	1000	200	33.3	100	2350	1180	1.95	91.4	274
	1/25	VRSF	25	E	1000	120	55.7	167	2650	1320	1.88	65.4	196

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。

Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3D·5D-1000



● 概略重量3.9kg
● Rough weight 3.9kg
● TYPE1～3的详细情况请参照P.45
● For details of TYPE1～3, see 45 page.

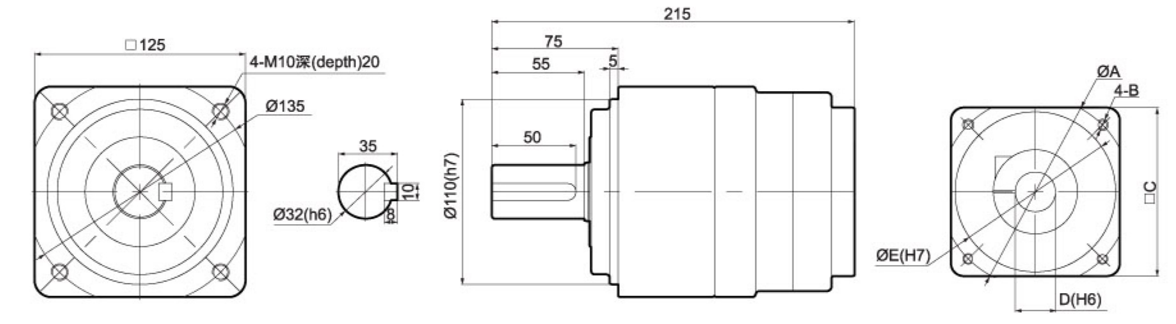
■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	100	M6	90	19	80
TYPE 2	115	M6	100	24	95
TYPE 3	115	M8	100	24	95

1000W 尺寸图与性能表
1000W DIMENSIONAL DRAWING & PERFORMANCE TABLE

■ 尺寸图 Dimensional Drawing

VRSF-9E-1000



● 概略重量11.0kg
● Rough weight 11.0kg
● TYPE1～3的详细情况请参照P.45
● For details of TYPE1～3, see 45 page.

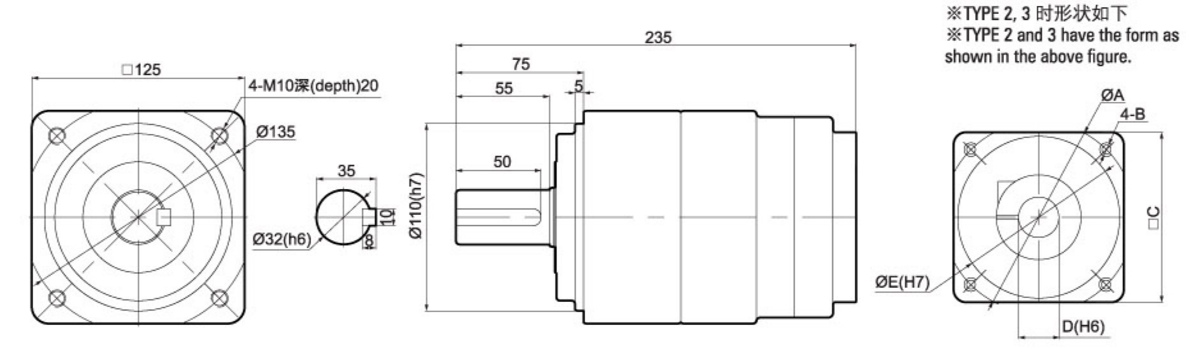
■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	100	M6	90	19	80
TYPE 2	115	M6	100	24	95
TYPE 3	115	M8	100	24	95

■ 尺寸图 Dimensional Drawing

VRSF-15E·25E-1000

※TYPE 2, 3 时形状如下
※TYPE 2 and 3 have the form as shown in the above figure.



● 概略重量12.0kg
● Rough weight 12.0kg
● TYPE1～3的详细情况请参照P.45
● For details of TYPE1～3, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	100	M6	90	19	80
TYPE 2	115	M6	100	24	95
TYPE 3	115	M8	100	24	95

■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

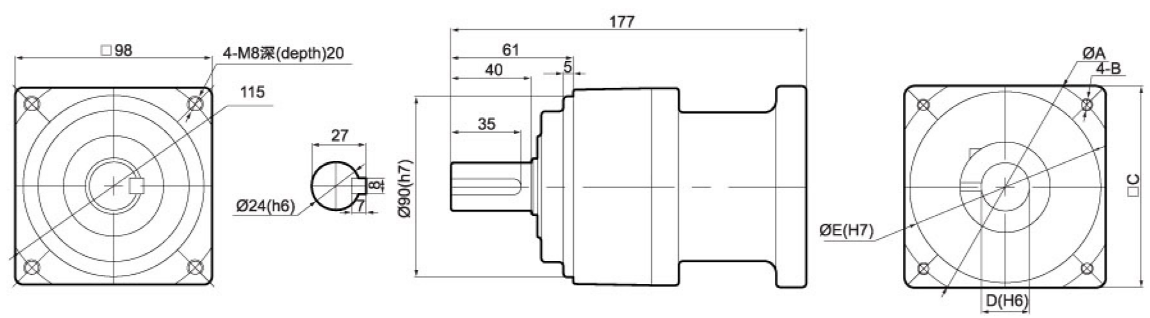
额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type				输出轴转速 Output shaft speed	额定输出扭矩 Standard output torque	瞬间最大输出扭矩 Instantaneous max. output torque	容许径向负荷 Permissible radial load	容许轴向负荷 Permissible axial load	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion	容许输出扭矩 Permissible output torque	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque
		机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	(rpm)	(N·m)	(N·m)	(N)	(N)	(10^{-4}×kg·m^2)	(N·m)	(N·m)
1500W	1/3	VRSF	3	D	1500	1000	12.3	37.1	882	441	2.43	18.3	54.9
	1/5	VRSF	5	D	1500	600	21.5	64.4	1080	539	1.85	23.5	70.6
	1/9	VRSF	9	E	1500	333	34.3	103	1960	980	2.81	73.5	221
	1/15	VRSF	15	E	1500	200	57.2	172	2350	1180	2.80	91.4	274

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。

Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3D·5D-1500

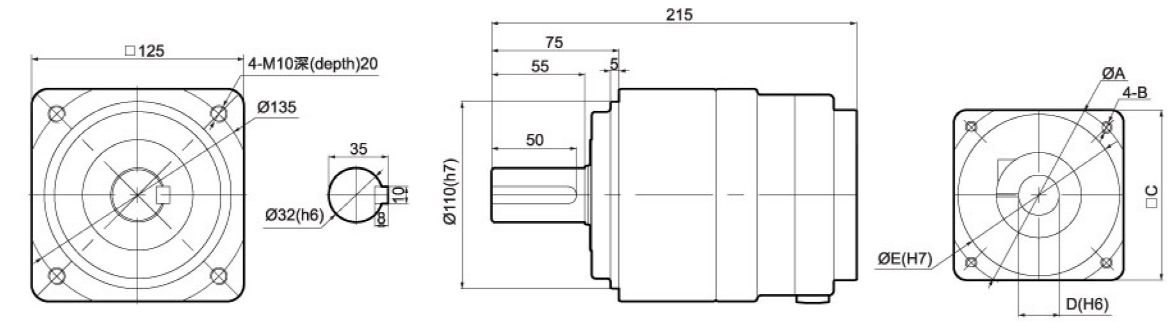


- 概略重量3.9kg
- Rough weight 3.9kg
- TYPE1～3的详细情况请参照P.45
- For details of TYPE1～3, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm）

马达种类Motor type	A	B	C	D	E
TYPE 1	115	M8	100	19	95
TYPE 2	115	M6	100	24	95
TYPE 3	115	M8	100	24	95

VRSF-9E-1500



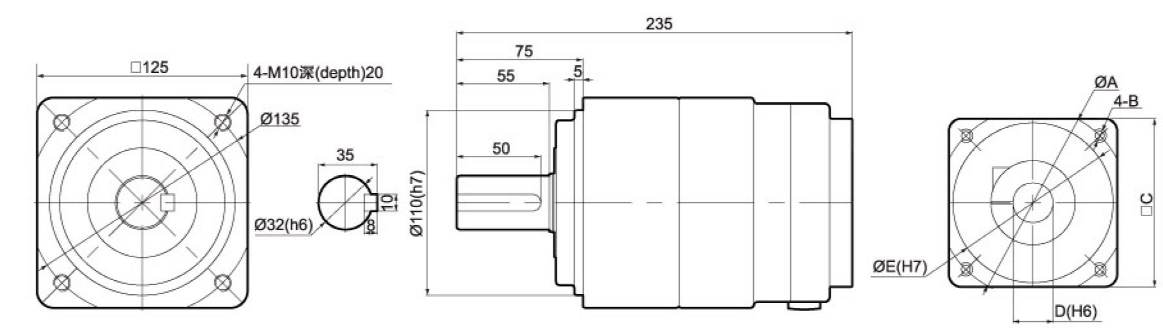
- 概略重量11.5kg
- Rough weight 11.5kg
- TYPE1～3的详细情况请参照P.45
- For details of TYPE1～3, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm）

马达种类Motor type	A	B	C	D	E
TYPE 1	115	M8	100	19	95
TYPE 2	115	M6	100	24	95
TYPE 3	115	M8	100	24	95

■ 尺寸图 Dimensional Drawing

VRSF-15E-1500



- 概略重量12.5kg
- Rough weight 12.5kg
- TYPE1～3的详细情况请参照P.45
- For details of TYPE1～3, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm）

马达种类Motor type	A	B	C	D	E
TYPE 1	115	M8	100	19	95
TYPE 2	115	M6	100	24	95
TYPE 3	115	M8	100	24	95

■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

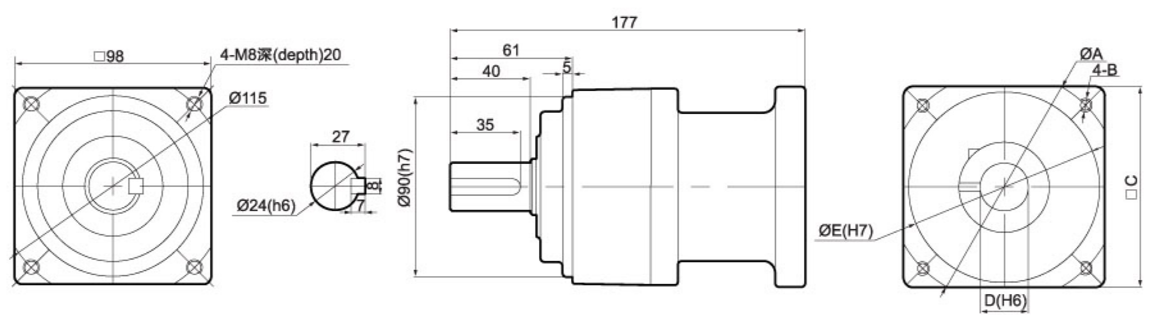
额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type				输出轴转速 Output shaft speed	额定输出扭矩 Standard output torque	瞬间最大输出扭矩 Instantaneous max. output torque	容许径向负荷 Permissible radial load	容许轴向负荷 Permissible axial load	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion	容许输出扭矩 Permissible output torque	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque
		机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	(rpm)	(N·m)	(N·m)	(N)	(N)	(10^{-4}×kg·m²)	(N·m)	(N·m)
2000W	1/3	VRSF	3	D	2000	1000	17.2	51.5	882	441	2.43	18.3	54.9
	1/5	VRSF	5	E	2000	600	23.8	71.5	1670	833	3.50	56.8	171
	1/9	VRSF	9	E	2000	333	48.6	146	1960	980	2.81	73.5	221
	1/15	VRSF	15	E	2000	200	81.0	243	2350	1180	2.80	91.4	274

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。

Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3D-2000

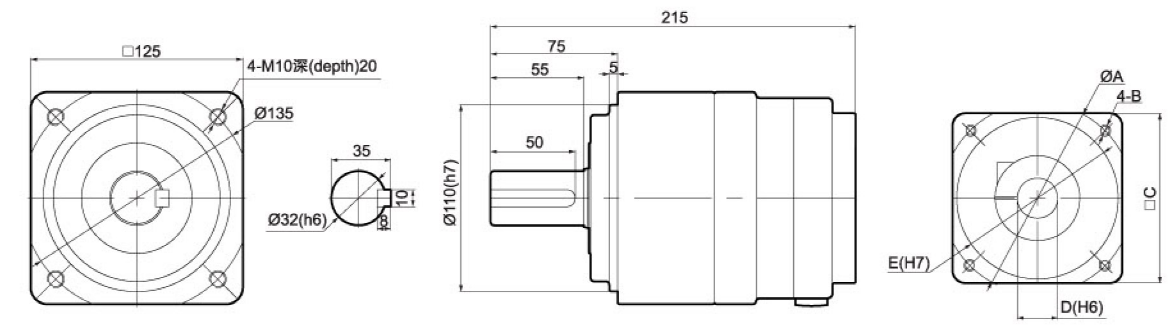


● 概略重量3.9kg
● Rough weight 3.9kg
● TYPE1～3的详细情况请参照P.45
● For details of TYPE1～3, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	115	M8	100	19	95
TYPE 2	115	M6	100	24	95
TYPE 3	115	M8	100	24	95

VRSF-5E-9E-2000



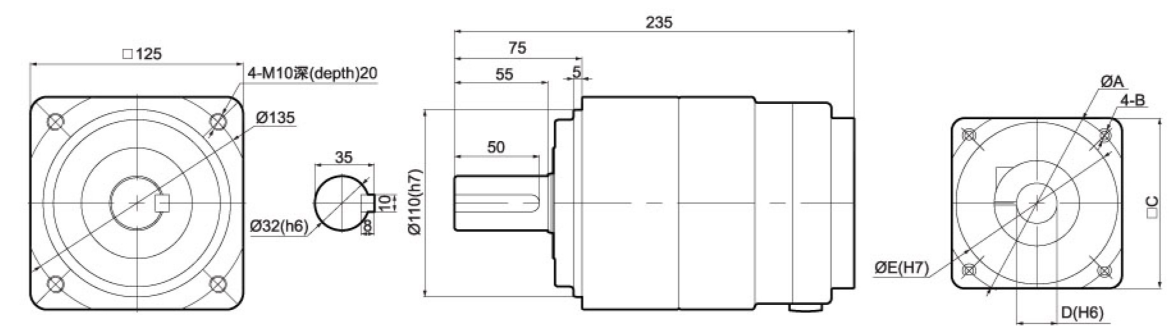
● 概略重量11.5kg
● Rough weight 11.5kg
● TYPE1～3的详细情况请参照P.45
● For details of TYPE1～3, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	115	M8	100	19	95
TYPE 2	115	M6	100	24	95
TYPE 3	115	M8	100	24	95

■ 尺寸图 Dimensional Drawing

VRSF-15E-2000



● 概略重量12.5kg
● Rough weight 12.5kg
● TYPE1～3的详细情况请参照P.45
● For details of TYPE1～3, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	115	M8	100	19	95
TYPE 2	115	M6	100	24	95
TYPE 3	115	M8	100	24	95

2500W 尺寸图与性能表
2500W DIMENSIONAL DRAWING & PERFORMANCE TABLE

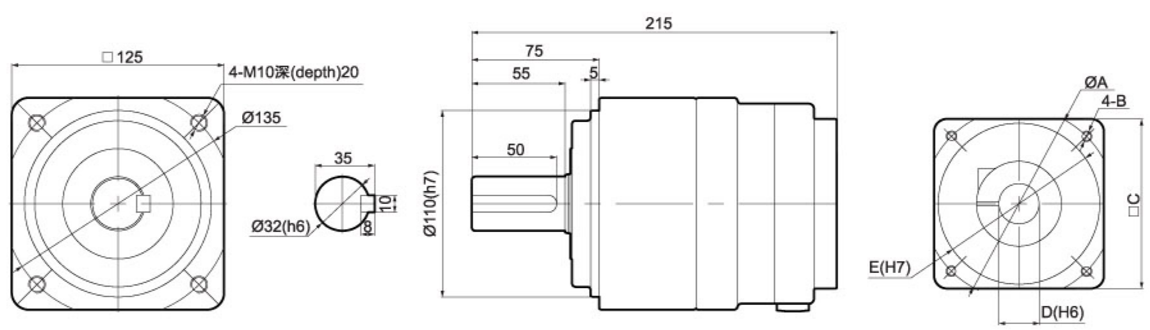
■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type 机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	输出轴转速 Output shaft speed (rpm)	额定输出扭矩 Standard output torque (N·m)	瞬间最大输出扭矩 Instantaneous max. output torque (N·m)	容许径向负荷 Permissible radial load (N)	容许轴向负荷 Permissible axial load (N)	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion (10^{-4}×kg·m²)	容许输出扭矩 Permissible output torque (N·m)	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque (N·m)
2500W	1/3	VRSF	3	E	2500	1000	19.0	57.2	1370	686	5.55	44.1	132
	1/5	VRSF	5	E	2500	600	31.8	95.5	1670	833	3.50	56.8	171
	1/9	VRSF	9	E	2500	333	60.8	182	1960	980	2.81	73.5	221

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。
Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3E·5E·9E-2500



●概略重量11.5kg
●Rough weight 11.5kg
●TYPE1～2的详细情况请参照P.45
●For details of TYPE1～2, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	115	M8	100	19	95
TYPE 2	115	M6	100	24	95
TYPE 3	-	-	-	-	-

3000W 尺寸图与性能表
3000W DIMENSIONAL DRAWING & PERFORMANCE TABLE

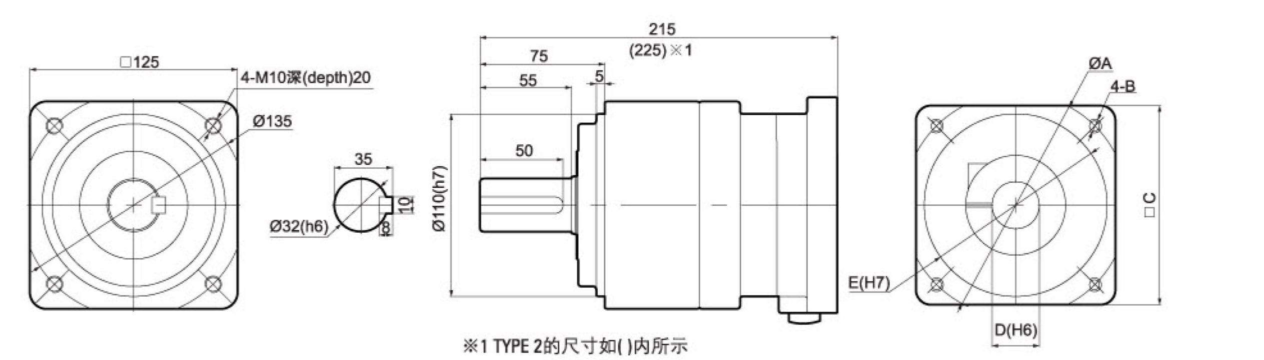
■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type 机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	输出轴转速 Output shaft speed (rpm)	额定输出扭矩 Standard output torque (N·m)	瞬间最大输出扭矩 Instantaneous max. output torque (N·m)	容许径向负荷 Permissible radial load (N)	容许轴向负荷 Permissible axial load (N)	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion (10^{-4}×kg·m²)	容许输出扭矩 Permissible output torque (N·m)	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque (N·m)
3000W	1/3	VRSF	3	E	3000	1000	23.7	71.2	1370	686	5.50	44.1	132
	1/5	VRSF	5	E	3000	600	39.6	119	1670	833	3.48	56.8	171
	1/9	VRSF	9	E	3000	333	73.0	219	1960	980	2.77	73.5	221

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。
Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3E·5E·9E-3000



※1 TYPE 2的尺寸如( )内所示
※1 TYPE2 has the numericalvalue indicated in ( ).

●概略重量12.0kg
●Rough weight 12.0kg
●TYPE1～2的详细情况请参照P.45
●For details of TYPE1～2, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	130	M8	120	22	110
TYPE 2	145	M8	130	28	110
TYPE 3	-	-	-	-	-

3500W 尺寸图与性能表
3500W DIMENSIONAL DRAWING & PERFORMANCE TABLE

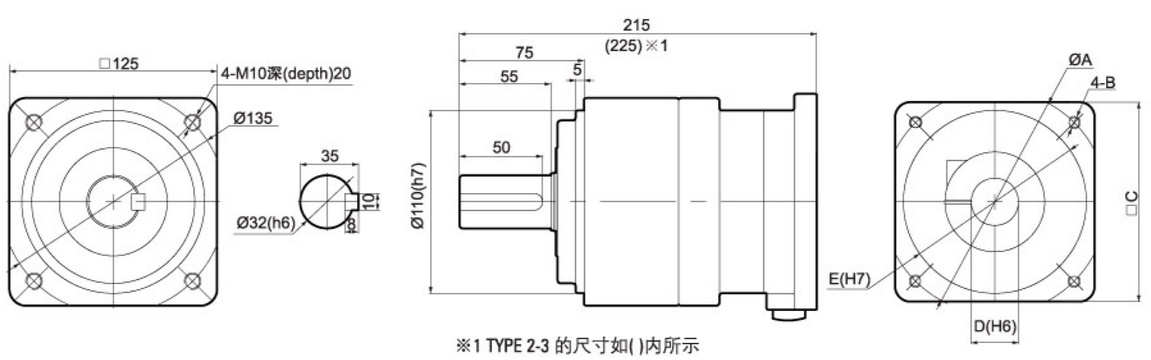
■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type				输出轴转速 Output shaft speed	额定输出扭矩 Standard output torque	瞬间最大输出扭矩 Instantaneous max. output torque	容许径向负荷 Permissible radial load	容许轴向负荷 Permissible axial load	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion	容许输出扭矩 Permissible output torque	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque
		机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	(rpm)	(N·m)	(N·m)	(N)	(N)	(10^{-4}×kg·m^2)	(N·m)	(N·m)
3500W	1/3	VRSF	3	E	3500	1000	28.3	85.2	1370	686	5.50	44.1	132
	1/5	VRSF	5	E	3500	600	47.2	141	1670	833	3.48	56.8	171

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。
Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3E-5E-3500



※1 TYPE 2-3 的尺寸如( )内所示
※1 TYPE 2-3 has the numericalvalue indicated in ( ).

●概略重量12.0kg
●Rough weight 12.0kg
●TYPE1～3的详细情况请参照P.45
●For details of TYPE1～3, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm）

马达种类Motor type	A	B	C	D	E
TYPE 1	130	M8	120	22	110
TYPE 2	-	-	-	-	-
TYPE 3	145	M8	130	28	110

4000W 尺寸图与性能表
4000W DIMENSIONAL DRAWING & PERFORMANCE TABLE

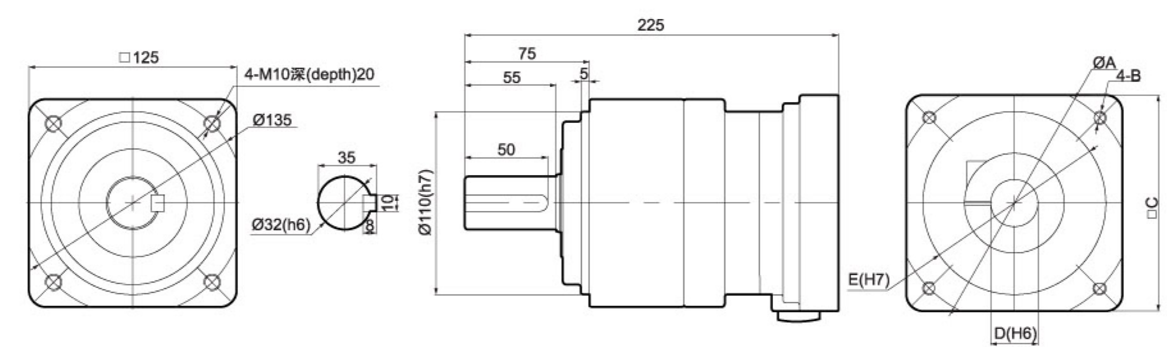
■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type				输出轴转速 Output shaft speed	额定输出扭矩 Standard output torque	瞬间最大输出扭矩 Instantaneous max. output torque	容许径向负荷 Permissible radial load	容许轴向负荷 Permissible axial load	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion	容许输出扭矩 Permissible output torque	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque
		机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	(rpm)	(N·m)	(N·m)	(N)	(N)	(10^{-4}×kg·m^2)	(N·m)	(N·m)
4000W	1/3	VRSF	3	E	4000	1000	33.1	99.0	1370	686	5.78	44.1	132
	1/5	VRSF	5	E	4000	600	55.3	166	1670	833	3.75	56.8	171

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。
Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3E-5E-4000



●概略重量13.0kg
●Rough weight 13.0kg
●TYPE1～2的详细情况请参照P.45
●For details of TYPE1～2, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm）

马达种类Motor type	A	B	C	D	E
TYPE 1	145	M8	130	24	110
TYPE 2	145	M8	130	28	110
TYPE 3	-	-	-	-	-

4500W 尺寸图与性能表
4500W DIMENSIONAL DRAWING & PERFORMANCE TABLE

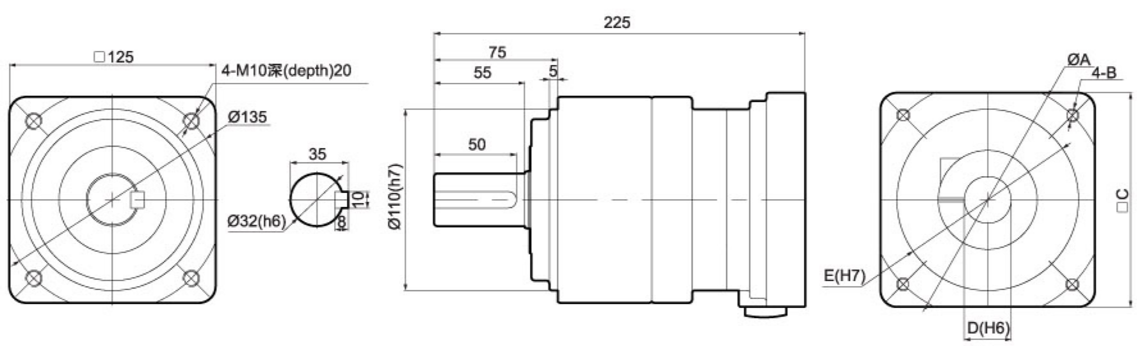
■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type				输出轴转速 Output shaft speed	额定输出扭矩 Standard output torque	瞬间最大输出扭矩 Instantaneous max. output torque	容许径向负荷 Permissible radial load	容许轴向负荷 Permissible axial load	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion	容许输出扭矩 Permissible output torque	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque
		机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	(rpm)	(N·m)	(N·m)	(N)	(N)	(10^{-4}×kg·m²)	(N·m)	(N·m)
4500W	1/3	VRSF	3	E	4500	1000	37.7	113	1370	686	5.78	44.1	132

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。
Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3E-4500



● 概略重量13.0kg
● Rough weight 13.0kg
● TYPE1～3的详细情况请参照P.45
● For details of TYPE1～3, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	145	M8	130	24	110
TYPE 2	-	-	-	-	-
TYPE 3	-	-	-	-	-

5000W 尺寸图与性能表
5000W DIMENSIONAL DRAWING & PERFORMANCE TABLE

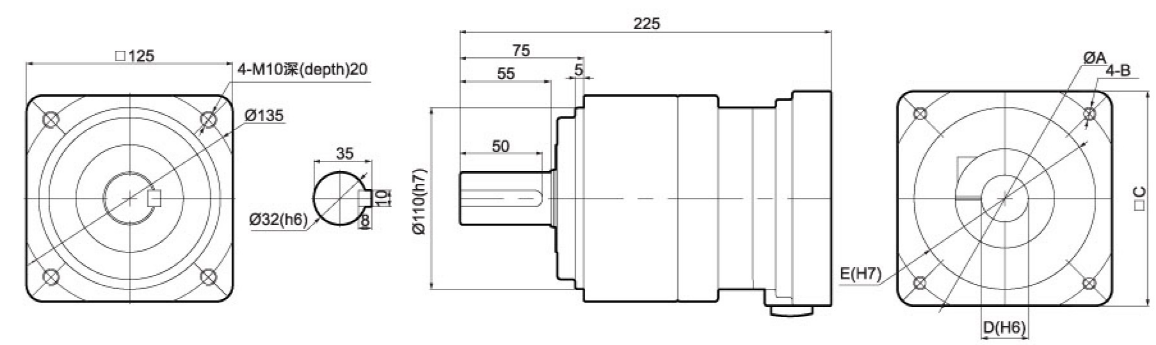
■ 性能表 Performance Table (输入转速为3,000rpm时 When input speed is 3000rpm)

额定输入马达功率 Rated input motor	减速比 Reduction ratio	型号 Type				输出轴转速 Output shaft speed	额定输出扭矩 Standard output torque	瞬间最大输出扭矩 Instantaneous max. output torque	容许径向负荷 Permissible radial load	容许轴向负荷 Permissible axial load	输入轴换算内部惯性力矩 Internal moment of inertia of input shaft conversion	容许输出扭矩 Permissible output torque	瞬间最大容许输出扭矩 Instantaneous max. permissible output torque
		机种 Model	减速比 Reduction ratio	段位号 Type no.	马达功率 Motor	(rpm)	(N·m)	(N·m)	(N)	(N)	(10^{-4}×kg·m²)	(N·m)	(N·m)
5000W	1/3	VRSF	3	E	5000	1000	42.9	128	1370	686	5.78	44.1	132

注1) 安装基准机种（马达适用表记载系列）以外的马达时，每次都要与我们联系。（法兰尺寸可能不同）
注2) 输入轴换算惯性力矩仅为减速机的数值，不包括马达的惯性力矩。
注3) 最高输入转速为5000rpm。正常情况下请转速控制在3000rpm以下。
注4) 容许径向负荷表示输出轴中央部位的值。
注5) 全部为斜齿轮适用范围。
注6) 马达的安装顺序请参照P.46
注7) 输出轴旋转方向与马达输入旋转方向相同。
Note 1) In case of attachment to a motor beyond the standard models(motor matching series), contact us.(How to measure dimensions of the flange may be changed in some cases.)
Note 2) The moment of inertia of input shaft conversion is only gained from the reducer, so it does not include moment of inertia of the motor.
Note 3) The max. input speed is 5000rpm, and usually set to 3000rpm or less.
Note 4) The permissible radial load is indicated on the center of the output shaft.
Note 5) All values are within the range corresponding to helical gear.
Note 6) For motor assembly procedure, see 46 page.
Note 7) Rotation of the output shaft is in the same direction as motor.

■ 尺寸图 Dimensional Drawing

VRSF-3E-5000



● 概略重量13.0kg
● Rough weight 13.0kg
● TYPE1～3的详细情况请参照P.45
● For details of TYPE1～3, see 45 page.

■法兰部位详细尺寸表Detailed flange dimensions table（单位Unit: mm)

马达种类Motor type	A	B	C	D	E
TYPE 1	145	M8	130	24	110
TYPE 2	145	M8	130	28	110
TYPE 3	145	M8	130	28	110

马达对应表(输入转速为3,000RPM时)
MOTOR MATCHING TABLE (WHEN INPUT SPEED IS 3000RPM)

■对应表 MATCHING TABLE

<table>
<tr><th rowspan="2">生产厂家
Motor manufacturer</th><th rowspan="2">马达系列
Motor series</th><th colspan="5">马达功率 Motor power (W)</th></tr>
<tr><th>50W</th><th>100W</th><th>200W</th><th>400W</th><th>750W</th></tr>
<tr><td rowspan="6">松下电器产业(株)
Panasonic</td><td>MSM</td><td colspan="5">TYPE 1</td></tr>
<tr><td>MSMA</td><td colspan="5">TYPE 1</td></tr>
<tr><td>MSMD</td><td colspan="5">TYPE 1</td></tr>
<tr><td>MUMA</td><td>基准外Out of standard</td><td>基准外Out of standard</td><td colspan="3">TYPE 1</td></tr>
<tr><td>MBMK</td><td>TYPE 1</td><td>基准外Out of standard</td><td colspan="3">TYPE 1</td></tr>
<tr><td>MUMS</td><td colspan="5">基准外Out of standard</td></tr>
<tr><td rowspan="6">(株)安川电机
Yaskawa Electric</td><td>SGM</td><td colspan="5">TYPE 2</td></tr>
<tr><td>SGMAH</td><td colspan="5">TYPE 2</td></tr>
<tr><td>SGMAS</td><td colspan="5">TYPE 2</td></tr>
<tr><td>SJME</td><td>无对象No subject</td><td colspan="4">TYPE 2</td></tr>
<tr><td>SGMJV</td><td colspan="5">TYPE 3</td></tr>
<tr><td>SGMAV</td><td colspan="5">TYPE 3</td></tr>
<tr><td rowspan="9">三菱电机(株)
Mitsubishi Wlectric</td><td>HC-KF</td><td colspan="5">TYPE 3</td></tr>
<tr><td>HC-KFS</td><td colspan="5">TYPE 3</td></tr>
<tr><td>HC-MF</td><td colspan="5">TYPE 3</td></tr>
<tr><td>HC-MFS</td><td colspan="5">TYPE 3</td></tr>
<tr><td>HA-ME</td><td colspan="5">TYPE 3</td></tr>
<tr><td>HC-PQ</td><td colspan="4">TYPE 3</td><td>无对象No subject</td></tr>
<tr><td>HC-KQ</td><td colspan="4">TYPE 3</td><td>无对象No subject</td></tr>
<tr><td>HF-KP</td><td colspan="5">TYPE 3</td></tr>
<tr><td>HF-MP</td><td colspan="5">TYPE 3</td></tr>
<tr><td rowspan="4">欧姆龙(株)
Omron</td><td>R88M-U</td><td colspan="5">TYPE 2</td></tr>
<tr><td>R88M-W</td><td colspan="5">TYPE 2</td></tr>
<tr><td>R7M-A</td><td colspan="5">TYPE 2</td></tr>
<tr><td>R7M-Z</td><td colspan="5">TYPE 2</td></tr>
<tr><td>富士电机机器控制(株)
Fuji Electric Systems</td><td>GYS※</td><td colspan="5">TYPE 2</td></tr>
<tr><td rowspan="2">山洋电气(株)
Sanyo denki</td><td>P30B</td><td colspan="4">TYPE 3</td><td>TYPE 2</td></tr>
<tr><td>Q1</td><td colspan="4">TYPE 3</td><td>基准外Out of standard</td></tr>
<tr><td>(株)基恩斯Keyence</td><td>MV</td><td colspan="4">TYPE 3</td><td>基准外Out of standard</td></tr>
<tr><td rowspan="3">东荣电机(株)
Toshiba Machine</td><td>VLBSV-Z※</td><td colspan="2">基准外Out of standard</td><td colspan="3">TYPE 3</td></tr>
<tr><td>VLBSV-ZA※</td><td colspan="2">基准外Out of standard</td><td colspan="3">TYPE 3</td></tr>
<tr><td>VLBST</td><td colspan="2">基准外Out of standard</td><td colspan="2">TYPE 3</td><td>基准外Out of standard</td></tr>
<tr><td rowspan="2">多摩川精机(株)
Tamagawa Seiki</td><td>TBL-i※</td><td colspan="4">TYPE 3</td><td>无对象No subject</td></tr>
<tr><td>TBL-i II ※</td><td colspan="4">TYPE 3</td><td>基准外Out of standard</td></tr>
<tr><td rowspan="3">日机电装(株)
Nikki denso</td><td>NA50</td><td colspan="5">TYPE 1</td></tr>
<tr><td>NA70※</td><td colspan="4">TYPE 3</td><td>无对象No subject</td></tr>
<tr><td>NA80※</td><td colspan="4">TYPE 3</td><td>基准外Out of standard</td></tr>
<tr><td rowspan="2">(株)三明Sanmei</td><td>TS※</td><td colspan="4">TYPE 3</td><td>基准外Out of standard</td></tr>
<tr><td>SS※</td><td colspan="4">TYPE 3</td><td>基准外Out of standard</td></tr>
<tr><td>(株)日立产机系统
Hitachi Industrial Equip-ment Systems</td><td>ADMA</td><td colspan="4">TYPE 3</td><td>基准外Out of standard</td></tr>
<tr><td>三木普利
Miki Pulley</td><td>SA3</td><td colspan="5">TYPE 1</td></tr>
</table>

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Note 3) Note that thrust power arsing out of instantaneous max. ouyput torque bu the combination of motor capactith (motor of the motor series table) aand reduction ratio may exceed permissible thrust power of the servo motor. See the thrust load table on 49 page.).
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Our gearbox can match to servo motor of followings manufacturers, including aboves. Please ask us about the assembly.

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马达对应表(输入转速为3,000RPM时)
MOTOR MATCHING TABLE (WHEN INPUT SPEED IS 3000RPM)

■对应表 MATCHING TABLE

<table>
<tr><th rowspan="2">生产厂家
Motor manufacturer</th><th rowspan="2">马达系列
Motor series</th><th colspan="9">马达功率 Motor power(W)</th></tr>
<tr><th>1000W</th><th>1500W</th><th>2000W</th><th>2500W</th><th>3000W</th><th>3500W</th><th>4000W</th><th>4500W</th><th>5000W</th></tr>
<tr><td rowspan="2">松下电器产业(株)
Panasonic</td><td>MSM</td><td colspan="9">TYPE 1</td></tr>
<tr><td>MSMA</td><td colspan="9">TYPE 1</td></tr>
<tr><td rowspan="3">(株)安川电机
Yaskawa Electric</td><td>SGMS</td><td colspan="3">TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td></tr>
<tr><td>SGMSH</td><td colspan="3">TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td></tr>
<tr><td>SGMSS</td><td colspan="5">TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td></tr>
<tr><td rowspan="3">三菱电机(株)
Mitsubishi Wlectric</td><td>HC-RF</td><td colspan="3">TYPE 3</td><td colspan="2">无对象No subject</td><td>TYPE 3</td><td colspan="2">无对象No subject</td><td>TYPE 3</td></tr>
<tr><td>HC-RFS</td><td colspan="3">TYPE 3</td><td colspan="2">无对象No subject</td><td>TYPE 3</td><td colspan="2">无对象No subject</td><td>TYPE 3</td></tr>
<tr><td>HC-RP</td><td colspan="3">TYPE3</td><td colspan="2">无对象No subject</td><td>TYPE 3</td><td colspan="2">无对象No subject</td><td>TYPE3</td></tr>
<tr><td rowspan="2">欧姆龙(株)
Omron</td><td>R88M-U</td><td colspan="3">TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td></tr>
<tr><td>R88M-W</td><td colspan="3">TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td></tr>
<tr><td>富士电机机器控制(株)
Fuji Electric Systems</td><td>GYS</td><td colspan="3">TYPE 3</td><td>无对象No subject</td><td>TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td><td>无对象No subject</td><td>TYPE 2</td></tr>
</table>

■下列系列马达也可以标准方式适应 Standard compatibility with the follwing motor series

<table>
<tr><th>生产厂家
Motor manufacture</th><th>马达系列
Motor series</th><th>马达功率 Motor power(W)</th></tr>
<tr><td rowspan="2">三菱电机(株)
Mitsubishi Wlectric</td><td>HC-SFS※</td><td rowspan="2">500W, 1000W, 1500W, 2000W, 3500W</td></tr>
<tr><td>HF-SP</td></tr>
<tr><td rowspan="3">(株)安川电机
Yaskawa Electric</td><td>SGMP</td><td rowspan="3">100W, 200W, 400W, 750W, 1500W</td></tr>
<tr><td>SGMPH</td></tr>
<tr><td>SGMPS</td></tr>
<tr><td>松下电器产业(株)
Panasonic</td><td>MQMA</td><td>100W, 200W, 400W</td></tr>
<tr><td rowspan="2">欧姆龙(株)
Omron</td><td>R88M-WP</td><td>100W, 200W, 400W, 750W, 1500W</td></tr>
<tr><td>R7M-AP</td><td>100W, 200W, 400W, 750W</td></tr>
<tr><td>富士电机机器控制(株)
Fuji Electric Systems</td><td>GYC</td><td>100W, 200W, 400W</td></tr>
<tr><td>发那科(株)
Fanuc</td><td>ßiS※</td><td>200W, 400W, 500W, 750W, 1200W</td></tr>
</table>

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安装
ASSEMBLY

■ 安装马达的步骤 Assembly procedure

客户自行安装伺服马达时，请按以下要领进行安装。伺服马达的尺寸多种多样，除指定的产品外，有些马达可能会无法连接法兰，因为，一定要使用您订货时指定的马达。

If a customer personally assembles the servo motor and reducer please use the following tip. The reducer flange to which the servo motor is attached has different dimensions based on the motor specified. Therefore, assembly may be impossible for some motor. Make sure the correct motor is specified before ordering the reducer.

1、安装无键马达 VRSF规格 VRSF spec. in case of assembling a motor without key

① 取下橡胶帽，转动输入轴，使螺栓头和橡胶帽的孔吻合。并请确认固定螺栓已松开。
② 将马达轴平稳地插入输出轴（请确保不受阻塞地顺畅的插入）。请充分注意不要让马达倾斜插入。
③将马达固定在减速机上，并按指定的扭矩将螺栓拧紧。参考表1
④ 使用扭矩扳手等工具，按指定的扭矩将输入轴的固定螺栓拧紧。参考表2
⑤ 盖上橡胶帽。安装到此结束。
① Take off the rubber cap, turn the input shaft, and match the head of the bolt to the hole of the rubber cap. Make sure that the set bolt is loosened.
② Gradually put the motor shaft into the input shaft (Ensure that it is smoothly put in without jam.) Be careful not to be inserted with the motor tilted.
③ Attach the motor to the reducer and fasten the bolt with designated fastening torque. See Table 1.
④ Fasten the set bolt of the input shaft with designated fastening torque using torque wrench, etc. See Table 2.
⑤ Puton a rubber cap. It is the end of assembling.

表1 Table1

马达固定螺栓Motor combination bolt	拧紧扭矩Fastening torque	
	N·m	kgf·cm
M3	1.0	10
M4	3.0	30
M5	5.8	60
M6	9.8	100
M8	19.6	200
M10	39.2	400
M12	68.6	700
M16	168	1650

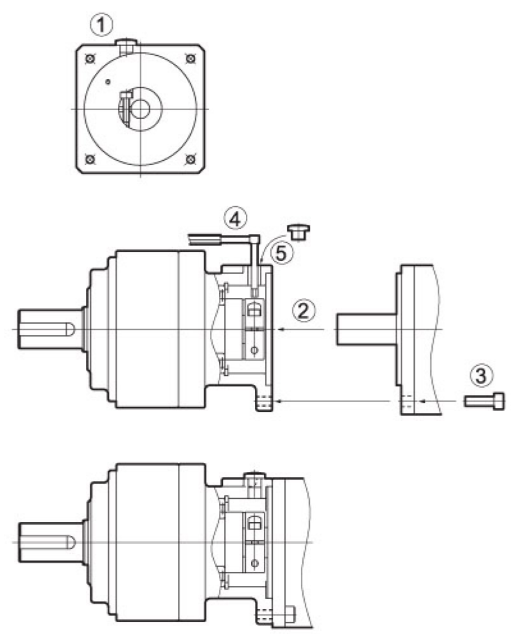


表2 Table2

固定螺栓 Combination bolt	拧紧扭矩Fastening torque	
	N·m	kgf·cm
M3	1.5	15
M4	3.5	35
M5	7.1	71
M6	12	120
M8	30	300

带键槽式马达的键取下后，可以像上述无键马达一样安装。无需担心会滑动。
You can assemble the motor with keyway like above when take off the key. There is no risk of dislocation.

安装
ASSEMBLY

2、安装带键槽马达 VRKF规格 VRKF spec. in case of assembling a motor with key

① 取下橡胶帽，转动输入轴，使螺栓头和橡胶帽的孔吻合。
② 在马达轴上涂上防烧结剂（二氧化钼等），并将键与键槽对上后平稳地插入输出轴（请确保不受阻塞地顺畅的插入）。请务必注意不要让马达倾斜插入。
③ 将马达安装在减速机上，并按指定的扭矩将螺栓拧紧。参考表1
④ 使用扭矩扳手等工具按指定的扭矩将输入轴的固定螺栓拧紧，并确认键已被压紧。参考表3
⑤ 盖上橡胶帽。安装到此结束。
①Take off the rubber cap, turn the input shaft, and match the head of the bolt to the hole of the rubber cap.
②Coat carbon formation inhibitors(molybdenum dioxide etc.) onto the motor shaft, match the key to the key slot, and gradually
③Combine the motor with the reducer and fasten with the designated fastening bolt. See Table 1.
④For set bolt of the input shaft, fasten using torque wrench with the designated fastening torque with the key firmly pressed. See Table 3.
⑤Puton a rubber cap. The is the end.

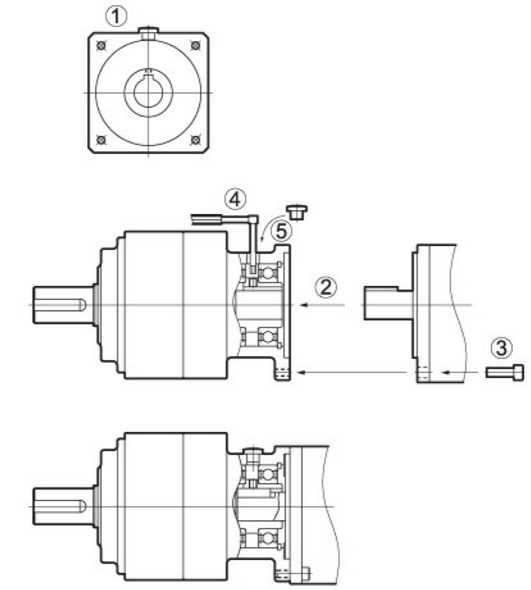


表3 Table3

固定螺栓 Combination bolt	拧紧扭矩Fastening torque	
	N·m	kgf·cm
M4	2.0	20
M5	4.3	43
M6	7.3	73
M8	16.8	168

■ 减速机的安装 Reducer assembly

将减速机安装在设备上时，请在确认安装面平坦且无毛刺等后，使用扭矩扳手等工具按指定的扭矩用螺栓将其固定。参考表4

Jointing with reducerIn case of jointing a reducer with the device, make sure that the combining side is plane without inconsistency, and when assemble reducer outo equipment, ensuring assembly surface smooth and without burr. See Table 4.

表4 Table4

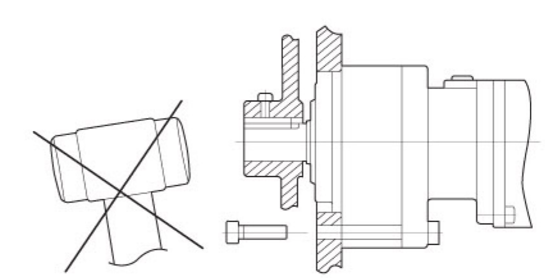
减速机固定螺栓Reducercombination bolt		拧紧扭矩Fastening torque	
		N·m	kgf·cm
B段Type	M5	5.8	60
C段Type	M6	9.8	100
D段Type	M8	19.6	200
E段Type	M10	39.2	400

■ 连接输出轴 Connection to the output shaft

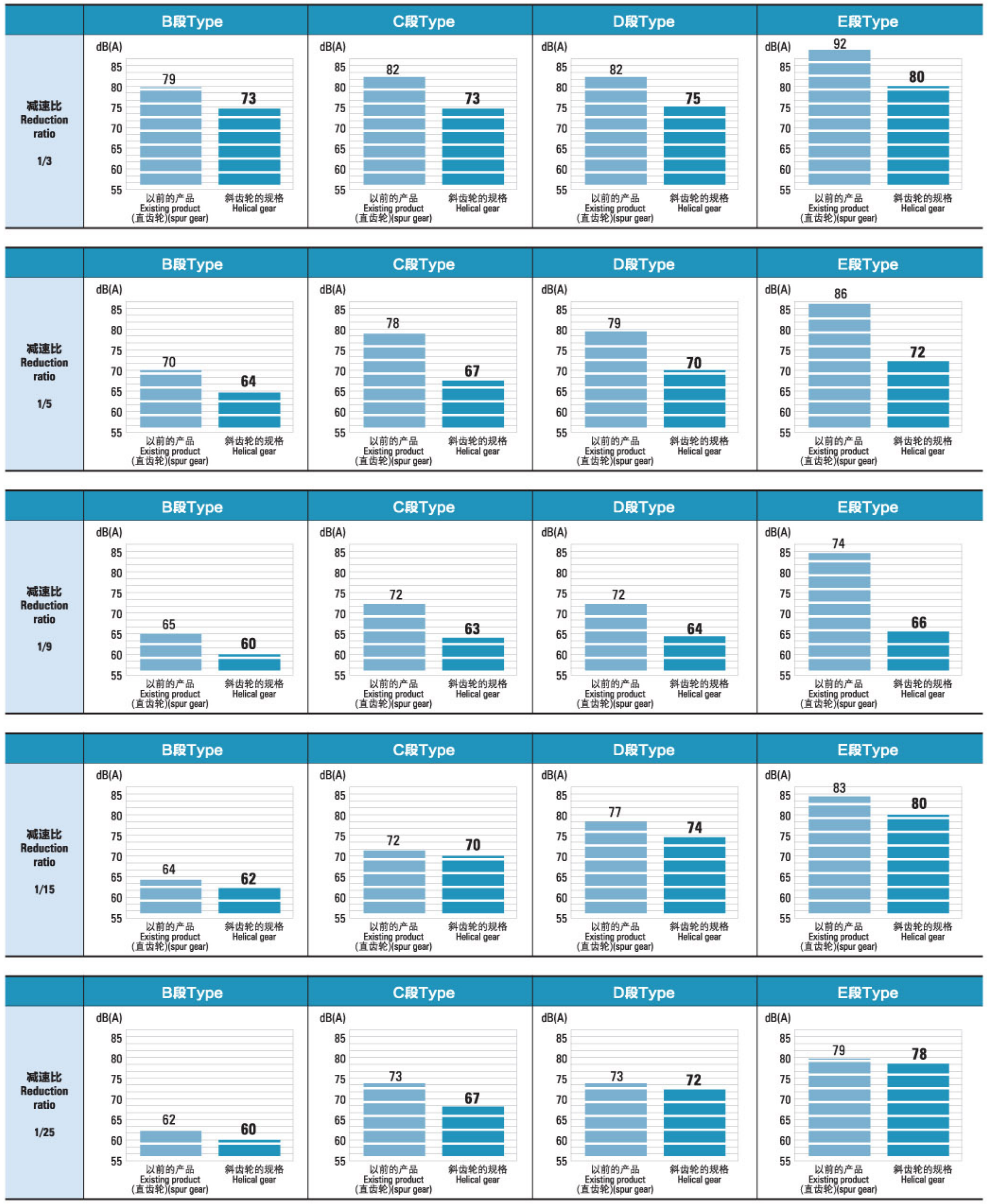
注意事项：
1、在输出轴上安装耦合器、滑轮等时，请勿在输出轴上施加过大的轴向负荷。
2、请勿使用强力将轴敲入，以免使轴承或减速机内部受到损伤。
3、安装的耦合器等的轴和键槽如有较大松动，可能会导致设备烧毁，安装时请充分注意。
4、安装耦合器等时，请使用固定螺栓来将键固定住。
5、连接时请充分调校轴心。

Cauti ons

1. When assemble a coupling, pulley, etc. onto the output shaft, make sure that excessive axial load not be given to the output shaft.
2. In case of strongly hitting the shaft with a hammer, the shaft inlet or the inside of the reducer may be damaged, therefore it shall be prohibited.
3. If the shaft or key of a coupling assembled is loosed, it may cause carbonization, so be careful when assembling.
4. For assembling of a coupling, fix the key with a set bolt.
5. Please adjust shaft centre carefully in connecting.



噪音值比较
COMPARISON OF NOISE VALUES



公司内部调查中的测定条件如下：
※减速机输入转速：3000rpm
※测定位置：距离产品50cm的位置
※噪音值：噪音值是代表值
※负荷：减速机额定负荷
※减速机固定方法：减速机固定于L型安装板上后，再固定于平台上。

The measuring conditions in an internal survey are as mentioned below:
※Reducer input speed : 3000rpm
※Measurement spot : 50cm distant from the product
※Noise value : Typical values chosen for noise values
※Load : Reducer load rating
※Reducer fixation : The reducer is fixed onto the L-type attachment plate so that it cannot move.

轴向、容许径向负荷
TECHNICAL DATA THRUST LOAD

■轴向负荷(对马达的轴向负荷) Thrust load (to motor)

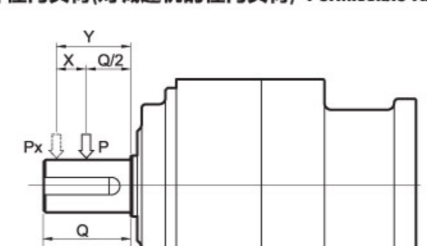
因采用的是斜齿轮，故在轴的方向上会产生轴向的力。但本公司的ABLE减速机采用可以缓和轴向力的结构，因此，不管是背隙标准型，还是LB型、PB型，不会对伺服马达造成影响。至于其他的马达系列，请对各马达生产厂家的容许轴向负荷进行确认。

Thrust force acts in a shaft direction for units equipped with a helical gear. However, our ABLE REDUCER is designed to mitigate thrust force and thus does not influence a servo motor irrespective of backlash standard type, LB type, and PB type. For other motor series, see permissible thrust of each motor manufacturer.

额定输入马达功率 Rated input motor	型号 Type				VR减速机产生的径向力 VR Reducer Thrust Force (N)	伺服马达瞬间容许径向负荷(N) Instantaneous Time Permissible Thrust Load Of Servo Motor (N)		
	机种 Model		段位号 Type no.	马达功率 Motor		松下电器产业(株) MSMA系列 Panasonic MSMA Series	(株)安川电机SGMAH系列 Yaskawa Electric SGMAH Series	三菱电机(株)HC-MF系列 Mitsubishi Wlectric HC-MF Series
50W	VRSF	3	B	50	7	58	54	59
	VRSF	5	B	50	15			
	VRSF	9	B	50	29			
	VRSF	15	B	50	15			
	VRSF	20	B	50	15			
	VRSF	25	B	50	15			
	VRSF	35	B	50	22			
	VRSF	45	C	50	29			
	VRSF	81	C	50	29			
100W	VRSF	3	B	100	15	58	54	59
	VRSF	5	B	100	29			
	VRSF	9	B	100	46			
	VRSF	15	B	100	29			
	VRSF	20	B	100	29			
	VRSF	25	B	100	29			
	VRSF	35	C	100	16			
	VRSF	45	C	100	46			
	VRSF	81	D	100	46			
200W	VRSF	3	B	200	22	98	74	98
	VRSF	5	B	200	44			
	VRSF	9	C	200	43			
	VRSF	15	C	200	21			
	VRSF	20	C	200	21			
	VRSF	25	C	200	21			
	VRSF	35	C	200	32			
	VRSF	45	D	200	43			
	VRSF	81	E	200	17			
400W	VRSF	3	B	400	44	98	74	98
	VRSF	5	C	400	43			
	VRSF	9	C	400	64			
	VRSF	15	C	400	43			
	VRSF	20	C	400	43			
	VRSF	25	C	400	43			
	VRSF	35	D	400	26			
	VRSF	45	E	400	34			
750W	VRSF	3	C	750	20	147	147	147
	VRSF	5	C	750	40			
	VRSF	9	D	750	64			
	VRSF	15	D	750	32			
	VRSF	20	D	750	32			
	VRSF	25	D	750	32			
	VRSF	35	E	750	48			

注 1)产生的径向力：产生瞬间最大输出扭矩时的数值。 Note 1) Thrust force : Numerical value upon max. instantaneous output torque

■容许径向负荷(对减速机的径向负荷) Permissible radial load (to reducer)



径向负荷处于输出轴中央部位以外的位置时，请用下列公式和常数计算。
If radial load is out of the center of the output shaft,calculate using the following equations and positive numbers:

$Px=\{K/(K+X)\}\times P$

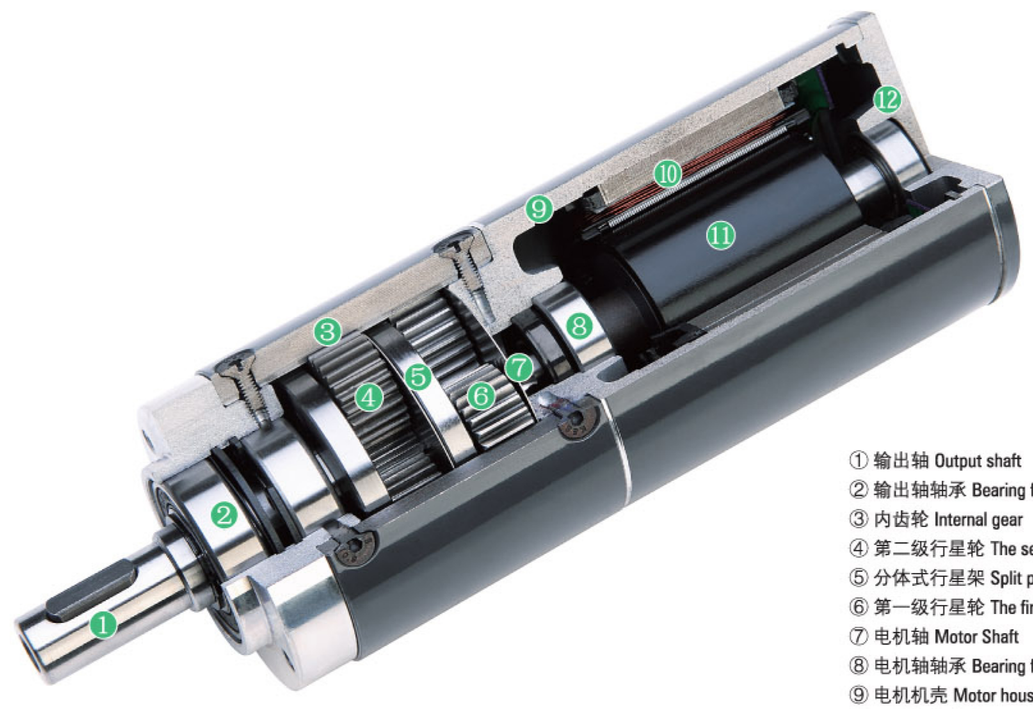
$X=Y-Q/2$

P: 容许径向负荷(N) Permissible radial load (N)
Q: 常数Positive number
K: 常数Positive number
X: 负荷点位移距离(mm) Load point displacement distance (mm)
Y: 负荷点(mm) Load point (mm)
Px: 容许轴负荷(N) Permissible shaft load (N)

段位号 Type no.	常数: Q Positive number: Q	常数: K Positive number: K
B	20	46
C	30	70
D	40	79.5
E	55	104

PM系列行星齿轮减速电动机型号的阅读方法
PRODUCT NUMBER CODE-PLANETARY GEAR MOTOR

剖视图 SECTIONAL DRAWING



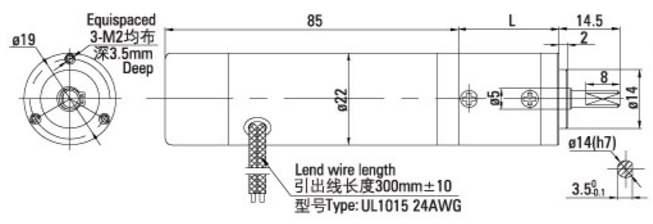
① 输出轴 Output shaft
② 输出轴轴承 Bearing for the output shaft
③ 内齿轮 Internal gear
④ 第二级行星轮 The second stage of planetary gear
⑤ 分体式行星架 Split planet carrier
⑥ 第一级行星轮 The first stage of planetary gear
⑦ 电机轴 Motor Shaft
⑧ 电机轴轴承 Bearing for the motor shaft
⑨ 电机机壳 Motor housing
⑩ 无刷电机定子 BLDC motor stator
⑪ 无刷电机转子 BLDC motor rotor
⑫ 电机后盖 End cover

Z	62	BLDP	24	60	-	30S /	62	PM	303
①	②	③	④	⑤		⑥	⑦	⑧	⑨

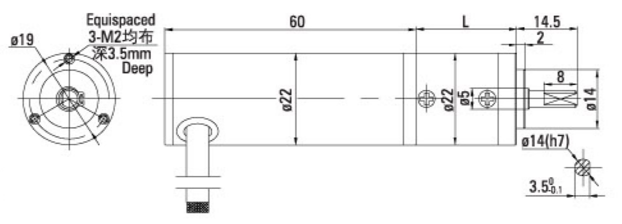
电机参数	①	广州欧特士传动设备有限公司标识 Haitec-GR®
	②	电机外径尺寸 Motor outline dimension 22:电机外径 Motor external diameter ø22mm 32:电机外径 Motor external diameter ø32mm 42:电机外径 Motor external diameter ø42mm 52:电机外径 Motor external diameter ø52mm 62:电机外径 Motor external diameter ø62mm
	③	电机型式： BLDP:无刷直流电机，配行星减速箱式 BLDC motor matched with planetary gearbox DP:有刷直流电机，碳刷内置（不可外部更换电刷），配行星减速箱式 Brush DC motor with inner brush (no brush replace ment from outside), matched with planetary gearbox
	④	电机使用额定电压 Rated voltage for the motor using 12:12V 24:24V
	⑤	电机输出额定功率 Rated output power for the motor 40:40W 60:60W
	⑥	电机输出额定转速 Rated output speed for the motor 20S:2000RPM 30S:3000RPM
齿轮箱参数	⑦	齿轮箱外径尺寸 The outline dimension for the gearbox 传动型系列transmission series 22:外径 External diameter ø22mm 32:外径 External diameter ø32mm 42:外径 External diameter ø42mm 52:外径 External diameter ø52mm 62:外径 External diameter ø62mm
	⑧	行星齿轮箱 Planetary gearbox PM:传动型行星(金属) Tansmission planetary (metal) PK:传动型行星(塑料) Transmission planetary (plastic)
	⑨	减速比 Reduction ratio 303:减速比Reduction ratio 1:303

Ø22 DC/BLDP直流有刷(无刷)行星齿轮减速电机
Ø22 DC BRUSH (BRUSHLESS) PLANETARY GEAR MOTOR

Z22DP2410-60S/22PM□直流有刷行星减速电机
Z22DP2410-60S/22PM□DC brush planetary gear motor

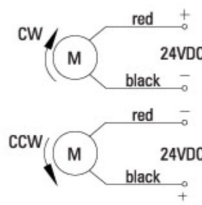


Z22BLDP2410-60S/22PM□直流无刷行星减速电机
Z22BLDP2410-60S/22PM□DC brushless planetary gear motor

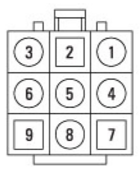


电动机型号 Motor type	减速箱型号 Gearbox type	减速比 Reduction ratio	L尺寸mm Dimension
Z22DP Z22BLDP	22PM□	3.65~8.63	24
		13~74	32.3
		87~643	40.6

Z22D电机接线图
Z22D motor wiring diagram



Z22BLD插孔示意图
Z22BLD plughole diagram



Z22BLD接线插孔对应信号说明
Z22BLD wiring plughole corre-sponding signal explanation

1	2	2	4	5
U	V	W	+5V	/
6	7	8	9	
GND	Hu	Hv	Hw	

■直流电机技术参数 DC MOTOR TECHNICAL DATA

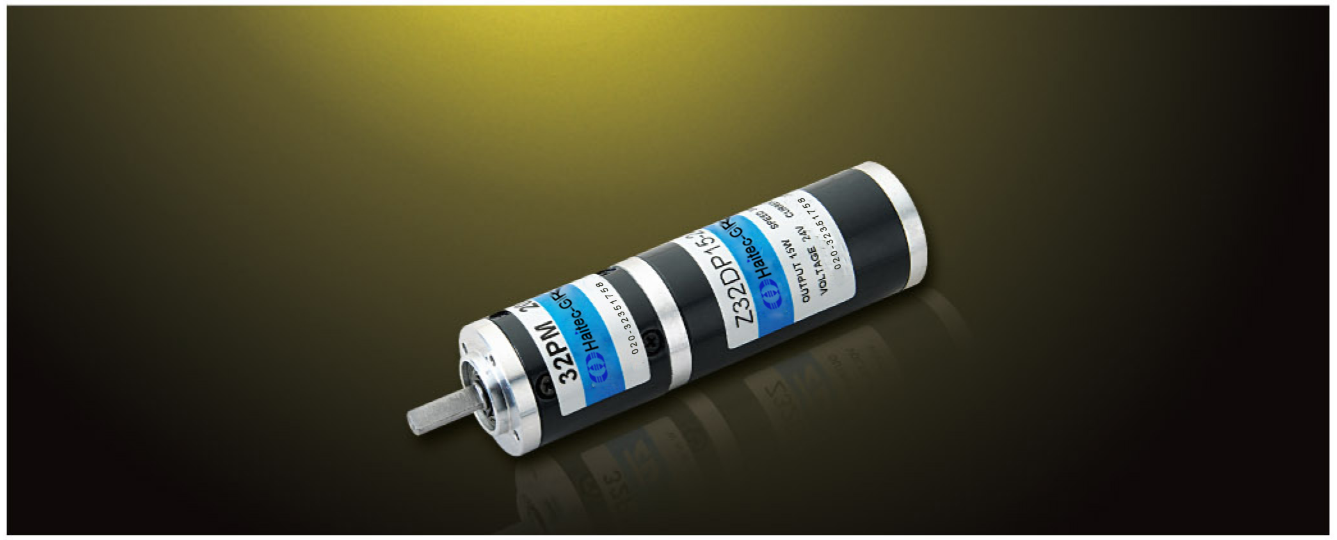
直流电机型号 Motor type	电压 Voltage	功率 Power	空载转速 No-load speed	空载电流 No-load current	额定转速 Rated speed	额定电流 Rated current	额定转矩 Rated torque	电机寿命 Motor life	电机重量 Motor weight
TYPE	V	W	RPM	A	RPM	A	N.M	H	Kg
Z22DP2410-60S	24	10	6500	0.3	6000	0.85	1.6	1000	0.5
Z22BLDP2410-60S	24	10	6500	0.3	6000	0.90	1.6	3000	0.5

■直流行星减速电机技术参数 DC PLANETARY GEAR MOTOR TECHNICAL DATA

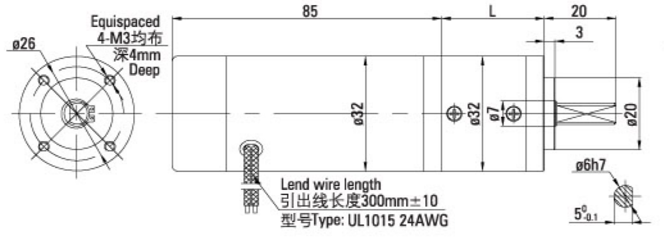
减速比 Reduction ratio	i	3.65	5.36	6.55	8.63	13	20	24	29	35	43	57	74		
空载转速 No-load speed	RPM	1780	1212	922	753	500	325	271	244	186	151	114	88		
额定转速 Rated speed	RPM	1644	1119	916	695	461	300	250	207	171	139	105	81		
额定转矩 Rated torque	N.M	0.052	0.077	0.094	0.12	0.18	0.29	0.34	0.4	0.4	0.4	0.4	0.4		
减速级数 Reduction stage		1	1	1	1	2	2	2	2	2	2	2	2		

减速比 Reduction ratio	i	87	105	128	154	169	188	206	248	272	303	370	399	488	643
空载转速 No-load speed	RPM	75	62	51	42	38	34	31	26	24	21	17	16	13	10
额定转速 Rated speed	RPM	67	57	47	39	35	32	29	24	22	20	16	15	12	9
额定转矩 Rated torque	N.M	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.6
减速级数 Reduction stage		3	3	3	3	3	3	3	3	3	3	3	3	3	3

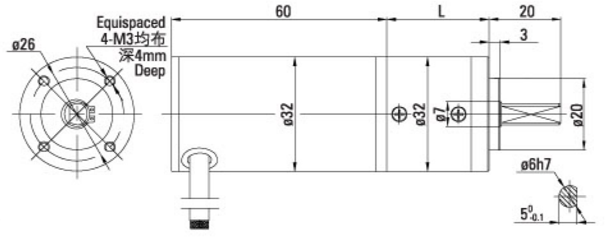
Ø32 DC/BLDP直流有刷(无刷)行星齿轮减速电机
Ø32 DC BRUSH (BRUSHLESS) PLANETARY GEAR MOTOR



Z32DP2415-30S/32PM□直流有刷行星减速电机
Z32DP2415-30S/32PM□DC brush planetary gear motor

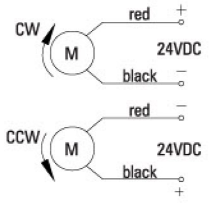


Z32BLDP2415-30S/32PM□直流无刷行星减速电机
Z32BLDP2415-30S/32PM□DC brushless planetary gear motor

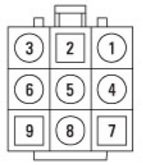


电动机型号 Motor type	减速箱型号 Gearbox type	减速比 Reduction ratio	L尺寸mm Dimension
Z32DP Z32BLDP	32PM□	3.65~8.63	28.5
		13~74	38.3
		87~643	48.1

Z32D电机接线图
Z32D motor wiring diagram



Z32BLD插孔示意图
Z32BLD plughole diagram



Z32BLD接线插孔对应信号说明
Z32BLD wiring plughole corresponding signal explanation

1	2	2	4	5
U	V	W	+5V	/
6	7	8	9	
GND	Hu	Hv	Hw	

■直流电机技术参数 DC MOTOR TECHNICAL DATA

无刷电机型号 Motor type	电压 Voltage	功率 Power	空载转速 No-load speed	空载电流 No-load current	额定转速 Rated speed	额定电流 Rated current	额定转矩 Rated torque	电机寿命 Motor life	电机重量 Motor weight
TYPE	V	W	RPM	A	RPM	A	N.M	H	Kg
Z32DP2415-30S	24	15	3500	0.5	3000	1.20	47.5	1000	0.8
Z32BLDP2415-30S	24	15	3500	0.5	3000	1.20	47.5	2000	0.8

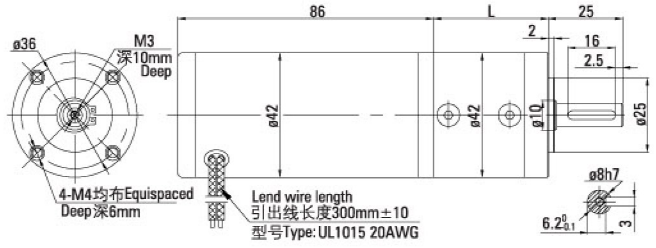
■直流行星减速电机技术参数 DC PLANETARY GEAR MOTOR TECHNICAL DATA- Z32DP2415-30S

减速比 Reduction ratio	i	3.65	5.36	6.55	8.63	13	20	24	29	35	43	57	74		
空载转速 No-load speed	RPM	956	653	534	405	269	175	146	121	100	83	61	47		
额定转速 Rated speed	RPM	822	560	458	348	225	153	126	105	85	70	53	40		
额定转矩 Rated torque	N.M	0.15	0.22	0.27	0.36	0.49	0.76	0.9	1.1	1.3	1.5	1.5	1.5		
减速级数 Reduction stage		1	1	1	1	2	2	2	2	2	2	2	2		

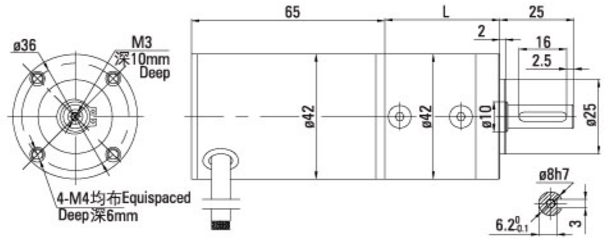
减速比 Reduction ratio	i	87	105	128	154	169	188	206	248	272	303	370	399	488	643
空载转速 No-load speed	RPM	40	33	27	23	21	19	17	14	13	11	9	8	7	6
额定转速 Rated speed	RPM	34	29	23	19	18	16	14	12	11	10	8	7	6	5
额定转矩 Rated torque	N.M	3	3.6	4	4	4	4	4	4	4	4	4	4	4	2.5
减速级数 Reduction stage		3	3	3	3	3	3	3	3	3	3	3	3	3	3

Ø42 DC/BLDP直流有刷(无刷)行星齿轮减速电机
Ø42 DC BRUSH (BRUSHLESS) PLANETARY GEAR MOTOR

Z42DP2425-30S/42PM□直流有刷行星减速电机
Z42DP2425-30S/42PM□DC brush planetary gear motor

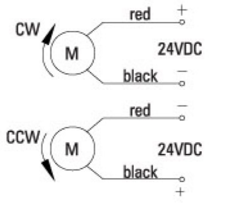


Z42BLDP2425-30S/42PM□直流无刷行星减速电机
Z42BLDP2425-30S/42PM□DC brushless planetary gear motor

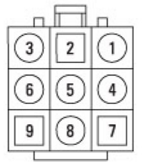


电动机型号 Motor type	减速箱型号 Gearbox type	减速比 Reduction ratio	L尺寸mm Dimension
Z42DP Z42BLDP	42PM□	3.65~8.63	38.6
		13~74	56.9
		87~643	75.2

Z42D电机接线图
Z42D motor wiring diagram



Z42BLD插孔示意图
Z42BLD plughole diagram



Z42BLD接线插孔对应信号说明
Z42BLD wiring plughole corresponding signal explanation

1	2	2	4	5
U	V	W	+5V	/
6	7	8	9	
GND	Hu	Hv	Hw	

■直流电机技术参数 DC MOTOR TECHNICAL DATA

直流电机型号 Motor type	电压 Voltage	功率 Power	空载转速 No-load speed	空载电流 No-load current	额定转速 Rated speed	额定电流 Rated current	额定转矩 Rated torque	电机寿命 Motor life	电机重量 Motor weight
TYPE	V	W	RPM	A	RPM	A	N.M	H	Kg
Z42DP2425-30S	24	25	3500	0.7	3000	1.8	79.6	1000	1.0
Z42BLDP2425-30S	24	25	3500	0.7	3000	1.7	79.6	3000	1.2

■直流行星减速电机技术参数 DC PLANETARY GEAR MOTOR TECHNICAL DATA- Z42DP2425-30S

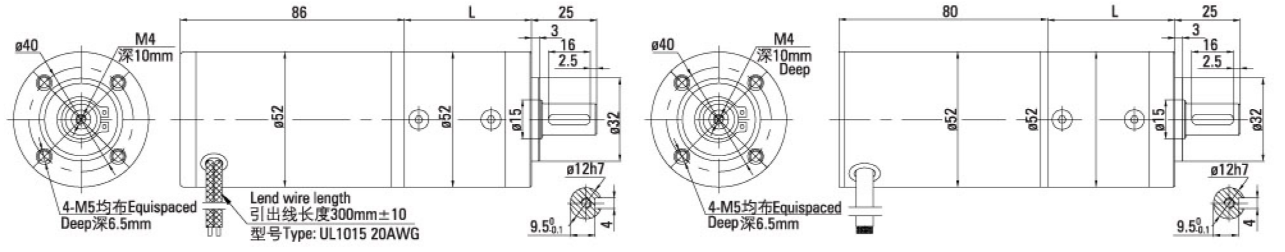
减速比 Reduction ratio	i	3.65	5.36	6.55	8.63	13	20	24	29	35	43	57	74		
空载转速 No-load speed	RPM	956	653	534	405	269	175	146	121	100	83	61	47		
额定转速 Rated speed	RPM	822	560	458	348	225	153	126	105	85	70	53	40		
额定转矩 Rated torque	N.M	0.26	0.38	0.46	0.61	0.8	1.3	1.5	1.9	2.2	2.5	2.5	2.5		
减速级数 Reduction stage		1	1	1	1	2	2	2	2	2	2	2	2		

减速比 Reduction ratio	i	87	105	128	154	169	188	206	248	272	303	370	399	488	643
空载转速 No-load speed	RPM	40	33	27	23	21	19	17	14	13	11	9	8	7	6
额定转速 Rated speed	RPM	34	29	23	19	18	16	14	12	11	10	8	7	6	5
额定转矩 Rated torque	N.M	5	6	7.4	8.9	9.7	10.8	11.9	14.3	15	15	15	15	15	10
减速级数 Reduction stage		3	3	3	3	3	3	3	3	3	3	3	3	3	3

Ø52 DC/BLDP直流有刷(无刷)行星齿轮减速电机
Ø52 DC BRUSH (BRUSHLESS) PLANETARY GEAR MOTOR

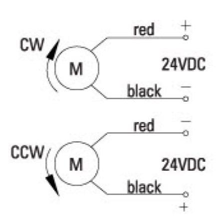
Z52DP2440-30S/52PM□直流有刷行星减速电机
Z52DP2440-30S/52PM□DC brush planetary gear motor

Z52BLDP2440-30S/52PM□直流无刷行星减速电机
Z52BLDP2440-30S/52PM□DC brushless planetary gear motor

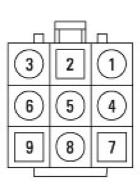


电动机型号 Motor type	减速箱型号 Gearbox type	减速比 Reduction ratio	L尺寸mm Dimension
Z52DP Z52BLDP	52PM□	3.65~8.63	48.7
		13~74	65.1
		87~643	81.5

Z52D电机接线图
Z52D motor wiring diagram



Z52BLD插孔示意图
Z52BLD plughole diagram



Z52BLD接线插孔对应信号说明
Z52BLD wiring plughole corresponding signal explanation

1	2	2	4	5
U	V	W	+5V	/
6	7	8	9	
GND	Hu	Hv	Hw	

■直流电机技术参数 DC MOTOR TECHNICAL DATA

无刷电机型号 Motor type	电压 Voltage	功率 Power	空载转速 No-load speed	空载电流 No-load current	额定转速 Rated speed	额定电流 Rated current	额定转矩 Rated torque	电机寿命 Motor life	电机重量 Motor weight
TYPE	V	W	RPM	A	RPM	A	N.M	H	Kg
Z52DP2440-30S	24	40	3300	0.8	3000	2.50	127.3	2000	1.5
Z52BLDP2440-30S	24	40	3300	0.8	3000	2.40	127.3	5000	1.8

■直流行星减速电机技术参数 DC PLANETARY GEAR MOTOR TECHNICAL DATA- Z52DP2440-30S

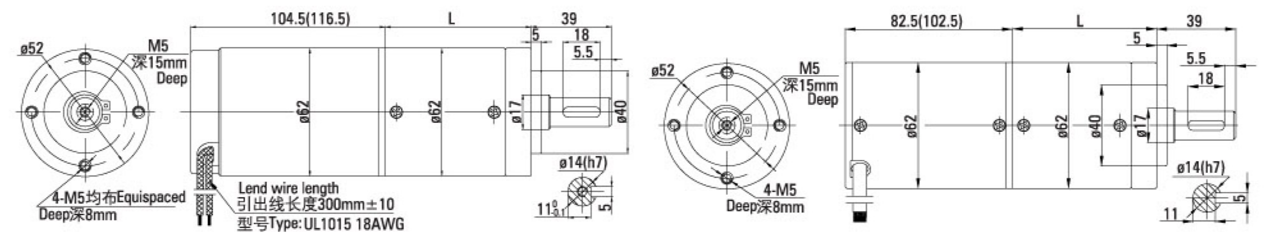
减速比 Reduction ratio	i	3.65	5.36	6.55	8.63	13	20	24	29	35	43	57	74		
空载转速 No-load speed	RPM	9.4	616	504	382	254	165	137	114	94	77	58	44		
额定转速 Rated speed	RPM	822	560	458	348	225	153	126	105	85	70	53	40		
额定转矩 Rated torque	N.M	042	0.63	0.76	1	1.4	2.1	2.5	3	3.7	4	4	4		
减速级数 Reduction stage		1	1	1	1	2	2	2	2	2	2	2	2		

减速比 Reduction ratio	i	87	105	128	154	169	188	206	248	272	303	370	399	488	643
空载转速 No-load speed	RPM	38	31	26	21	19	17	16	13	12	11	9	8	7	5
额定转速 Rated speed	RPM	34	29	23	19	18	16	14	12	11	10	8	7	6	5
额定转矩 Rated torque	N.M	8.3	9.9	12.1	14.6	16	17.8	19.5	23.5	25	25	25	25	25	20
减速级数 Reduction stage		3	3	3	3	3	3	3	3	3	3	3	3	3	3

Ø62 DC/BLDP直流有刷(无刷)行星齿轮减速电机
Ø62 DC BRUSH (BRUSHLESS) PLANETARY GEAR MOTOR

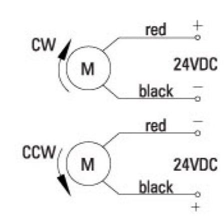
Z62(W)DP2460-30S/62M□直流有刷行星减速电机
Z62(W)DP2460-30S/62M□DC brush planetary gear motor

Z62BLDP2460-30S/62PM□直流无刷行星减速电机
Z62BLDP2460-30S/62PM□DC brushless planetary gear motor

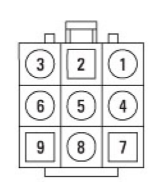


电动机型号 Motor type	减速箱型号 Gearbox type	减速比 Reduction ratio	L尺寸mm Dimension
Z62DP Z62BLDP	62PM□	3.65~8.63	53
		13~74	71
		87~643	89

Z62D电机接线图
Z62D motor wiring diagram



Z62BLD插孔示意图
Z62BLD plughole diagram



Z62BLD接线插孔对应信号说明
Z62BLD wiring plughole corresponding signal explanation

1	2	2	4	5
U	V	W	+5V	/
6	7	8	9	
GND	Hu	Hv	Hw	

■直流电机技术参数DC MOTOR TECHNICAL DATA（90W电机长度为括号中尺寸Motor length refers to the dimensions in the brackets）

直流电机型号 Motor type	电压 Voltage	功率 Power	空载转速 No-load speed	空载电流 No-load current	额定转速 Rated speed	额定电流 Rated current	额定转矩 Rated torque	电机寿命 Motor life	电机重量 Motor weight
TYPE	V	W	RPM	A	RPM	A	N.M	H	Kg
Z62DP2460-30S	24	60	3500	1.0	3000	4.0	0.19	2000	1.8
Z62BLDP2460-30S	24	60	3600	1.0	3000	4.0	0.19	5000	2.0
Z62DP2490-30S	24	90	3500	1.0	3000	5.5	0.29	2000	2.0
Z62BLDP2490-30S	24	90	3500	1.0	3000	5.5	0.29	5000	2.3

■直流行星减速电机技术参数DC PLANETARY GEAR MOTOR TECHNICAL DATA- Z62(W)DP2460-30S

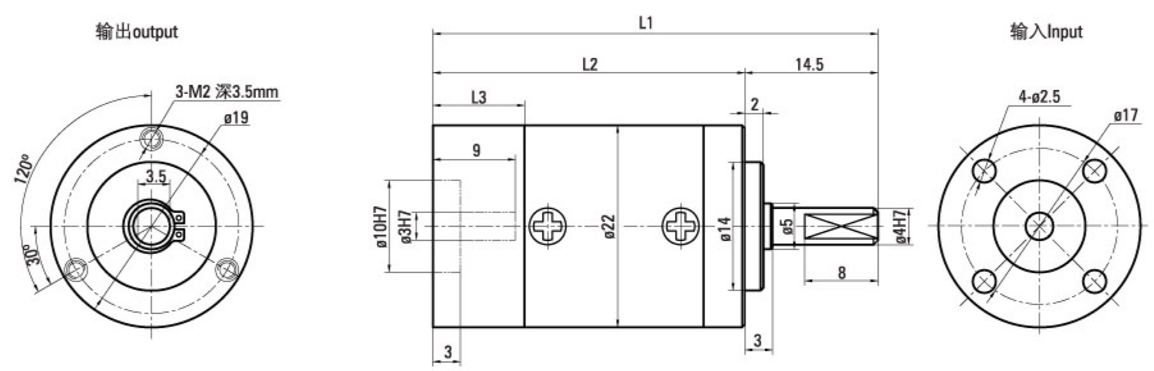
减速比 Reduction ratio	i	3.65	5.36	6.55	8.63	13	20	24	29	35	43	57	74		
空载转速 No-load speed	RPM	956	653	534	405	269	175	146	121	100	83	61	47		
额定转速 Rated speed	RPM	822	560	458	348	225	153	126	105	85	70	53	40		
额定转矩 Rated torque	N.M	0.62	0.9	1.1	1.5	2	3	3.7	4.5	5.4	6.6	8.8	11.4		
减速级数 Reduction stage		1	1	1	1	2	2	2	2	2	2	2	2		

减速比 Reduction ratio	i	87	105	128	154	169	188	206	248	272	303	370	399	488	643
空载转速 No-load speed	RPM	40	33	27	23	21	19	17	14	13	11	9	8	7	6
额定转速 Rated speed	RPM	34	29	23	19	18	16	14.5	12	11	10	8	7	6	5
额定转矩 Rated torque	N.M	12	14.5	17.7	21.3	23.4	26	28.5	34.4	37.7	42	45	45	45	30
减速级数 Reduction stage		3	3	3	3	3	3	3	3	3	3	3	3	3	3

PMØ22 传动型行星减速机

PMØ22 PLANETARY GEAR MOTOR FOR TRANSMISSION

机械参数 DIMENSIONS



■技术资料 Technical Data

传动级数 Transmission stage	一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission
传动效率 Transmission efficiency	90%	81%	73%
最大径向负载 Max radial load	80N	80N	80N
最大轴向负载 Max axial load	30N	30N	30N
瞬间承受扭矩 Instant beared torque	3倍于额定扭矩 Three times of the rated torque		
工作温度 Operating temperature	-10℃～+80℃		
润滑方式 Lubrication type	终身润滑 Lifetime lubrication		
安装方式 Mounting type	任意安装 Any		
推荐输入转速 Recommend input speed	3000RPM		
输入与输出 Input and output	同向 Same direction		
齿轮箱长度L1 / Gearbox length	48.5mm	56.8mm	65.1mm
箱体长度L2 / Body length	34mm	42.3mm	50.6mm
后盖长度L3 / End-cover length		10mm	

第一级行星轮材料 Stage 1 planetary material		一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission
传动扭矩 Transmission torque	塑料 Plastic POM	0.2N.M	0.7N.M	0.8N.M
	金属 Metal 40Cr	0.6N.M	0.7N.M	0.8N.M
噪声 Noise	塑料 Plastic POM	45dB(A)		
	金属 Metal 40Cr	60dB(A)		

■速比排列 Reduction ratio list

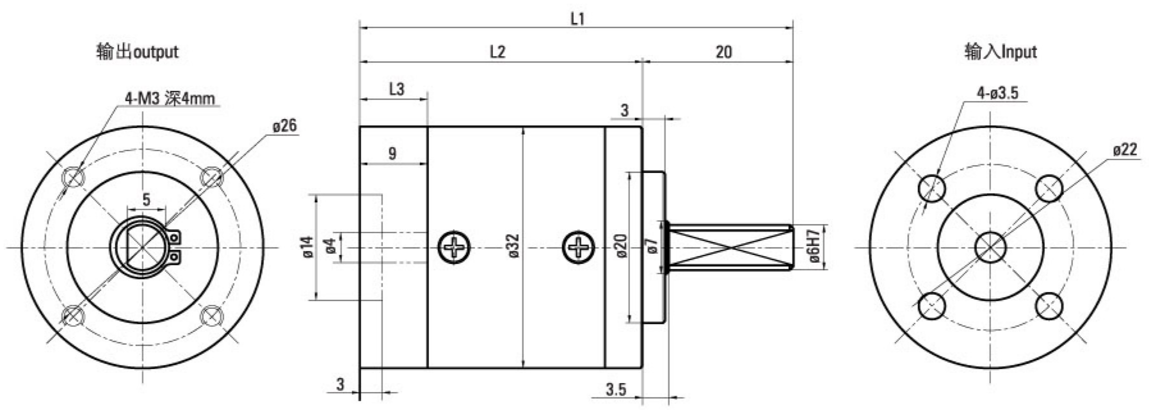
一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission	
3.7	14(13.8)	51(50.6)	168(168.5)
5.18	19(19.1)	71(70.9)	181(181.1)
6.75	25(24.9)	92(92.4)	236(236)
	27(26.8)	99(99.2)	307(307.5)
	35(34.9)	129(129.3)	
	45 (45.5)	139(139)	

● 作用在额定扭矩下第一级行星两种材质的寿命相同，塑料材质一般用于同直径电机。
● 输入端可以按电机的尺寸合理调节:1. 可调尺寸:止口直径ø20H7，止口深度3.2。 电机轴有效长度9 (变化齿轮长度成正比) 3. 可调尺寸:后盖的直径大小。
● 输出端可以按客户特殊要求特配； 1. 出轴直径不能超过ø4，安装凸台不能小于直径ø14。2. 输出法兰可为方型。
● The lifetime of the two materials for the stage 1 planetary is the same under the circumstance of rated torque. plastic material is generally used for the motor with same diameter.● The input end can be adjusted according to the motor dimension: **1.** adjustable dimension: spigot diameter Ø20H7, spigot depth 3. **2.** motor shaft effective length 9 (it is is proportional to the change of gear length) **3.** djustable dimension: end-cover diameter. ● The output end can be decided by the customer: **1.** the output diameter can not be exceed 4, assembling allocating convex can not be less than 14. **2.** output flange can be square.

PMØ32 传动型行星减速机

PMØ32 PLANETARY GEAR MOTOR FOR TRANSMISSION

机械参数 DIMENSIONS



■技术资料 Technical Data

传动级数 Transmission stage	一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission
传动效率 Transmission efficiency	90%	81%	73%
最大径向负载 Max radial load	80N	115N	140N
最大轴向负载 Max axial load	30N	40N	50N
瞬间承受扭矩 Instant beared torque	3倍于额定扭矩 Three times of the rated torque		
工作温度 Operating temperature	-10℃～+80℃		
润滑方式 Lubrication type	终身润滑 Lifetime lubrication		
安装方式 Mounting type	任意安装 Any		
推荐输入转速 Recommend input speed	3000RPM		
输入与输出 Input and output	同向 Same direction		
齿轮箱长度L1 / Gearbox length	57.5mm	67.3mm	77.1mm
箱体长度L2 / Body length	37.5mm	47.3mm	57.1mm
后盖长度L3 / End-cover length		9mm	

第一级行星轮材料 Stage 1 planetary material		一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission
传动扭矩 Transmission torque	塑料 Plastic POM	0.4N.M	1.5～2.25N.M	4N.M
	金属 Metal 40Cr	1N.M	2.25N.M	4N.M
噪声 Noise	塑料 Plastic POM	45dB(A)		
	金属 Metal 40Cr	60dB(A)		

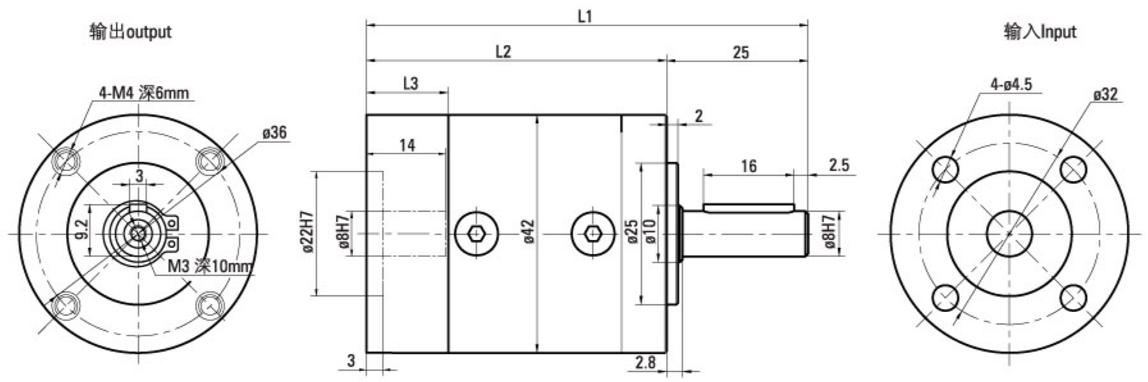
■速比排列 Reduction ratio list

一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission	
3.7	14(13.8)	51(50.6)	168(168.5)
5.18	19(19.1)	71(70.9)	181(181.1)
6.75	25(24.9)	92(92.4)	236(236)
	27(26.8)	99(99.2)	307(307.5)
	35(34.9)	129(129.3)	
	45 (45.5)	139(139)	

● 作用在额定扭矩下第一级行星两种材质的寿命相同，塑料材质一般用于同直径电机。●输入端可以按电机的尺寸合理调节:1. 可调尺寸:止口直径ø20H7，止口深度3.2。2. 电机轴有效长度9 (变化齿轮长度成正比) 3. 可调尺寸:后盖的直径大小。● 输出端可以按客户特殊要求特配； 1. 出轴直径不能超过ø7，安装凸台不能小于直径ø20。2. 输出法兰可为方型。
● The lifetime of the two materials for the stage 1 planetary is the same under the circumstance of rated torque. plastic material is generally used for the motor with same diameter.● The input end can be adjusted according to the motor dimension: **1.** adjustable dimension: spigot diameter Ø20H7, spigot depth 3.2. **2.** motor shaft effective length 9 (it is is proportional to the change of gear length) **3.** djustable dimension: end-cover diameter. ● The output end can be decided by the customer: **1.** the output diameter can not be exceed 7, assembling allocating convex can not be less than 20. **2.** output flange can be square.

PMØ42 传动型行星减速机
PMØ42 PLANETARY GEAR MOTOR FOR TRANSMISSION

机械参数 DIMENSIONS



■技术资料 TECHNICAL DATA

传动级数 Transmission stage	一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission
传动效率 Transmission efficiency	90%	81%	73%
最大径向负载 Max radial load	160N	230N	300N
最大轴向负载 Max axial load	50N	80N	110N
瞬间承受扭矩 Instant beared torque	3倍于额定扭矩 Three times of the rated torque		
工作温度 Operating temperature	-10℃～+80℃		
润滑方式 Lubrication type	终身润滑 Lifetime lubrication		
安装方式 Mounting type	任意安装 Any		
推荐输入转速 Recommend input speed	3000RPM		
输入与输出 Input and output	同向 Same direction		
齿轮箱长度L1 / Gearbox length	78.1mm	90.9mm	103.7mm
箱体长度L2 / Body length	53.1mm	65.9mm	78.7mm
后盖长度L3 / End-cover length		14.5mm	

第一级行星轮材料 Stage 1 planetary material		一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission
传动扭矩 Transmission torque	塑料 Plastic POM	0.7N.M	2.5～6N.M	15N.M
	金属 Metal 40Cr	3N.M	7.5N.M	15N.M
噪声 Noise	塑料 Plastic POM	45dB(A)		
	金属 Metal 40Cr	60dB(A)		

■速比排列 Reduction ratio list

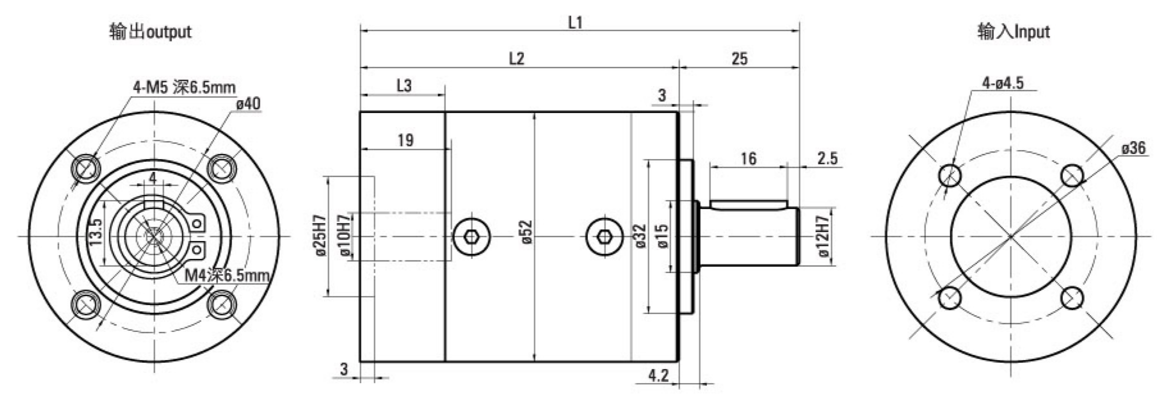
一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission	
3.65	13(13.3)	49(48.63)	188(188.2)
5.36	20(19.5)	71(71.4)	206(206.3)
6.55	24(23.9)	87(87.2)	248(247.9)
8.63	31(31.5)	105(104.8)	272(271.8)
	29(28.7)	115(114.9)	281(281)
	35(35.1)	128(128.1)	303(302.9)
	43(42.9)	154(154)	370(370.2)
	46(46.2)	157(156.6)	399(399.2)
	56(56.5)	169(168.8)	489(488.8)

● 作用在额定扭矩下第一级行星两种材质的寿命相同，塑料材质一般用于同直径电机。●输入端可以按电机的尺寸合理调节: 1. 可调尺寸:止口直径ø22H7，止口深度3。 2. 电机轴有效长度14 (变化齿轮长度成正比) 。3. 可调尺寸:后盖的直径大小。● 输出端可以按客户特殊要求特配： 1. 出轴直径不能超过ø10，安装凸台不能小于直径ø25。2. 输出法兰可为方型。

● the lifetime of the two materials for the stage 1 planetary is the same under the circumstance of rated torque. plastic material is generally used for the motor with same diameter.● the input end can be adjusted according to the motor dimension: **1.** adjustable dimension: spigot diameter Ø22H7, spigot depth 3. **2.** motor shaft effective length 14 (it is is proportional to the change of gear length) **3.** djustable dimension: end-cover diameter. ● the output end can be decided by the customer: **1.** the output diameter can not be exceed 10, assembling allocating convex can not be less than 25. **2.** output flange can be square.

PMØ52 传动型行星减速机
PMØ52 PLANETARY GEAR MOTOR FOR TRANSMISSION

机械参数 DIMENSIONS



■技术资料 TECHNICAL DATA

传动级数 Transmission stage	一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission
传动效率 Transmission efficiency	90%	81%	73%
最大径向负载 Max radial load	200N	320N	450N
最大轴向负载 Max axial load	60N	100N	150N
瞬间承受扭矩 Instant beared torque	3倍于额定扭矩 Three times of the rated torque		
工作温度 Operating temperature	-10℃～+80℃		
润滑方式 Lubrication type	终身润滑 Lifetime lubrication		
安装方式 Mounting type	任意安装 Any		
推荐输入转速 Recommend input speed	3000RPM		
输入与输出 Input and output	同向 Same direction		
齿轮箱长度L1 / Gearbox length	91.4mm	107.8mm	124.2mm
箱体长度L2 / Body length	66.4mm	82.8mm	99.2mm
后盖长度L3 / End-cover length		17.7mm	

第一级行星轮材料 Stage 1 planetary material		一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission
传动扭矩 Transmission torque	塑料 Plastic POM	1.2N.M	4～10N.M	25N.M
	金属 Metal 40Cr	4N.M	12N.M	25N.M
噪声 Noise	塑料 Plastic POM	45dB(A)		
	金属 Metal 40Cr	60dB(A)		

■速比排列 Reduction ratio list

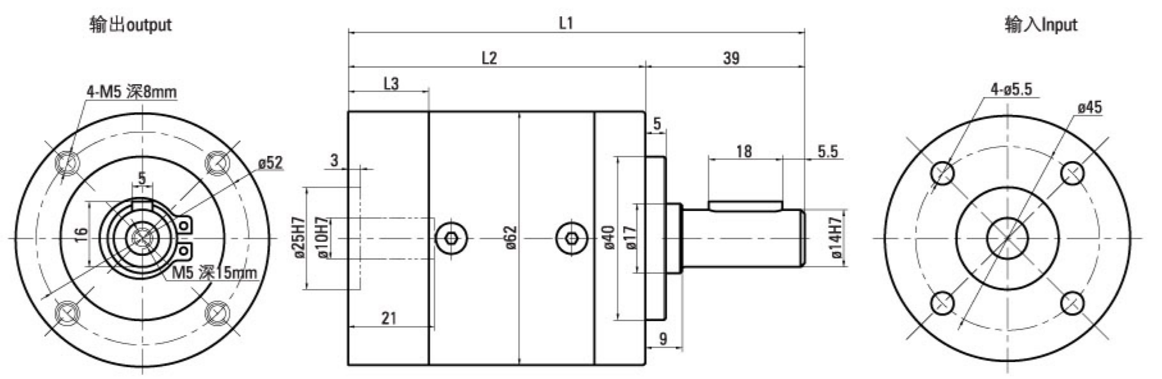
一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission	
3.65	13(13.3)	49(48.63)	188(188.2)
5.36	20(19.5)	71(71.4)	206(206.3)
6.55	24(23.9)	87(87.2)	248(247.9)
8.63	31(31.5)	105(104.8)	272(271.8)
	29(28.7)	115(114.9)	281(281)
	35(35.1)	128(128.1)	303(302.9)
	43(42.9)	154(154)	370(370.2)
	46(46.2)	157(156.6)	399(399.2)
	56(56.5)	169(168.8)	489(488.8)

● 作用在额定扭矩下第一级行星两种材质的寿命相同，塑料材质一般用于同直径电机。●输入端可以按电机的尺寸合理调节: 1. 可调尺寸:止口直径ø25H7，止口深度3。2. 电机轴有效长度19 (变化齿轮长度成正比) 3. 可调尺寸:后盖的直径大小。● 输出端可以按客户特殊要求特配： 1. 出轴直径不能超过ø15，安装凸台不能小于直径ø32。2. 输出法兰可为方型。

● the lifetime of the two materials for the stage 1 planetary is the same under the circumstance of rated torque. plastic material is generally used for the motor with same diameter.● the input end can be adjusted according to the motor dimension: **1.** adjustable dimension: spigot diameter Ø25H7, spigot depth 3. **2.** motor shaft effective length 21 (it is is proportional to the change of gear length) **3.** djustable dimension: end-cover diameter. ● the output end can be decided by the customer: **1.** the output diameter can not be exceed 15, assembling allocating convex can not be less than 32. **2.** output flange can be square.

PMØ62 传动型行星减速机
PMØ62 PLANETARY GEARBOX FOR TRANSMISSION

机械参数 DIMENSIONS



■技术资料 TECHNICAL DATA

传动级数 Transmission stage	一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission
传动效率 Transmission efficiency	90%	81%	73%
最大径向负载 Max radial load	240N	360N	520N
最大轴向负载 Max axial load	70N	100N	150N
瞬间承受扭矩 Instant beared torque	3倍于额定扭矩 Three times of the rated torque		
工作温度 Operating temperature	-10℃～+80℃		
润滑方式 Lubrication type	终身润滑 Lifetime lubrication		
安装方式 Mounting type	任意安装 Any		
推荐输入转速 Recommend input speed	3000RPM		
输入与输出 Input and output	同向 Same direction		
齿轮箱长度L1 / Gearbox length	111.7mm	129.6mm	147.5mm
箱体长度L2 / Body length	72.7mm	90.6mm	108.5mm
后盖长度L3 / End-cover length		19.7mm	

第一级行星轮材料 Stage 1 planetary material		一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission
传动扭矩 Transmission torque	塑料 Plastic POM	4.5N.M	15～25N.M	45N.M
	金属 Metal 40Cr	8N.M	25N.M	45N.M
噪声 Noise	塑料 Plastic POM	45dB(A)		
	金属 Metal 40Cr	60dB(A)		

■速比排列 Reduction ratio list

一级传动 Stage 1 transmission	二级传动 Stage 2 transmission	三级传动 Stage 3 transmission	
3.65	13(13.3)	49(48.63)	188(188.2)
5.36	20(19.5)	71(71.4)	206(206.3)
6.55	24(23.9)	87(87.2)	248(247.9)
8.63	31(31.5)	105(104.8)	272(271.8)
	29(28.7)	115(114.9)	281(281)
	35(35.1)	128(128.1)	303(302.9)
	43(42.9)	154(154)	370(370.2)
	46(46.2)	157(156.6)	399(399.2)
	56(56.5)	169(168.8)	489(488.8)

● 作用在额定扭矩下第一级行星两种材质的寿命相同，塑料材质一般用于同直径电机。●输入端可以按电机的尺寸合理调节:1. 可调尺寸:止口直径ø25H7，止口深度3。2. 电机轴有效长度21（变化齿轮长度成正比）3. 可调尺寸:后盖的直径大小。● 输出端可以按客户特殊要求特配： 1. 出轴直径不能超过17，安装凸台不能小于40。2. 输出法兰可为方型。

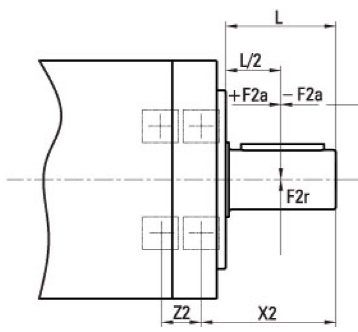
●The lifetime of the two materials for the stage 1 planetary is the same under the circumstance of rated torque. plastic material is generally used for the motor with same diameter.

●The input end can be adjusted according to the motor dimension: **1.** adjustable dimension: spigot diameter ø25H7, spigot depth 3. **2.** motor shaft effective length 21 (it is is proportional to the change of gear length) **3.** adjustable dimension: end-cover diameter

●The output end can be decided by the customer: **1.** the output diameter can not be exceed 17, assembling allocating convex can not be less than 40. **2.** the output flange can be square.

参数定义与减速器的选型
PARAMETER AND SELECTION OF GEARBOX TYPE

参数定义 PARAMETER



（图1）

1. 额定输入转速(电机额定转速)n1[rpm]：在环境温度为20°C 的条件下机械设备在正常运行的工作状况下的转速。
2. 额定输入功率(电机额定功率)W：直流电路中，额定电压与额定电流的乘积就是电器的额定功率。
3. 减速比i：减速比是机械工程中评价减速机的一个重要指标。减速机通过齿轮等传动方式将输入轴输入的转速变换成输出轴的转。
4. 额定输出转速 n2[rpm]：额定输出转速按照下列公式通过额定输入转速和传动比i计算出来
   n2=n1/i
   例如：电机额定转速输入3000RPM，齿轮箱总减速比i=1:50,n2=3000RPM/50=60RPM。
5. 传动效率[η]：由于摩擦引起的损失总是使有效率小于1，也就是少于100%。样本上的效率是齿轮箱在满负荷运动情况下，减速机的传输效率。
6. 额定输出扭矩 TN[N.m]： 指减速机长时间（连续工作制）可以加载的力矩（无磨损），条件应满足负载均匀，弯曲安全系数>2.5。额定输出转速按照下列公式通过额定输入转速和传动比i及传动效率[η]和输入额定功率计算出来
   TN=(W·9.55/3000)·i·η总
   例如：直流电机额定输出90W,额定转速3000RPM,齿轮箱总减速比i=1:50,传动动总效率 η 总81%,则额定输出扭矩 TN=(90·9.55/3000) ·50·0.81=11.6 N.m。
7. 直流电机的一般规格
a. 绝缘电阻：于常温与常湿下的电动机额定运行后，以DC500V的电阻表测量线圈与外壳时，测量值在200MΩ以上
b. 绝缘耐压：于常温与常湿下的电动机额定运行后，在线圈与外壳间施加一分钟50Hz或60Hz、1.5kV(三相400V为2 kV)的电压，亦无异常
c. 电机温升：运转电机后，用温度度法来测量时，电机表机最热点温升值在80K以下
d. 绝缘等级：B级（130℃）
e. 使用温度：-10～40℃（无冰冻）
f. 使用湿度：80%以下（无结露的场所）
8. 直流行星减速电机在电机与行星同直径时，行星齿轮箱（传动型）第一级行星齿轮使用塑料齿轮，第二级、第三级使用金属齿轮。
9. 寿命：指在减速电机在额定负载下，额定输入转速时的连续工作时间，直流有刷电机的寿命是由碳刷决定，一般碳刷使用寿命2000小时，直流有刷电机有碳刷外置与内置两种，外置碳刷可换，内置碳刷不可换。
10. 瞬间急停扭矩[N.m]：指减速输出端所能加载的最大扭矩。输出齿轮是金属材料的情况下加载到最大扭矩时齿轮的弯曲安全系数为1
11. 轴向力F2A[N.m]:是指平行于轴心一个力，它的作用点与输出轴端有一定的轴向偏差（y2）时，会形成一个额定的弯挠力矩。（见图1）
12. 轴向力F2R[N.m]：指垂直作用于轴向的一个力，客观存在的作用点与轴端有一定的轴向距离（X2），这个点成一个杠杆作用，横向力形成一个弯挠力矩
13. 回程间隙：指减速电机输出轴与输入轴的最大偏角差，测量时输出轴用加载一定力矩（2%TN），测量时以输出的信号脉冲通过编码器获得测量数据，测量最小为1弧分，分别可以测量回程间隙与传动误差。
14. 弧分（arcmin）:一度为60弧分（60 arcmin=60′ ），如回程间隙为1 arcmin时，减速机输入一转，输出端的角偏差为1/60°，在实际应用过程中，角偏差与轴的直径有关
    b=2·π·r·a°例如80PLE系列精度行星输轴半径12.5mm,减速机精度为3 arcmin时,减速机转一转偏差为0.01mm
15. 转动惯量: 刚体绕轴转动惯性的度量，与物体的质量、直径、回转中心等有关。高精度行星的转动惯量与输入轴有关。
16. 抗扭钢性(N. m/arcmin)：由加载力矩的所产生扭转角之间的比率来定义，它说明需要多大的力矩才能把输出轴转动一个弧分
17. 定位精确度：在高速机械往复运动中作到精确定位的关键在于尽量减少通过运动产生的角偏差，定位精确度取决于两个值，一个是与加载有关的偏转角，涉及到回程间隙与扭转钢性，另一个是与运动控制有关的偏转角，涉及到同步偏差问题。
18. 噪声dB(A)：减速器的速比与输入转速直接影响到噪声的大小，转速越高，噪声也就越大，速速比越大，噪声了就越小，在高精度行星噪声测量，是不带负载下，输入3000RPM，测量距离为1m时测得。直流行星减速器测量是不带负载下，输入3000RPM，测量距离为40mm时测得.

减速器的选型 SELECTION OF GEARBOX TYPE

选用减速机应考虑其结构类型、安装形式、承载能力、输出转速、工作条件等因素。减速机规格的确定：减速机的承载能力是在额定转速下，每天工作10小时，每小时启动数少于10 次，平稳无冲击的条件下得出的，所以应按以下步骤进行选型。

检查所选配置 OPTION CHECKING LIST

■ 根据负载类型、每小时启停次数和预期工作寿命确定使用系数fs

使用系数fs						
负载类型	每小时启动次数 Z	每日运行时间(h)				
		h<4	4<h<8	8<h<12	12<h<16	16<h<24
均匀负载	Z<10	0.85	0.95	1.00	1.20	1.60
	10<Z<30	0.90	1.10	1.15	1.40	1.80
	30<Z<100	1.00	1.20	1.30	1.60	2.00
中等负载	Z<10	1.00	1.20	1.30	1.60	2.00
	10<Z<30	1.10	1.35	1.45	1.80	2.20
	30<Z<100	1.20	1.45	1.60	2.00	2.40
重负载	Z<10	1.20	1.45	1.60	2.00	2.40
	10<Z<30	1.30	1.55	1.75	2.20	2.60
	30<Z<100	1.40	1.65	1.90	2.40	2.80

■ 根据所需扭矩Tr2按以下公式得出计算扭矩:

Tc2= Tr2 * fs
Tc2—计算用扭矩
Tr2—实际所需扭矩
fs—使用系数
所选减速机的额定扭矩TN必须大于这个扭矩

■ 由所要求的输出转速n2和输入转速n1传动比：i= n1 / n2

■ 确定了Tc2和i后，根据减速机额定值表，选择最接近计算值的传动比并满足以下条件的减速机型号：Tn ≥ Tc2

■ 悬臂载荷

输入轴和输出轴上的悬臂载荷可通过下列公式求出：
FC1-2 = (2000 * Tr1-2 * Kr) /d
Fc1-2悬臂载荷(N)
1=表示输入轴
2=表示输出轴
Tr1-2轴上的扭矩(Nm)

d传动部件的分度圆直径(链轮,齿轮,带轮等)(mm)
Kr =1.0链条传动
Kr =1.25齿轮传动
Kr =1.5-2.0 V形带传动

如需要延长工作寿命,在下列表中选择寿命系数fL.

工作寿命	5000h	10000h	20000h	25000h	50000h	100000h
fL	0.66	0.81	0.81	1.32	1.62	2.00

此时 Fr1-2r ≥ Fc1-2 * fL
Fr1-2 — 输入轴和输出轴中点的额定径向力[N]

■ 输出轴

对于作用在轴中点的负载，需要按以下公式校核：
Frn2 ≥ Fr c2 * fL
这里Fr n2是指输出轴中点的额定径向载荷，Fr c2是指输出轴计算用径向力
若悬臂载荷不在轴中点上，确定偏移距离X，在相关图表中查找径向载荷位置系数fx2，且必须满足以下条件：
Frx2 = Frn2 * fx2 ≥ Frc2 * fL
这里Frx2是指在轴中心点的容许悬臂载荷
确定径向载荷Frc2
确定轴向载荷Fac2
载荷Fr c2的偏移距离
查询相应减速机的图表，确定与距离相对应，并且Fac2/Frc2比值接近Fan2 / Frn2比值的径向载荷Rx2。必须满足以下条件：Frx2 ≥ Frc2
图表中的值适用于：n2 = 100rpm，20000小时理论工作寿命或n2 = 50rpm，10000小时理论工作寿命
对于不同的输出转速n2和工作寿命，需要考虑:
下表中所示的速度系数fn2：

n2	10	25	50	100	250	500	1000
fn2	2.00	1.51	1.23	1.00	0.76	0.62	0.50

寿命系数表中所示的工作寿命系数fL，必须满足以下条件：Fr n2 * fn2 ≥ Fr c2 * fL

■ 电机选型

确定减速机实际所需扭矩Tr2，输入转速n1，效率 η ，根据公式计算减速机所需的输入功率
Pr1=Tr2 * n1 / 9549 * η *i (效率 η 的值在减速机技术参数表中有说明)
按照以下条件，在电机选型表中选择合适的电机：
Pn （ 电机额定功率 ）≥ Pr1
对于非连续工作制S1条件下使用的电机，电机额定值可以运用调节系数调整；四极电机或更低转速电机优先选择。