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深圳市爱博科技有限公司
SHENZHEN AIBO TECHNOLOGY CO.,LTD

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地址：深圳市南山区龙珠大道新屋村工业大厦东座6楼
电话：86-0755-26785810
传真：86-0755-26786070
邮箱：market@aibotech.net
邮编：518055
网址：http://www.aibotech.net
全国免费服务电话：400 580 028（技术/销售）



Company profile

公司简介



深圳市爱博科技有限公司成立于2005年，是一家专业研发、生产和销售智能纠偏系统、智能张力控制系统、精密减速机系列产品为一体的高新技术企业。已经通过了ISO9001质量体系认证。

公司以创新的理念，研发出行业独有的专利技术，开发出了智能卷材控制系统、精密减速机系列产品，并得到“科技部小企业创新基金”的无偿帮助。

深圳市爱博科技有限公司有专业的研发团队，公司巨资从日本引进专业研发人员，聘请国内日资公司优秀研发、技术人才。全日资生产企业为公司提供高精密的部件供应。公司可以根据不同客户的需求，研发制造高精度、高品质的精密减速机。

目前公司产品已经广泛应用于锂电池、包装、印刷、制品加工、纺织、轮胎橡胶、帘子布等行业；主要运用于精密数控设备、包装印刷设备、切模机、弯管机、经编机、机械手、自动贩卖机、电动平衡车、卫星信号接收传动设备、太阳能、风力发电设备、及精密自动化传动设备中，为客户产品提供可靠保障。

我们将秉承“诚实、努力、专业、共享”的企业精神，踏实奋进、勇于创新，不断提升研发、生产、销售与服务水平，把爱博科技打造成国际知名品牌。

Shenzhen Aibo Technology Co., Ltd was established in 2005, we are focus on smart guiding system, intelligent tension system, precision reducer as one of the high-tech enterprises. All the process follow the ISO9001 quality system.

With innovative ideas, we made patented technology, developed the smart coil control system, precision reducer series products, and got the government innovation fund.

We have a professional R & D team and invited high level skilled engineer from Japan to join us. Our components was offered by Japanese enterprise, the high precision parts supply make our quality to stay a high level. We can offer high precision, high quality precision gear, reducer and other precision transmission parts according to the needs of different customers.

Our products has been widely used in the industry of lithium battery, packaging, printing, paper products processing, textile, rubber, the tire cord, etc.; mainly used in machine precision CNC equipment, packaging and printing equipment, cutting machine, bending machine, warp knitting machine, robot, manipulator, vending, balance of electric cars, the satellite signal receiving transmission equipment, solar energy, wind power equipment, and precision automatic transmission equipment, for the customer to provide a reliable guarantee.

We will be adhering to the "honesty, hard work, professional, sharing" the spirit of enterprise, pragmatic progressive and innovative, constantly enhance the research and development, production, sales and service, make Aibo technology the international famous brand.

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PHF系列/PHN系列/PHR系列

PHF系列产品特点
PHF 单/双段外型尺寸图 /PHF 性能规格共表
PHN单/双段外型尺寸图/PHN 性能规格共表
PHR 单/双段外型尺寸图/PHR 性能规格共表

P
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PSF系列/PSR系列/PSN系列

PSF系列 产品特点
PSF单/双段外型尺寸图/PSF 性能规格共表
PSR单/双段外型尺寸图/PSR 性能规格共表
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PHZ系列/PSZ系列/PHA系列

PHZ系列产品特点
PHZ单/双段外型尺寸图/PHZ 性能规格共表
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P
35-50

非标产品展示

智能家居、智能卫浴类 办公用品、电动工具类 自动贩卖类 收银、ATM类
非标产品-22系列
非标产品-42系列

P
51-54

行星减速机背隙定义说明
行星减速机的基本构造

型号定义

CODING SYSTEM

P
|
代表行星式减速机

H
|
结构类型
H:精密斜齿轮结构
S:精密直齿轮结构

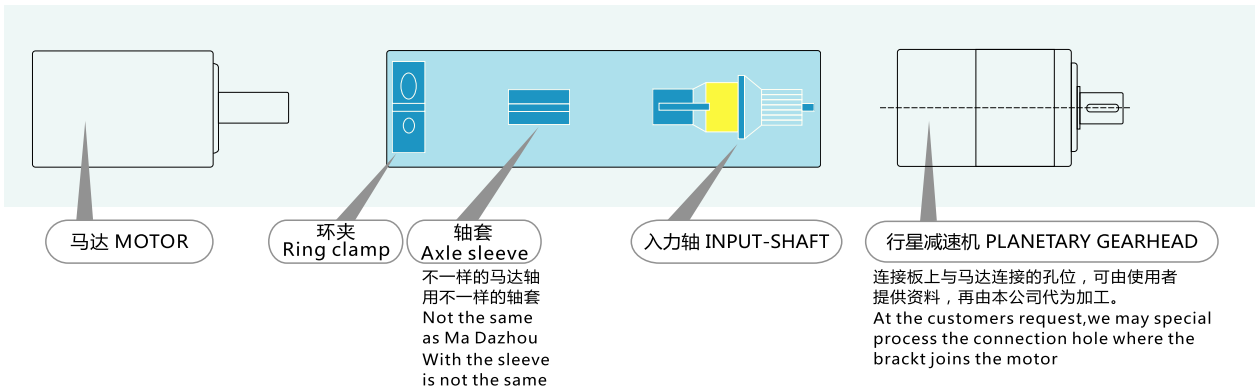
F
|
本体与连结方式
F:方形有法兰
R:圆形有法兰
N:圆形无法兰
Z:直角型
(该类型只做方形有法兰)
A:ABLE专用减速机
(VR减速机)

060
|
外观尺寸
042:□042
060:□060
090:□090
115:□115
142:□142
180:□180
220:□220

5
|
减速比
单段:
3,4,5,6,7,8,9,10
双段:
12,15,20,25,30,
35,40,45,50,60,
70,80,90,100
多段:
120~1000



马达与减速机组合方法 CONNECTION OF MOTOR GEARHEAD

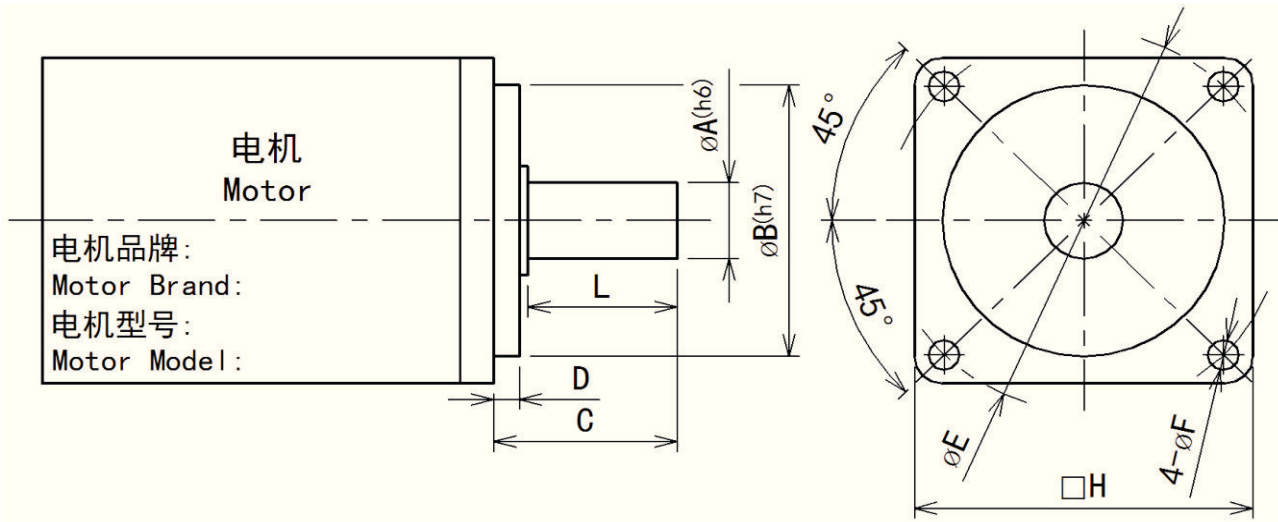


环夹、轴套、入力轴与马达稳固组合后，请谨慎与行星式减速机结合，以防止伤及减速机的内部结构。
Clip ring, shaft sleeve, the shaft are stably combined with the motor, please be careful with the planetary reducer with internal structure, in order to prevent injury and reducer.

在正常的使用状态下，本公司出厂的产品保固一年或20,000小时，以先到期为准。
Under normal usage and loading, our products come with a one-year or 20,000-hour limited warranty, whichever comes first.

客户填写资料

FILL IN DATA OF MOTOR



规格SPECIFICATIONS

Motor Shaft Dia.	Flange Dia.	Motor Shaft Length	Flange Height	P.C.D of Bore	Bore Dia.	Motor Flange Square	Actual Length of Motor Shaft	Backlash
马达轴外径	马达凸缘外径	马达轴长度	马达凸缘高度	螺丝孔中心距	螺丝孔直径	马达面尺寸	马达轴有效长	要求背隙精度
∅A (h6)	∅B (h7)	C	D	∅E	∅F	□H	L	P0/P1/P2

本公司生产行星式减速机皆经过专属配对加工，保证寿命超长并确保背隙精度不变，荣获国内外知名精密机械或半导体大厂选用，值得信赖。
Our production of planetary reducer is under the exclusive matching processing, ensuring long service life and the backlash precision, we have won the domestic and foreign well-known precision machinery or Semiconductor manufacturers choose, trustworthy.

行星减速机马达安装说明书

Planetary Gearbox with Motor Mounting Instructions

For General Type

1
先确认马达减速机规格是否正确，并将马达与减速机之安装面擦拭干净。
Check the motor and gear box size.Clean the mounting surface.



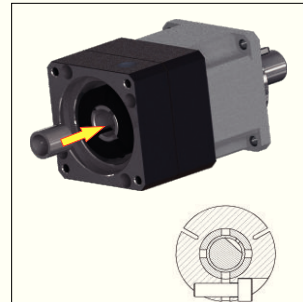
2
将减速机后盖上扣式塞头取下，转动马达环夹，直到锁紧环螺丝对准塞头孔。
Take off the plug from the bracket. Revolve the set collar until the bow is aligned with the hole.



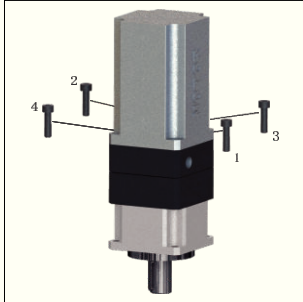
3
取下马达上原先的键，如有必要，请安装平衡键。
Remove the key from the shaft. Mounting the balance key if necessary.



4
确定马达轴心尺寸，轴心太小选用适当轴套。
Make sure the motor shaft size. Choose the appropriate sleeve if necessary.
当马达为平轴状，对准衬套夹缝在平轴中心线，使锁紧环螺丝与平轴面呈垂直。
As installing on flatted shaft, be sure to align the collet gap over the flat and the set collar bolt perpendicular to the flat.



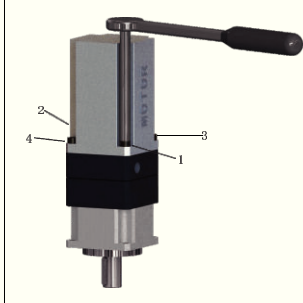
5
以螺丝扭力表（表一）建议扭力值的5%，依照1至4顺序将螺丝轻轻锁上。
Tighten the mounting in 1~4 order with torque wrench to 5%specified torque.(See Table 1)



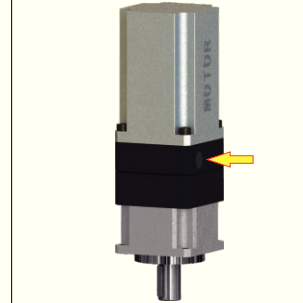
6
将马达与减速机直立摆设，参照螺丝扭力表(表二)建议之扭力值，以扭力扳手将减速机环夹螺丝锁紧。
Tighten the set collar bolt with toeque wrench to specified torque.(See Table 2)



7
以螺丝扭力表（表一）建议之扭力值，依照1至4顺序，用扭力扳手将螺丝锁紧。
Tighten the mounting in1~4 order with torque wrench to specified torque.(See Table 1)



8
将扣式塞头装回。
Put the plug back on the adapter plate.



行星减速机/马达安装锁紧扭力表(参照)

Table of Tightening Torque for Planetary Reducer/Motor(Reference)

表一：与马达组合锁紧螺丝扭力建议表 Table 1 of tightening torque recommended for motor mounting bolt.

螺丝尺寸 Screw size	六角头尺寸 Six hexagon head size	强度8.8螺丝之锁紧扭力 Strength of 8.8 screw locking torque		强度10.9螺丝之锁紧扭力 Strength of 10.9 screw locking torque		强度12.9螺丝之锁紧扭力 Strength of 12.9 screw tightening torque	
	mm	N-m	In-lbs	N-m	In-lbs	N-m	In-lbs
M3*0.5P	2.5	1.3	12	1.8	16	2.1	19
M4*0.7P	3	3	27	4.1	37	4.9	44
M5*0.8P	4	6.1	55	8.2	73	9.8	87
M6*1.0P	5	11	98	14	124	17	151
M8*1.25P	6	25	222	34	302	41	364
M10*1.5P	8	49	434	67	594	80	709
M12*1.75P	10	85	753	116	1028	139	1232
M14*2.0P	12	137	1214	186	1648	223	1976
M16*2.0P	14	210	1860	286	2534	343	3038

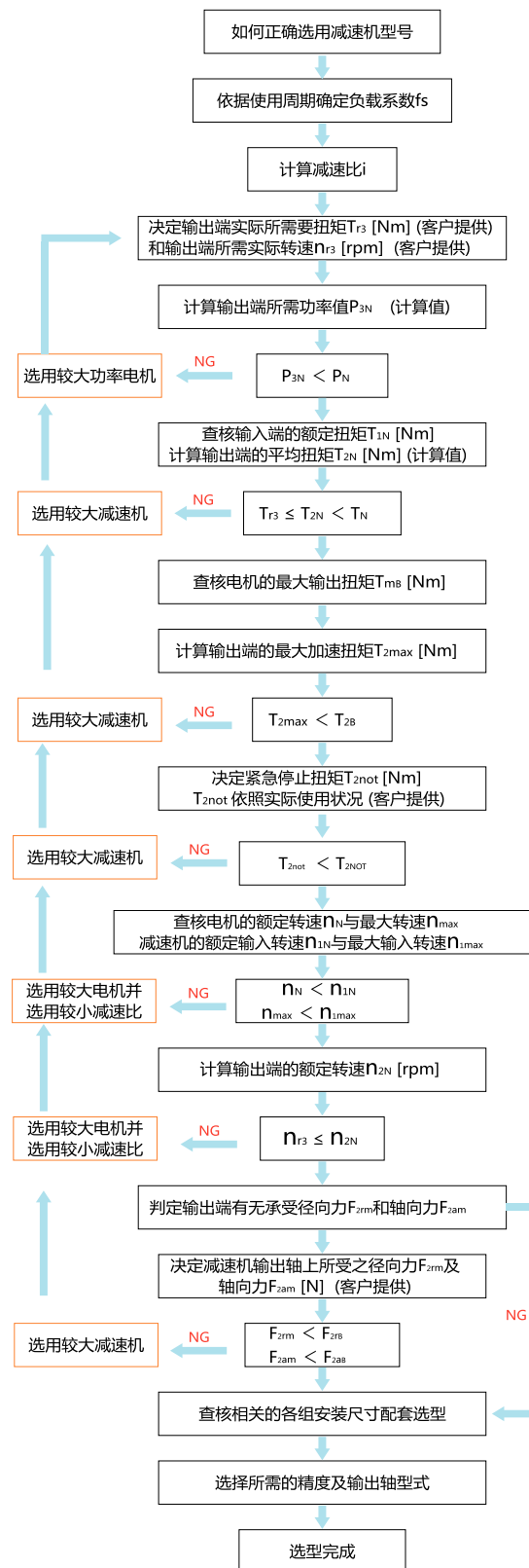
表二：马达出力轴锁紧环夹螺丝扭力建议表 Table 2 of tightening torque recommended for set collar bolt.

减速机型号(例) Reducer type (cases)	马达轴径 The motor shaft diameter	螺丝尺寸规格 Screw size	六角头尺寸 Six hexagon head size	锁紧扭力 Tightening torque	
	mm		mm	N-m	In-lbs
PSZ42/PSF42/PSR50/PSN50	≤8	M3*0.5P	2.5	2.1	19
PHZ42/PHF42/PHR50/PHN50	≤8	M3*0.5P	2.5	2.1	19
PSZ60/PSF60/PSR70/PSN70	≤14	M4*0.7P	3	4.9	44
PHZ60/PHF60/PHR70/PHN70	≤14	M4*0.7P	3	4.9	44
PSZ90/PSF90/PSR90/PSN90	≤24	M6*1.0P	5	9.8	87
PHZ90/PHF90/PHR90/PHN90	≤24	M6*1.0P	5	9.8	87
PSZ115/PSF115/PSR120/PSN120	≤28	M8*1.25P	6	25	222
PHZ115/PHF115/PHR120/PHN120	≤28	M8*1.25P	6	25	222
PSZ142/PSF142/PSR142/PSN155	≤35	M10*1.5P	8	49	434
PHZ142/PHF142/PHR142/PHN155	≤35	M10*1.5P	8	49	434
PSF180/PSR180/PSN205	≤50	M12*1.75P	10	85	753
PHF180/PHR180/PHN205	≤50	M12*1.75P	10	85	753
PSF220/PSR220/PSN235	≤55	M14*2.0P	12	137	1214
PHF220/PHR220/PHN235	≤55	M14*2.0P	12	137	1214

注1：螺丝锁紧扭力必须大于上述值。若有必要时，可以将锁紧扭力多增加上述建议值的20%，以避免打滑。
Note1:Holding torques must be bigger than values shown above.Bolts can be tightened up to 20% higher for increased holding.

减速机的选型方法（参考）

Selection method of speed reducer (Reference)



$$1. i = \frac{n_N}{n_{r3}}$$

n_N : Motor rated speed (the rated speed input) [rpm]
 n_{r3} : The output end of the actual needs of the speed [rpm]

$$2. P_{3N} = \frac{T_{r3} \times n_{r3}}{9550 \times \eta}$$

T_{r3} : 输出端实际所需要的扭矩 [Nm]
 n_{r3} : 输出端所需实际转速 [rpm]
 η : 减速机传动效率 [%]
 P_{3N} : 输出端实际所需的功率 [KW]
 P_N : 电机输出的额定功率 [KW]

$$3. T_{2N} = T_{1N} \times i \times \eta$$

T_{2N} : 输出端平均扭矩 [Nm]
 T_{1N} : 输入端额定扭矩 (电机额定输出扭矩) [Nm]
 η : 减速机运转效率 [%]
 T_N : 减速机额定输出扭矩 [Nm]

$$4. T_{2max} = T_{mB} \times i \times fs \times \eta$$

fs : 负载系数

负载系数 (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

$$T_{2max}$$
: 输出端的最大加速扭矩 [Nm]
 T_{mB} : 电机的最大输出扭矩 [Nm]
 T_{2B} : 减速机的最大加速扭矩 [Nm]

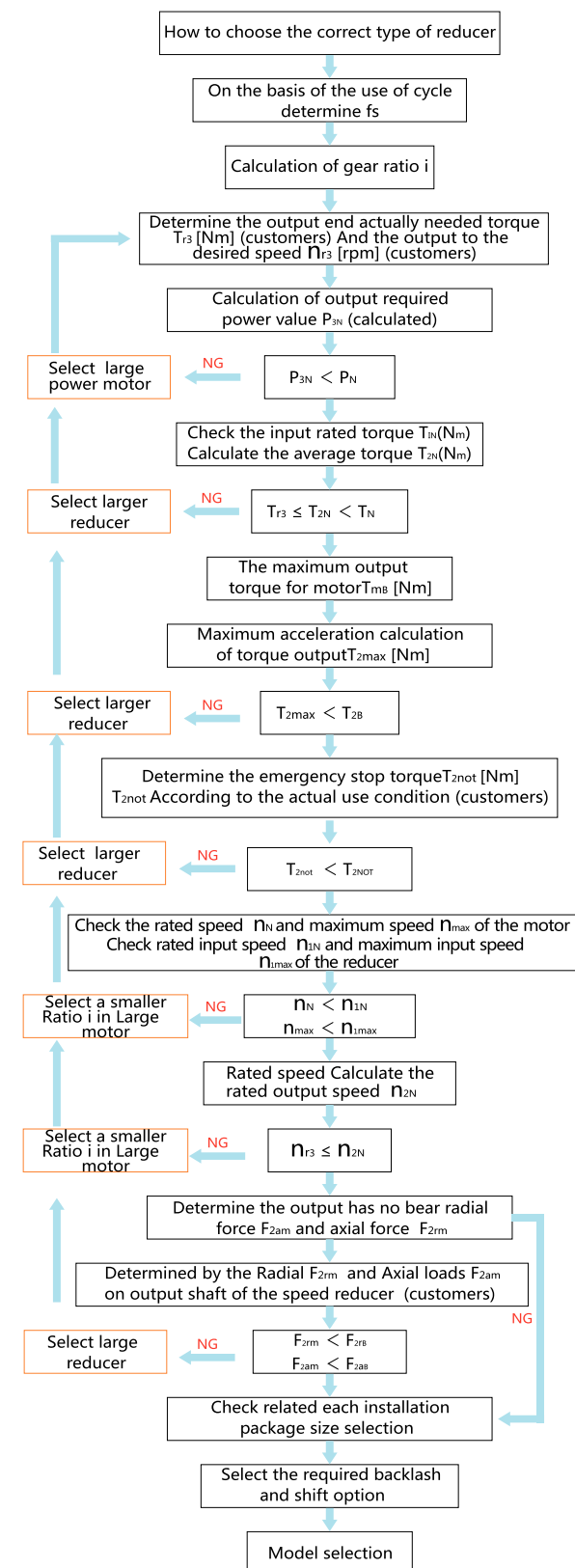
$$5. T_{2not}$$
: 输出端所需的紧急停止扭矩 [Nm]
 T_{2NOT} : 减速机所能承受的紧急停止扭矩 [Nm]

$$6. n_{max}$$
: 电机的最大转速 [rpm]
 n_{1N} : 减速机的额定输入转速 [rpm]
 n_{1max} : 减速机所允许的最大输入转速 [rpm]

$$7. n_{2N} = \frac{n_N}{i}$$

n_{2N} : 输出端的额定转速 [rpm]

$$8. F_{2rm}$$
: 减速机的输出轴上实际承受的径向力
 F_{2am} : 减速机的输出轴上实际承受的轴向力
 F_{2rB} : 减速机的输出轴上所能承受的径向力
 F_{2aB} : 减速机的输出轴上所能承受的轴向力
 ※其中输出端与输入端是相对于减速机的输入与输出



$$1. i = \frac{n_N}{n_{r3}}$$

n_N : Motor rated speed (the rated speed input) [rpm]
 n_{r3} : The output end of the actual needs of the speed [rpm]

$$2. P_{3N} = \frac{T_{r3} \times n_{r3}}{9550 \times \eta}$$

T_{r3} : The output end of the actual needs of the torque [Nm]
 n_{r3} : The output end of the needs of the actual speed [rpm]
 η : Reducer transmission efficiency [%]
 P_{3N} : The power output of actual required [KW]
 P_N : Rated output power of the motor [KW]

$$3. T_{2N} = T_{1N} \times i \times \eta$$

T_{2N} : The output end of the average torque [Nm]
 T_{1N} : Input rated torque (rated output torque motor) [Nm]
 η : Reducer operating efficiency [%]
 T_N : Rated output torque of reducer [Nm]

$$4. T_{2max} = T_{mB} \times i \times fs \times \eta$$

fs : Load factor

Load factor (fs)						
The type of load	Every hour starting times Z	The daily running time (h)				
		h < 4	4 < h < 8	8 < h < 12	12 < h < 16	16 < h < 24
Uniform load	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
Secondary load	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
Heavy load	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

$$T_{2max}$$
: Maximum acceleration torque output of the [Nm]
 T_{mB} : The maximum output torque of motor [Nm]
 T_{2B} : maximum acceleration torque of educer [Nm]

$$5. T_{2not}$$
: Emergency stop torque output to the desired [Nm]
 T_{2NOT} : Emergency stop torque reducer can bear [Nm]

$$6. n_{max}$$
: The maximum speed of the motor [rpm]
 n_{1N} : Rated input speed of the reducer [rpm]
 n_{1max} : The maximum allowed input speed of the reducer [rpm]

$$7. n_{2N} = \frac{n_N}{i}$$

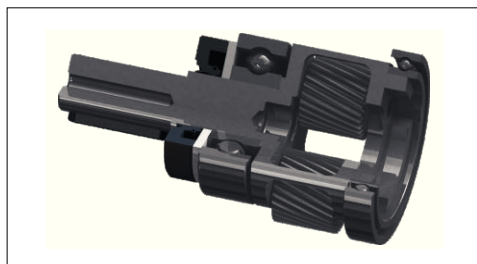
n_{2N} : Rated speed output [rpm]

$$8. F_{2rm}$$
: Radial force of the output shaft of the reducer actual bear
 F_{2am} : The axial force of the output shaft of the reducer actual bear
 F_{2rB} : Radial force of the output shaft of the reducer can bear
 F_{2aB} : Axial force on output shaft of the reducer can bear

※The output end and the input end is relative to the input and output speed reducer

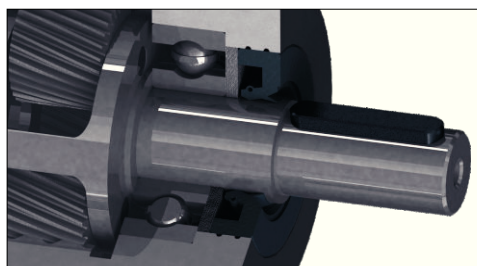
PHF系列 产品特点

PHF SERIES FEATURES



行星固定架及出力轴设计一体成型，且前后培林设定位置为大跨距，可达到最大扭转刚性及出力轴高径向负载能力。

Planetary arm bracket and output shaft are one-piece constructed, setting bearing apart for larger span to reach the largest reverse rigid and contribute high axis radial load capacity.



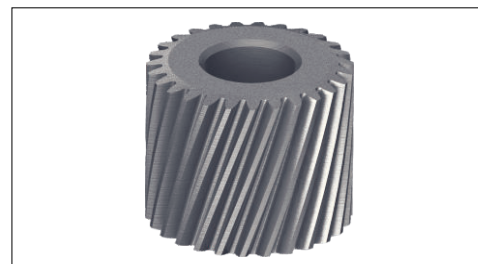
出力轴表面为研磨光面处理Ra 0.2μm。与油封搭配确保最低摩擦系数相对减少启动负载，保持最佳密封性，延长使用寿命。

Grinding process Ra 0.2μm to smooth surface of output shaft, and with oil-seal to minimum friction coefficient and reducing start up load; result in the best seal-ability and extended lifespan.



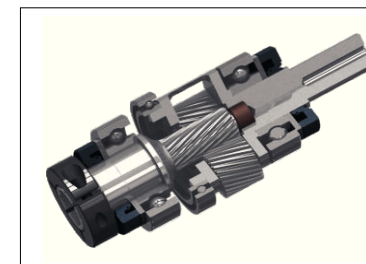
本体独家采用最新高科技材料，齿箱与内环齿一体锻造成形，再经日本三菱顶级插齿机加工。具有高精密度，高扭力，耐磨耗等特点。先进无电解镍表面处理，耐刮，耐腐蚀，最适合高科技设备严苛要求。

RD use exclusively the latest high-tech materials. The gear box and internal gear are one-piece constructed, and then processed with Mitsubishi Japan gear shaper machinery for high-precision, high torque and abrasion consumption. Advanced electroless nickel surface treatment, scratch resistance, corrosion resistance, are the most suitable for strict requirements of the high-tech equipment.



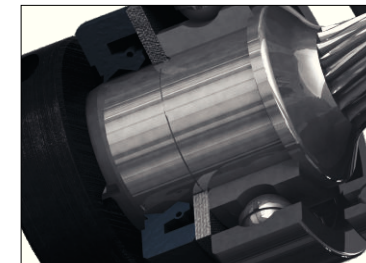
齿轮材质选用高级合金钢，独特真空渗碳及热处理至最佳硬度，兼具表面硬度及心部韧性，并经过齿型研磨加工，以获得最佳的精度、高耐磨耗及高耐冲击韧性。

Alloy steel gear with unique vacuum carburizing and heat treatment for the best surface hardness and inner core tenacity. Additionally, with gear grinding processing to get the best accuracy high wear resistance and high impact toughness.



太阳齿前端轴承直接置入于行星固定架内，整体机械结构设计，以确保传动元件的同心度及运转平稳性。

The sun pinion front bearing is directly arranged in the fixed frame the whole planet. Mechanical structure design, in order to ensure the concentric drive element and the operation stability.

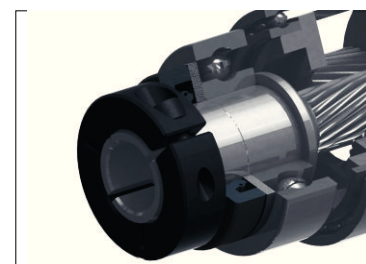


采用与世界知名品牌同款润滑油，搭配高科技油封设计，上唇为防尘唇，下唇为防油唇。采IP65防护等级的密封设计，不泄漏、永久免保养。

High-tech oil seal design on the upper lip guard against dust intruder, lower lip to guard against oil leak. Protection grade Ip65 safeguards fully avoid leaking problem, and given it maintenance-free.

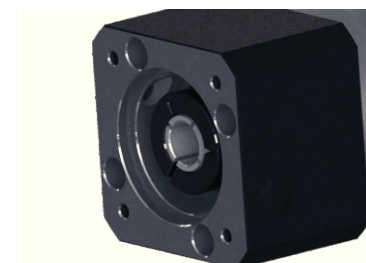
PHF系列采用螺旋齿轮设计，提升齿形契合率达30%以上，特殊螺旋角设计，可降低径向推力、容许伺服马达高转速的输入，达到最大扭力输出。精密齿轮设计及专业齿轮加工，制造出低运转背隙、高效率、运转平顺、低噪音及长寿命的行星减速机。

PHF series helical gear design, enhance tooth engagement rate of 30% or more, special helix design, which reduces the axial thrust, allowing high speed servo motor input, maximum torque output. Precision gear design and professional gear processing create a low backlash operation, high efficiency, smooth running, low noise and long life of the planetary gear.



输入端与马达入力轴连接方法采用栓紧式机构，锁紧环经过动平衡分析，确保高转速下，结合界面的同心度及零滑差动力传递。

Input-end and motor shaft are combined through a dynamic balanced collar clamping to ensure connection interface concentricity and zero slip power transmission at high speed.



先进马达连接板设计，配合轴套，安装容易，可与各种厂牌之伺服、步进马达完美搭配组合。

Advanced motor connecting plate design are combined with the shaft sleeve, installation Easily, with various brands of servo or stepper motor.



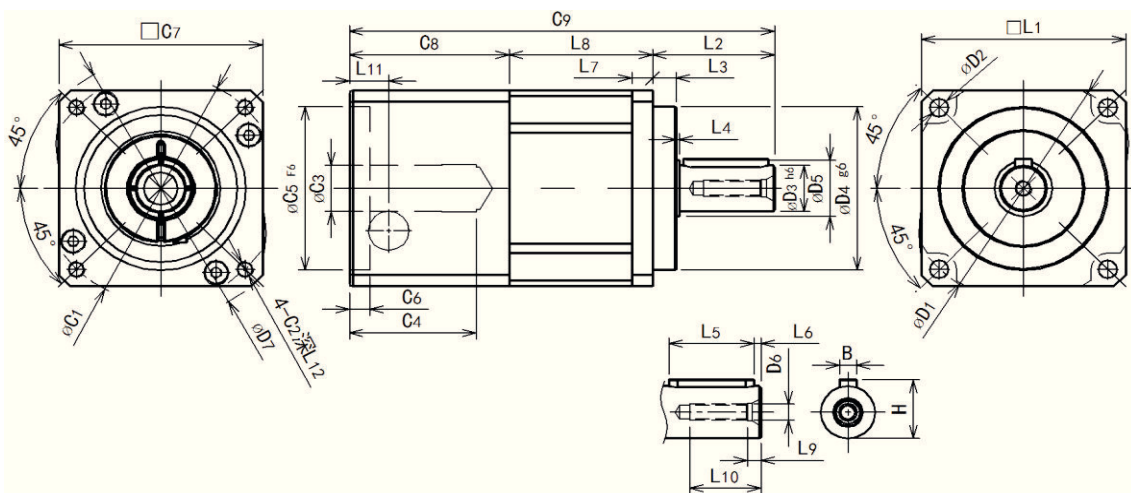
行星齿轮传动界面采用滚针轴承，以达到最大输出扭矩和最小间隙公差，提高结构钢性及转动的平稳性。

Interface of planetary gear transmission are equipped with a needle bearing, in order to achieve the maximum output torque and the minimum gap tolerance, improve the structure of steel and rotational stability.

产品因人为原因或天灾等因素导致不良或损坏，不在保固范围内。

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

PHF 单段外型尺寸图 PHF Single Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PHF42	PHF60	PHF90	PHF115	PHF142	PHF180	PHF220
D1	50	70	100	130	165	215	250
D2	3.4	5.5	6.5	8.5	10.5	13	17
D3 _{h6}	13	16	22	32	40	55	75
D4 _{g6}	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P	M20×2.5P	M20×2.5P
D7	56	80	118	148	186	239	292
L1	42.6	60	90	115	142	182	220
L2	26	37	48	62	93	104.5	138
L3	5.5	7	10	8	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	4	6	8	12	18	16	20
L8	28.3	36	46	59	79	87.5	117.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	9.5	11	14.5	21	17	25.5	27.8
L12	15	20	25	30	35	35	40
C1 ²	46	70	90	115	145	200	235
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M12×1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	37	47	58	66	82	98
C5 ² F ₆	30	50	70	95	110	114.3	200
C6 ²	4	4	6	10	6	13	12
C7 ²	42.6	60	90	115	140	182	220
C8 ²	38.5	46	55	63	80	95	130
C9 ²	92.8	119	149	184	252	287	385.5
B	5	5	6	10	12	16	20
H	15	18	24.5	35	43	59	79.5

※C1 ~ C9是公制标准马达连接板尺寸, 请依所选用的马达决定。

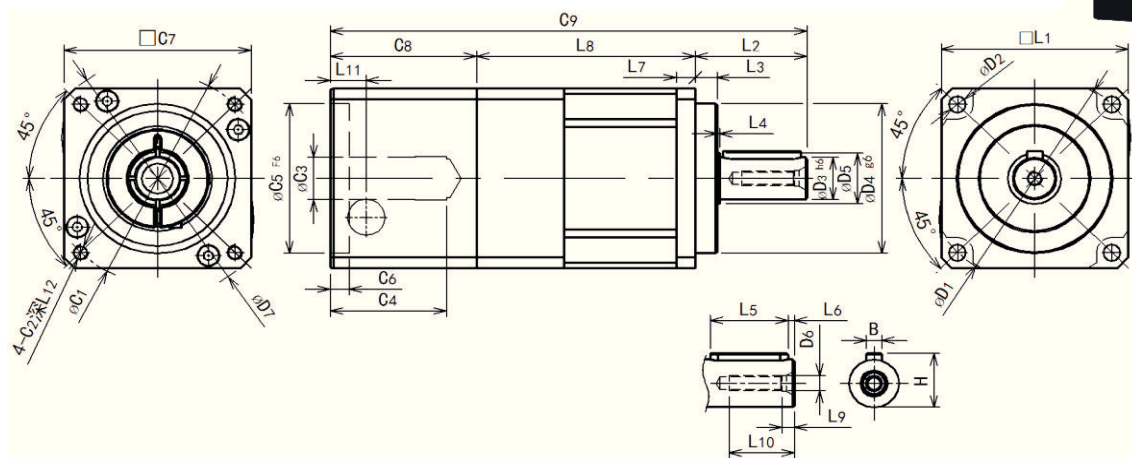
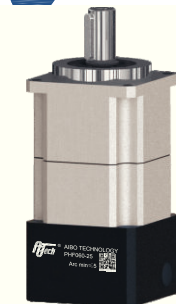
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※C1 ~ C9 are motor specitic dimensions(metric std shown).

Size may vary according to motor flange chosen.

※Specification subject to change without notice.

PHF 双段外型尺寸图 PHF Double Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PHF42	PHF60	PHF90	PHF115	PHF142	PHF180	PHF220
D1	50	70	100	130	165	215	250
D2	3.4	5.5	6.5	8.5	10.5	13	17
D3 _{h6}	13	16	22	32	40	55	75
D4 _{g6}	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P	M20×2.5P	M20×2.5P
D7	56	80	118	148	186	239	292
L1	42.6	60	90	115	142	182	220
L2	26	37	48	62	93	104.5	138
L3	5.5	7	10	8	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	4	6	8	12	18	16	20
L8	54.3	64	86	107	140	177.5	232
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	9.5	11	14.5	21	17	25.5	27.8
L12	15	20	25	30	35	35	40
C1 ²	46	70	90	115	145	200	235
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M12×1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	37	47	58	66	82	98
C5 ² F ₆	30	50	70	95	110	114.3	200
C6 ²	4	4	6	10	6	13	12
C7 ²	42.6	60	90	115	140	182	220
C8 ²	38.5	46	55	63	80	95	130
C9 ²	118.8	147	189	232	313	377	500
B	5	5	6	10	12	16	20
H	15	18	24.5	35	43	59	79.5

※C1 ~ C9是公制标准马达连接板尺寸, 请依所选用的马达决定。

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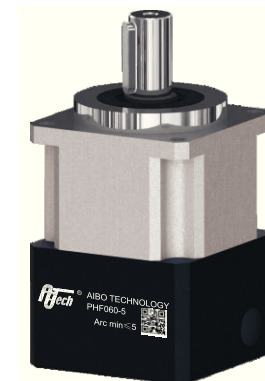
Size may vary according to motor flange chosen.

※Specification subject to change without notice.

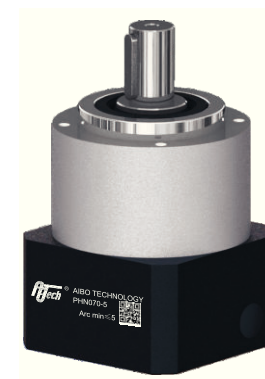
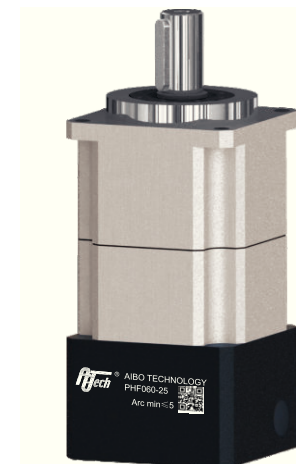
PHF 性能规格共表 Specifications Table

规格 Specifications			减速比 Ratio	PHF-42	PHF-60	PHF-90	PHF-115	PHF-142	PHF-180	PHF-220	
额定输出力矩 T_{2N} Nominal Output Torque	N·m	1	3	19	53	145	290	520	950	1550	
			4	20	55	150	300	550	1000	1650	
			5	17	54	140	290	530	1050	1700	
			6	15	46	135	280	490	1000	1600	
			7	14	44	125	270	450	960	1500	
			8	12	41	110	240	390	900	1350	
			9	11	37	95	220	360	800	1250	
		2	10	11	37	95	220	360	800	1250	
			节数 Stage	减速比 Ratio	PHF-42	PHF-60	PHF-90	PHF-115	PHF-142	PHF-180	PHF-220
			15	19	53	145	290	520	950	1550	
			20	20	55	150	300	550	1000	1650	
			25	17	54	140	290	530	1050	1700	
			30	17	54	140	290	530	1050	1700	
			35	17	54	140	290	530	1050	1700	
			40	17	54	140	290	530	1050	1700	
			45	17	54	140	290	530	1050	1700	
			50	17	54	140	290	530	1050	1700	
			60	15	46	135	280	490	1000	1600	
70	14	44	125	270	450	960	1500				
80	12	41	110	240	390	900	1350				
90	11	37	95	220	360	800	1250				
100	11	37	95	220	360	800	1250				
急停力矩 T_{2NOT} Emergency Stop Torque	N·m	3.0倍额定输出力矩 (3.0 times of Nominal Output Torque) (*最大输出力矩 Max.Output Torque T_{2B} =60% of Emergency Stop Torque)									
额定输入转速 n_{1N} Nominal Input Speed	rpm	1.2	3-100	5000	5000	4000	4000	3000	3000	2000	
最大输入转速 n_{1max} Max.Input Speed	rpm	1.2	3-100	10000	10000	8000	8000	6000	6000	4000	
超精密背隙 Ultraprecise Backlash P_0	arcmin	1	3-10	≤2	≤2	≤2	≤1	≤1	≤1	≤1	
精密背隙 Precise Backlash P_1	arcmin	2	12-100	≤4	≤4	≤4	≤3	≤3	≤3	≤3	
		1	3-10	≤4	≤4	≤4	≤3	≤3	≤3	≤3	
标准背隙 Standard Backlash P_2	arcmin	2	12-100	≤6	≤6	≤6	≤5	≤5	≤5	≤5	
		1	3-10	≤6	≤6	≤6	≤5	≤5	≤5	≤5	
扭转刚性 Torsional Rigidity	N·m /arcmin	2	12-100	≤8	≤8	≤8	≤7	≤7	≤7	≤7	
		1	3-10	≤8	≤8	≤8	≤7	≤7	≤7	≤7	
①容许径向力 F_{2rB} Max.Radial Load	N	1.2	3-100	515	1010	1780	3420	5380	8330	11120	
①容许轴向力 F_{2aB} Max.Axial Load	N	1.2	3-100	410	600	1500	2650	4670	6460	8560	
使用温度 Operating Temp.	℃		3-100	-10℃ ~ +90℃							
使用寿命 Service Life	hr		3-100	20,000(10,000/连续运转 Continuous operation)							
效率 Efficiency	%	1	3-10	≥97%							
		2	12-100	≥94%							
重量 Weight	kg	1	3-10	0.6	1.3	3.5	7.8	16.1	27	58	
		2	12-100	0.9	2.0	5.6	9.5	19	34	65	
安装方向 Mounting Position	-	1.2	3-100	任意方向 Any direction							
②噪音值 Noise Level	dB(A)/1m	1.2	3-100	56	58	60	63	65	67	70	
防护等级 Protection Class	-	1.2	3-100	Ip65							
润滑 Lubrication	-	1.2	3-100	全合成润滑油脂 Synthetic Lubricant							
减速机转动惯量 Inertia (J1)											
节数 Stage	减速比 Ratio	单位 unit	PHF-42	PHF-60	PHF-90	PHF-115	PHF-142	PHF-180	PHF-220		
1	3	kg.cm²	0.03	0.23	0.97	2.35	10.00	30.50	79.50		
	4		0.02	0.18	0.67	1.66	7.17	25.86	58.21		
	5		0.02	0.17	0.65	1.50	6.52	23.63	54.36		
	6/7/8		0.02	0.14	0.60	1.45	6.17	22.92	54.12		
	9/10		0.02	0.14	0.58	1.41	6.10	22.73	53.98		
节数 Stage	减速比 Ratio		PHF-42	PHF-60	PHF-90	PHF-115	PHF-142	PHF-180	PHF-220		
2	15/20/25		0.02	0.17	0.65	0.65	1.50	6.52	23.63		
	30/35/40		0.02	0.14	0.60	0.60	1.45	6.17	22.92		
	45/50/70/80/90/100		0.02	0.14	0.58	0.58	1.41	6.10	22.73		
①输出转速100rpm时，作用于输出轴中心位置 Applied to the output shaft center@100rpm. ②3000rpm空载量测Measured at 3000rpm with no load.											
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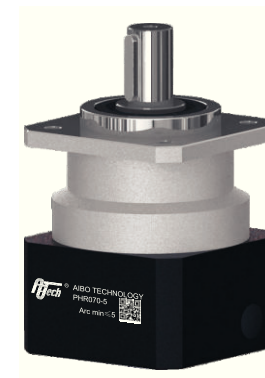
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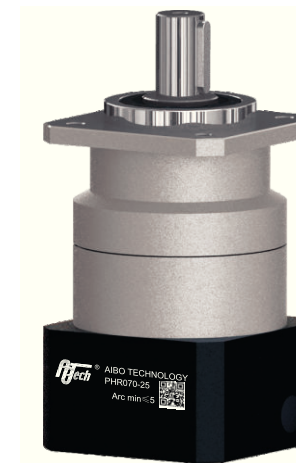
PHF



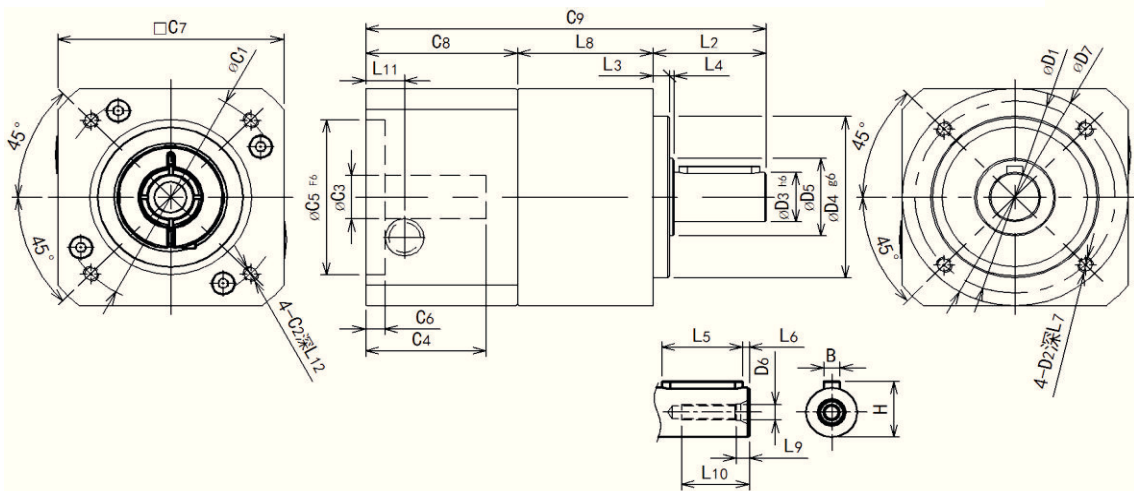
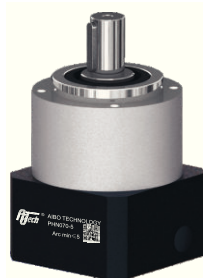
PHN



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PHN 单段外型尺寸图 PHN Single Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PHN50	PHN70	PHN90	PHN120	PHN155	PHN205	PHN235
D1	44	62	80	108	140	184	210
D2	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M16×2.0P
D3 _{h6}	13	16	22	32	40	55	75
D4 _{g6}	35	52	68	90	120	160	180
D5	15	25	35	45	50	70	90
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P	M20×2.5P	M20×2.5P
D7	50	70	94	120	155	205	235
L2	24.5	35	48	60	93	99.5	126
L3	4	5	10	6	8	15	18
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	8	10	10	15	18	21	32
L8	30	38	46	61	79	92.5	129.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	9.6	11	13.5	21	17	25.5	27.8
L12	15	20	25	30	35	35	40
C1 ²	46	70	90	115	145	200	235
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M12×1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	35	43	58	66	82	98
C5 ^{2F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	34	44	50	63	80	95	130
C9 ²	88.5	117	144	184	252	287	385.5
B	5	5	6	10	12	16	20
H	15	18	24.5	35	43	59	79.5

※C1 ~ C9是公制标准马达连接板尺寸，请依所选用的马达决定。

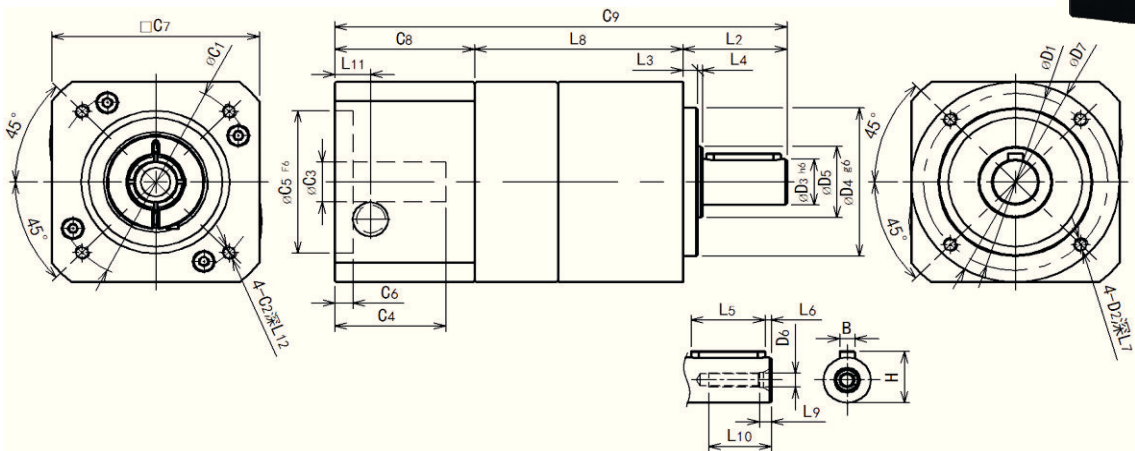
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※C1 ~ C9 are motor specific dimensions(metric std shown).

Size may vary according to motor flange chosen.

※Specification subject to change without notice.

PHN 双段外型尺寸图 PHN Double Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PHN50	PHN70	PHN90	PHN120	PHN155	PHN205	PHN235
D1	44	62	80	108	140	184	210
D2	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M16×2.0P
D3 _{h6}	13	16	22	32	40	55	75
D4 _{g6}	35	52	68	90	120	160	180
D5	15	25	35	45	50	70	90
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P	M20×2.5P	M20×2.5P
D7	50	70	94	120	155	205	235
L2	24.5	35	48	60	93	99.5	126
L3	4	5	10	6	8	15	18
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	8	10	10	15	18	21	32
L8	56	66	86	109	140	182.5	244
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	9.6	11	13.5	21	17	25.5	27.8
L12	15	20	25	30	35	35	40
C1 ²	46	70	90	115	145	200	235
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M12×1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	35	43	58	66	82	98
C5 ^{2F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	34	44	50	63	80	95	130
C9 ²	114.5	145	184	232	313	377	500
B	5	5	6	10	12	16	20
H	15	18	24.5	35	43	59	79.5

※C1 ~ C9是公制标准马达连接板尺寸，请依所选用的马达决定。

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※C1 ~ C9 are motor specific dimensions(metric std shown).

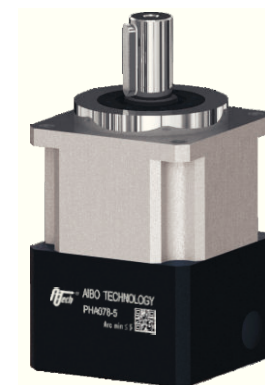
Size may vary according to motor flange chosen.

※Specification subject to change without notice.

PHN 性能规格共表 Specifications Table

规格 Specifications			节数 Stage	减速比 Ratio	PHN-50	PHN-70	PHN-90	PHN-120	PHN-155	PHN-205	PHN-235	
额定输出力矩 T_{2N} Nominal Output Torque		N·m	1	3	19	53	145	290	520	950	1550	
				4	20	55	150	300	550	1000	1650	
				5	17	54	140	290	530	1050	1700	
				6	15	46	135	280	490	1000	1600	
				7	14	44	125	270	450	960	1500	
				8	12	41	110	240	390	900	1350	
				9	11	37	95	220	360	800	1250	
			10	11	37	95	220	360	800	1250		
			2	15	19	53	145	290	520	950	1550	
				20	20	55	150	300	550	1000	1650	
				25	17	54	140	290	530	1050	1700	
				30	17	54	140	290	530	1050	1700	
				35	17	54	140	290	530	1050	1700	
				40	17	54	140	290	530	1050	1700	
		45		17	54	140	290	530	1050	1700		
		50	17	54	140	290	530	1050	1700			
		60	15	46	135	280	490	1000	1600			
		70	14	44	125	270	450	960	1500			
		80	12	41	110	240	390	900	1350			
		90	11	37	95	220	360	800	1250			
		100	11	37	95	220	360	800	1250			
急停力矩 T_{2NOT} Emergency Stop Torque	N·m	3.0倍额定输出力矩 (3.0 times of Nominal Output Torque) (*最大输出力矩 Max.Output Torque T_{2B} =60% of Emergency Stop Torque)										
额定输入转速 n_{1N} Nominal Input Speed	rpm	1.2	3-100	5000	5000	4000	4000	3000	3000	2000		
最大输入转速 n_{1max} Max.Input Speed	rpm	1.2	3-100	10000	10000	8000	8000	6000	6000	4000		
超精密背隙 Ultraprecise Backlash P_0	arcmin	1	3-10	≤2	≤2	≤2	≤1	≤1	≤1	≤1		
		2	12-100	≤4	≤4	≤4	≤3	≤3	≤3	≤3		
精密背隙 Precise Backlash P_1	arcmin	1	3-10	≤4	≤4	≤4	≤3	≤3	≤3	≤3		
		2	12-100	≤6	≤6	≤6	≤5	≤5	≤5	≤5		
标准背隙 Standard Backlash P_2	arcmin	1	3-10	≤6	≤6	≤6	≤5	≤5	≤5	≤5		
		2	12-100	≤8	≤8	≤8	≤7	≤7	≤7	≤7		
扭转刚性 Torsional Rigidity	N·m /arcmin	1.2	3-100	2.5	6	12	23	45	75	130		
①容许径向力 F_{2rB} Max.Radial Load	N	1.2	3-100	515	1010	1780	3420	5380	8330	11120		
①容许轴向力 F_{2aB} Max.Axial Load	N	1.2	3-100	410	600	1500	2650	4670	6460	8560		
使用温度 Operating Temp.	℃		3-100	-10℃ ~ +90℃								
使用寿命 Service Life	hr		3-100	20,000(10,000/连续运转 Continuous operation)								
效率 Efficiency	%	1	3-10	≥97%								
		2	12-100	≥94%								
重量 Weight	kg	1	3-10	0.6	1.3	3.5	7.8	16.1	27	58		
		2	12-100	0.9	2.0	5.6	9.5	19	34	65		
安装方向 Mounting Position	-	1.2	3-100	任意方向 Any direction								
②噪音值 Noise Level	dB(A)/1m	1.2	3-100	56	58	60	63	65	67	70		
防护等级 Protection Class	-	1.2	3-100	Ip65								
润滑 Lubrication	-	1.2	3-100	全合成润滑油脂 Synthetic Lubricant								
减速机转动惯量 Inertia (J1)												
节数 Stage	减速比 Ratio	单位 unit		PHN-50	PHN-70	PHN-90	PHN-120	PHN-155	PHN-205	PHN-235		
1	3	kg.cm²		0.03	0.23	0.97	2.35	10.00	30.50	79.50		
	4			0.02	0.18	0.67	1.66	7.17	25.86	58.21		
	5			0.02	0.17	0.65	1.50	6.52	23.63	54.36		
	6/7/8			0.02	0.14	0.60	1.45	6.17	22.92	54.12		
	9/10			0.02	0.14	0.58	1.41	6.10	22.73	53.98		
2	15/20/25			0.02	0.17	0.65	0.65	1.50	6.52	23.63		
	30/35/40			0.02	0.14	0.60	0.60	1.45	6.17	22.92		
	45/50/70/80/90/100			0.02	0.14	0.58	0.58	1.41	6.10	22.73		
①输出转速100rpm时，作用于输出轴中心位置 Applied to the output shaft center@100rpm. ②3000rpm空载量测Measured at 3000rpm with no load.												
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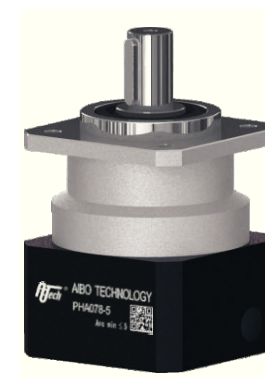
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PHF



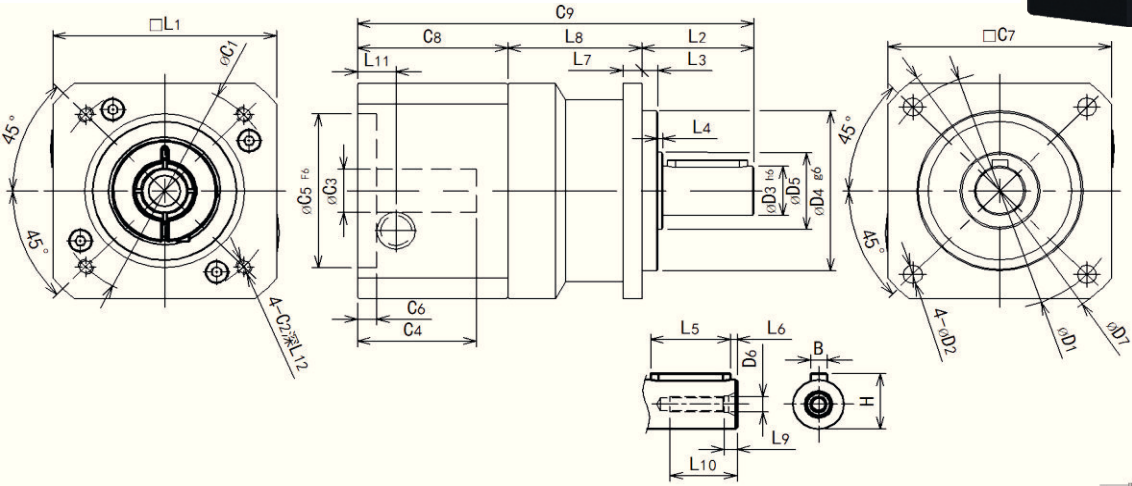
PHN



PHR



PHR 单段外型尺寸图 PHR Single Stage Dimensions



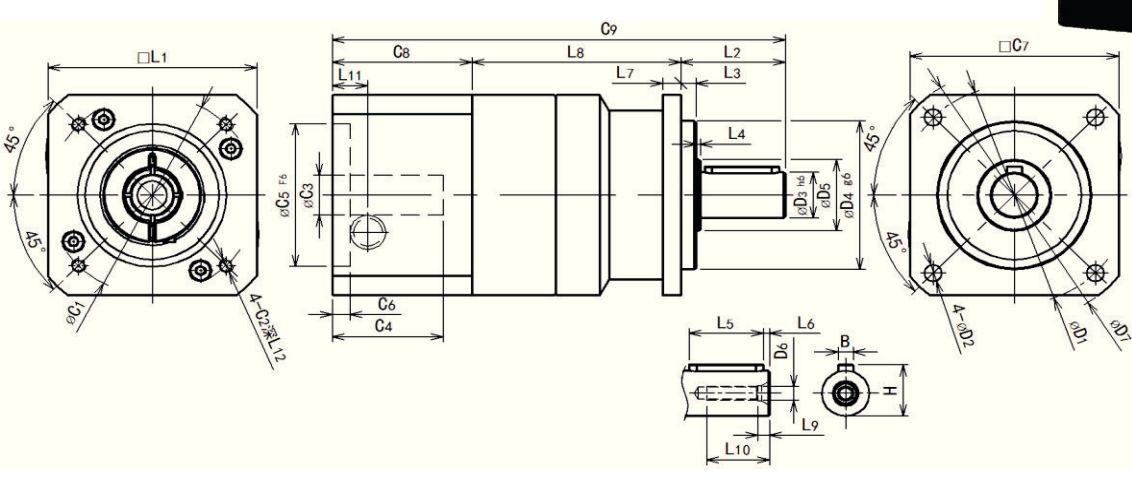
规格 (Specifications) : Unit : mm

尺寸 Dimensions	PHR50	PHR70	PHR90	PHR120	PHR142	PHR180	PHR220
D1	50	70	100	130	165	215	250
D2	3.4	6	6.5	8.5	10.5	13	17
D3 _{h6}	13	16	22	32	40	55	75
D4 _{g6}	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P	M20×2.5P	M20×2.5P
D7	64	90	120	152	186	239	292
L1	50	70	94	120	142	182	220
L2	24.5	37	43	60	93	104.5	138
L3	4	7	5	6	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	5	6	10	12	18	16	20
L8	30	36	51	61	79	87.5	117.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	9.6	11	13.5	21	17	25.5	27.8
L12	15	20	25	30	35	35	40
C1 ²	46	70	90	115	145	200	235
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M12×1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	35	43	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	34	44	50	63	80	95	130
C9 ²	88.5	117	144	184	252	287	385.5
B	5	5	6	10	12	16	20
H	15	18	24.5	35	43	59	79.5

※C1 ~ C9是公制标准马达连接板尺寸，请依所选用的马达决定。
 ※C1 ~ C9 are motor specitc dimensions(metric std shown).
 Size may vary according to motor flange chosen.
 ※Specification subject to change without notice.

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PHR 双段外型尺寸图 PHR Double Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PHR50	PHR70	PHR90	PHR120	PHR142	PHR180	PHR220
D1	50	70	100	130	165	215	250
D2	3.4	6	6.5	8.5	10.5	13	17
D3 _{h6}	13	16	22	32	40	55	75
D4 _{g6}	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P	M20×2.5P	M20×2.5P
D7	64	90	120	152	186	239	292
L1	50	70	94	120	142	182	220
L2	24.5	37	43	60	93	104.5	138
L3	4	7	5	6	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	4	6	10	12	18	16	20
L8	56	64	91	109	140	177.5	232
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	9.6	11	13.5	21	17	25.5	27.8
L12	15	20	25	30	35	35	40
C1 ²	46	70	90	115	145	200	235
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M12×1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	35	43	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	34	44	50	63	80	95	130
C9 ²	114.5	145	184	232	313	377	500
B	5	5	6	10	12	16	20
H	15	18	24.5	35	43	59	79.5

※C1 ~ C9是公制标准马达连接板尺寸，请依所选用的马达决定。
 ※C1 ~ C9 are motor specitc dimensions(metric std shown).
 Size may vary according to motor flange chosen.
 ※Specification subject to change without notice.

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PHR性能规格共表 Specifications Table

规格 Specifications			节数 Stage	减速比 Ratio	PHR-50	PHR-70	PHR-90	PHR-120	PHR-142	PHR-180	PHR-220	
额定输出力矩 T_{2N} Nominal Output Torque	$N \cdot m$	1		3	19	53	145	290	520	950	1550	
			4	20	55	150	300	550	1000	1650		
			5	17	54	140	290	530	1050	1700		
			6	15	46	135	280	490	1000	1600		
			7	14	44	125	270	450	960	1500		
			8	12	41	110	240	390	900	1350		
			9	11	37	95	220	360	800	1250		
			10	11	37	95	220	360	800	1250		
		2	节数 Stage	减速比 Ratio	PHR-50	PHR-70	PHR-90	PHR-120	PHR-142	PHR-180	PHR-220	
			15	19	53	145	290	520	950	1550		
			20	20	55	150	300	550	1000	1650		
			25	17	54	140	290	530	1050	1700		
			30	17	54	140	290	530	1050	1700		
			35	17	54	140	290	530	1050	1700		
			40	17	54	140	290	530	1050	1700		
			45	17	54	140	290	530	1050	1700		
			50	17	54	140	290	530	1050	1700		
			60	15	46	135	280	490	1000	1600		
			70	14	44	125	270	450	960	1500		
			80	12	41	110	240	390	900	1350		
			90	11	37	95	220	360	800	1250		
100	11	37	95	220	360	800	1250					
急停力矩 T_{2NOT} Emergency Stop Torque	$N \cdot m$	3.0倍额定输出力矩（3.0 times of Nominal Output Torque） ①最大输出力矩 Max.Output Torque T_{2B} =60% of Emergency Stop Torque										
额定输入转速 n_{1N} Nominal Input Speed	rpm	1.2	3-100	5000	5000	4000	4000	3000	3000	2000		
最大输入转速 n_{1max} Max.Input Speed	rpm	1.2	3-100	10000	10000	8000	8000	6000	6000	4000		
超精密背隙 Ultraprecise Backlash P_0	arcmin	1	3-10	≧2	≧2	≧2	≧1	≧1	≧1	≧1		
		2	12-100	≧4	≧4	≧4	≧3	≧3	≧3	≧3		
精密背隙 Precise Backlash P_1	arcmin	1	3-10	≧4	≧4	≧4	≧3	≧3	≧3	≧3		
		2	12-100	≧6	≧6	≧6	≧5	≧5	≧5	≧5		
标准背隙 Standard Backlash P_2	arcmin	1	3-10	≧6	≧6	≧6	≧5	≧5	≧5	≧5		
		2	12-100	≧8	≧8	≧8	≧7	≧7	≧7	≧7		
扭转刚性 Torsional Rigidity	$N \cdot m$ /arcmin	1.2	3-100	2.5	6	12	23	45	75	130		
①容许径向力 F_{2rB} Max.Radial Load	N	1.2	3-100	515	1010	1780	3420	5380	8330	11120		
①容许轴向力 F_{2aB} Max.Axial Load	N	1.2	3-100	410	600	1500	2650	4670	6460	8560		
使用温度 Operating Temp.	℃		3-100	-10℃ ~ +90℃								
使用寿命 Service Life	hr		3-100	20,000(10,000/连续运转 Continuous operation)								
效率 Efficiency	%	1	3-10	≧97%								
		2	12-100	≧94%								
重量 Weight	kg	1	3-10	0.6	1.3	3.5	7.8	16.1	27	58		
		2	12-100	0.9	2.0	5.6	9.5	19	34	65		
安装方向 Mounting Position	-	1.2	3-100	任意方向 Any direction								
②噪音值 Noise Level	dBA/1m	1.2	3-100	56	58	60	63	65	67	70		
防护等级 Protection Class	-	1.2	3-100	Ip65								
润滑 Lubrication	-	1.2	3-100	全合成润滑油脂 Synthetic Lubricant								
减速机转动惯量 Inertia (J1)												
节数 Stage	减速比 Ratio	单位 unit		PHR-50	PHR-70	PHR-90	PHR-120	PHR-142	PHR-180	PHR-220		
1	3	kg.cm ²		0.03	0.23	0.97	2.35	10.00	30.50	79.50		
	4			0.02	0.18	0.67	1.66	7.17	25.86	58.21		
	5			0.02	0.17	0.65	1.50	6.52	23.63	54.36		
	6/7/8			0.02	0.14	0.60	1.45	6.17	22.92	54.12		
	9/10			0.02	0.14	0.58	1.41	6.10	22.73	53.98		
2	节数 Stage		减速比 Ratio	PHR-50	PHR-70	PHR-90	PHR-120	PHR-142	PHR-180	PHR-220		
	15/20/25			0.02	0.17	0.65	0.65	1.50	6.52	23.63		
	30/35/40			0.02	0.14	0.60	0.60	1.45	6.17	22.92		
	45/50/70/80/90/100			0.02	0.14	0.58	0.58	1.41	6.10	22.73		
①输出转速100rpm时，作用于输出轴中心位置 Applied to the output shaft center@100rpm. ②3000rpm空载量测 Measured at 3000rpm with no load.												
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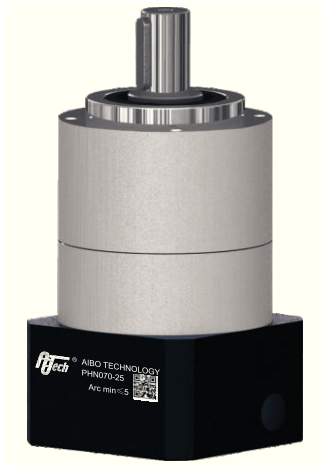
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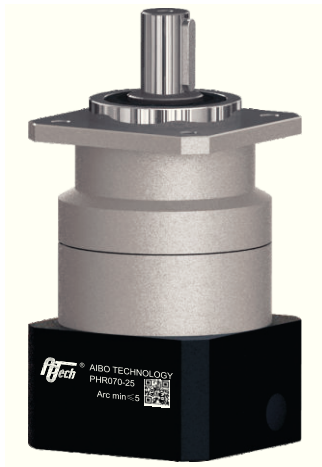
PHF



PHN

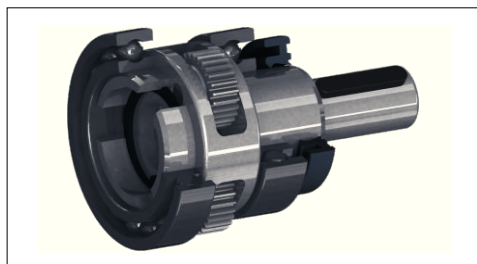


PHR



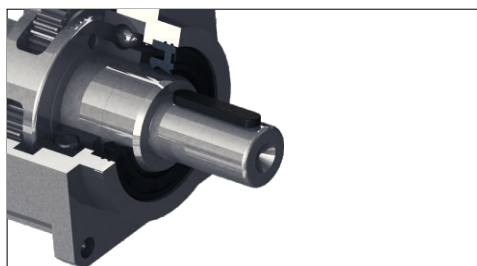
PSF系列 产品特点

PSF SERIES FEATURES



行星固定架及出力轴设计一体成型。且前后培林设定位置为大跨距，可达到最大扭转刚性及出力轴高径向负载能力。

Planetary arm bracket and output shaft are one-piece constructed, setting bearing apart for larger span to reach the largest reverse rigid and contribute high axis radial load capacity.



出力轴表面为研磨光面处理Ra 0.2μm。与油封搭配确保最低摩擦系数相对减少启动负载。保持最佳密封性，延长使用寿命。

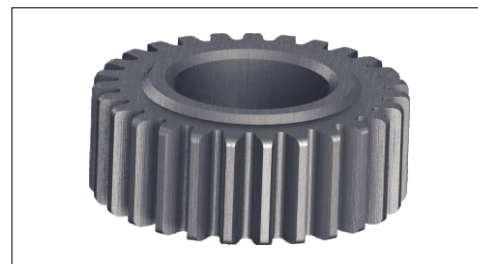
Grinding process Ra 0.2μm to smooth surface of output shaft, and with oil-seal to minimum friction coefficient and reducing start up load; result in the best seal-ability and extended lifespan.



本体独家采用最新高科技材料，齿箱与内环齿一体锻造成形，再经日本三菱顶级插齿机加工。具有高精度，高扭力，耐磨耗等特点。先进无电解镍表面处理，耐刮，耐腐蚀，最适合高科技设备严苛要求。

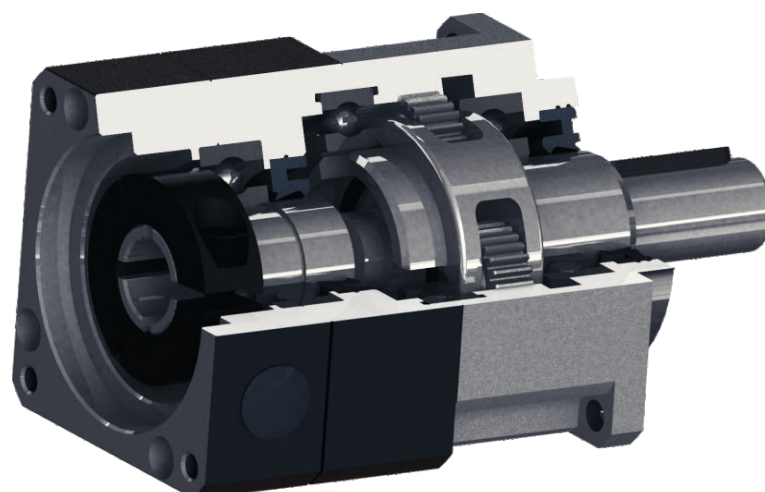
RD use exclusively the latest high-tech materials. The gear box and internal gear are one-piece constructed, and then processed with Mitsubishi Japan gear shaper machinery for high-precision, high torque and abrasion consumption.

Advanced electroless nickel surface treatment, scratch resistance, corrosion resistance, are the most suitable for strict requirements of the high-tech equipment.



齿轮材质选用高级合金钢，独特真空渗碳及热处理至最佳硬度。兼具表面硬度及心部韧性，并经过齿型研磨加工，以获得最佳的精度、高耐磨耗及高耐冲击韧性。

Alloy steel gear with unique vacuum carburizing and heat treatment for the best surface hardness and inner core tenacity. Additionally, with gear grinding processing to get the best accuracy high wear resistance and high impact toughness.



PSF系列在结构的整体设计上能够容许伺服马达高转速的输入，达到最大扭力输出。精密齿轮设计及专业齿轮加工，制造出低运转背隙、高效率、运转平顺、低噪音及长寿命的行星减速机。

PSF series allows high speed servo motor input, reaching maximum torque output. precision gear design and professional gear processing create a low backlash operation, high efficiency, smooth operation, low noise and long life planetary reducer.



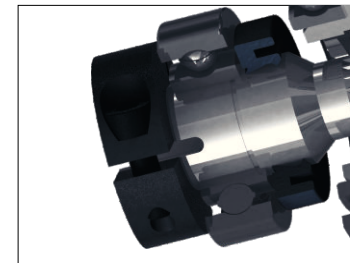
行星齿轮传动界面采用滚针轴承，以达到最大输出扭力和最小间隙公差，提高结构钢性及转动的平稳性。

Interface of planetary gear transmission are equipped with a needle bearing, in order to achieve the maximum output torque and the minimum gap tolerance, improve the structure of steel and rotational stability.



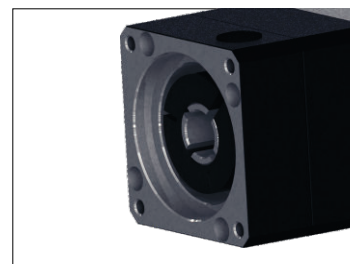
太阳齿前端轴承直接置入于行星固定架内，整体机械结构设计，以确保传动元件的同心率及运转平稳性。

The sun pinion front bearing is directly arranged in the fixed frame the whole planet. Mechanical structure design, in order to ensure the concentric drive element and the operation stability.



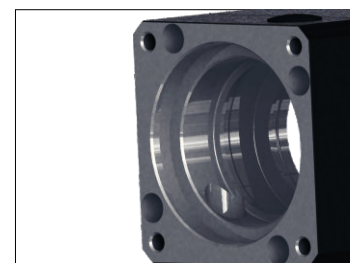
采用与世界知名品牌同款润滑油，搭配高科技油封设计，上唇为防尘唇，下唇为防油唇。采IP65防护等级的密封设计，不泄漏、永久免保养。

High-tech oil seal design on the upper lip guard against dust intruder, lower lip to guard against oil leak. Protection grade Ip65 safeguards fully avoid leaking problem, and given it maintenance-free.



减速机输入端与马达轴连接方法采用栓紧式机构锁紧环经过动平衡分析，确保高转速下，结合界面的同心度及零滑差动力传递。

Input-end and motor shaft are combined through a dynamic balanced collar clamping mechanism to ensure connection interface concentricity and zero slip power transmission at high speed.



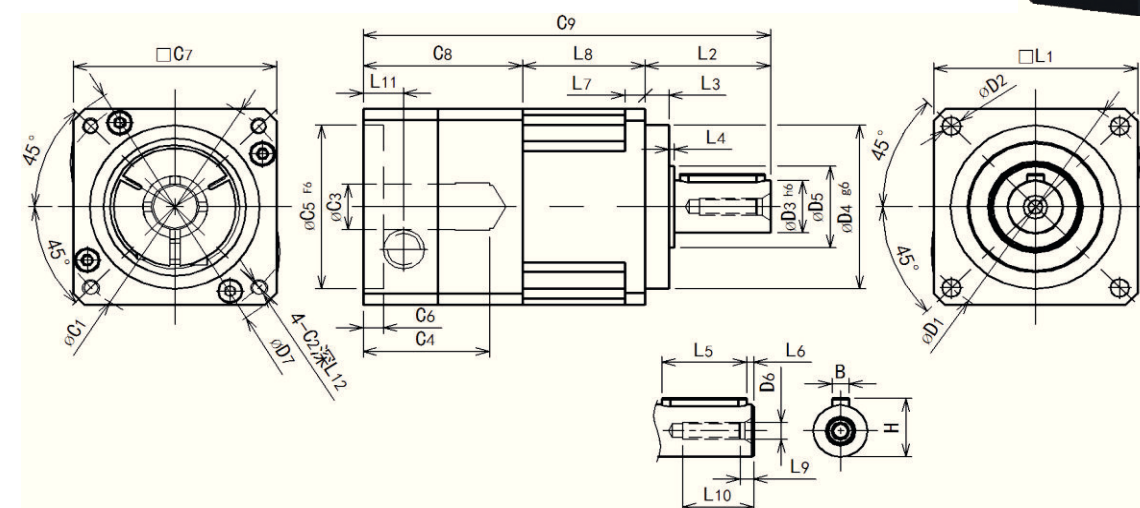
先进马达连接板设计，配合轴套，安装容易，可与各种厂牌之伺服、步进马达完美搭配组合。

Advanced motor connecting plate design combined with the shaft sleeve, installation easily, with various brands of servo, or stepper motor.

产品因人为原因或天灾等因素导致不良或损坏，不在保固范围内。

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

PSF 单段外型尺寸图 PSF Single Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PSF42	PSF60	PSF90	PSF115	PSF142	PSF180	PSF220
D1	50	70	100	130	165	215	250
D2	3.4	5.5	6.5	8.5	10.5	13	17
D3 _{h6}	13	16	22	32	40	55	75
D4 _{g6}	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P	M20×2.5P	M20×2.5P
D7	56	80	118	148	186	239	292
L1	42.6	60	90	115	142	182	220
L2	26	37	48	62	93	104.5	138
L3	5.5	7	10	8	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	4	6	8	12	18	16	20
L8	28.3	36	46	59	79	87.5	117.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	9.5	11	14.5	21	17	25.5	27.8
L12	15	20	25	30	35	35	40
C1 ²	46	70	90	115	145	200	235
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M12×1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	37	47	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	4	6	10	6	13	12
C7 ²	42.6	60	90	115	140	182	220
C8 ²	38.5	46	55	63	80	95	130
C9 ²	92.8	119	149	184	252	287	385.5
B	5	5	6	10	12	16	20
H	15	18	24.5	35	43	59	79.5

※C1 ~ C9是公制标准马达连接板尺寸，请依所选用的马达决定。

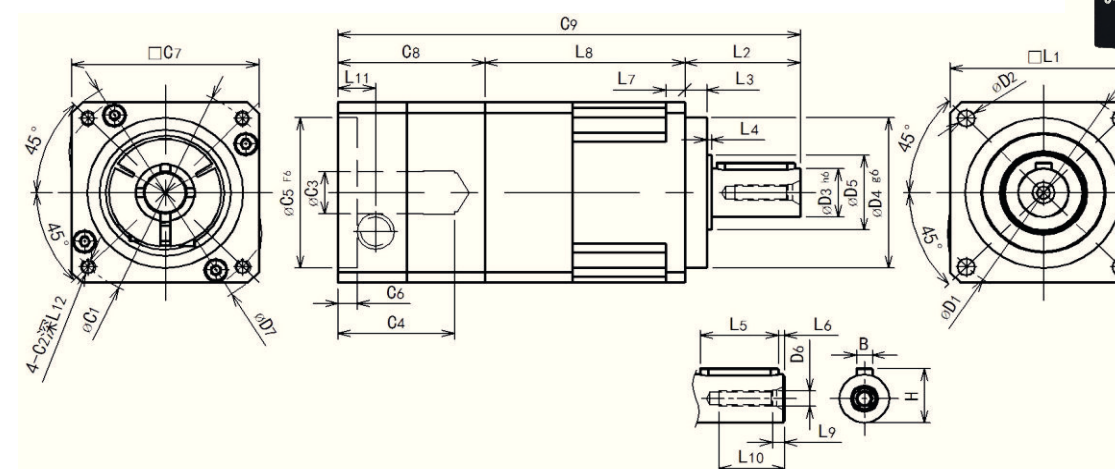
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※C1 ~ C9 are motor specific dimensions(metric std shown).

Size may vary according to motor flange chosen.

※Specification subject to change without notice.

PSF 双段外型尺寸图 PSF Double Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PSF42	PSF60	PSF90	PSF115	PSF142	PSF180	PSF220
D1	50	70	100	130	165	215	250
D2	3.4	5.5	6.5	8.5	10.5	13	17
D3 _{h6}	13	16	22	32	40	55	75
D4 _{g6}	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P	M20×2.5P	M20×2.5P
D7	56	80	118	148	186	239	292
L1	42.6	60	90	115	142	182	220
L2	26	37	48	62	93	104.5	138
L3	5.5	7	10	8	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	4	6	8	12	18	16	20
L8	54.3	64	86	107	140	177.5	232
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	9.5	11	14.5	21	17	25.5	27.8
L12	15	20	25	30	35	35	40
C1 ²	46	70	90	115	145	200	235
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M12×1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	37	47	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	4	6	10	6	13	12
C7 ²	42.6	60	90	115	140	182	220
C8 ²	38.5	46	55	63	80	95	130
C9 ²	118.8	147	189	232	313	377	500
B	5	5	6	10	12	16	20
H	15	18	24.5	35	43	59	79.5

※C1 ~ C9是公制标准马达连接板尺寸，请依所选用的马达决定。

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※C1 ~ C9 are motor specific dimensions(metric std shown).

Size may vary according to motor flange chosen.

※Specification subject to change without notice.

PSF 性能规格共表 Specifications Table

规格 Specifications			节数 Stage	减速比 Ratio	PSF-42	PSF-60	PSF-90	PSF-115	PSF-142	PSF-180	PSF-220
额定输出力矩 T_{2N} Nominal Output Torque		$N \cdot m$	1	3	13.8	44.2	95.2	283	482	1151	1670
				4	11.9	35.9	74.6	249	490	1055	1574
				5	13.8	43.0	95.2	283	473	1151	1670
				6	12.5	39.4	90.9	266	436	1055	1574
				7	11.9	36.0	85.6	219	400	1055	1574
				8	10.9	32.4	85.0	216	363	860	1184
				9	9.8	28.7	85.0	210	320	764	1185
			节数 Stage	减速比 Ratio	PSF-42	PSF-60	PSF-90	PSF-115	PSF-142	PSF-180	PSF-220
				15	13.8	44.2	95.2	283	482	1151	1670
				20	11.9	35.9	74.6	249	490	1055	1574
				25	13.8	43.0	95.2	283	473	1151	1670
				30	13.8	43.0	95.2	283	473	1151	1670
				35	13.8	43.0	95.2	283	473	1151	1670
				40	13.8	43.0	95.2	283	473	1151	1670
			2	45	13.8	43.0	95.2	283	473	1151	1670
				50	13.8	43.0	95.2	283	473	1151	1670
				60	12.5	39.4	90.9	266	436	1055	1574
				70	11.9	36.0	85.6	219	400	1055	1574
				80	10.9	32.4	85.0	216	363	860	1184
90	9.8	28.7		80.0	210	320	764	1185			
100	10.1	25.0		75.0	210	320	763	1184			
急停力矩 T_{2NOT} Emergency Stop Torque		$N \cdot m$	3.0倍额定输出力矩 (3.0 times of Nominal Output Torque) (*最大输出力矩 Max.Output Torque T_{2B} =60% of Emergency Stop Torque)								
额定输入转速 n_{1N} Nominal Input Speed		rpm	1.2	3-100	3000	3000	3000	2500	2000	2000	2000
最大输入转速 n_{1max} Max.Input Speed		rpm	1.2	3-100	6000	6000	6000	5000	4000	4000	4000
超精密背隙 Ultraprecise Backlash P_0		arcmin	1	3-10	-	-	-	≦3	≦3	≦3	≦3
			2	12-100	-	-	-	≦5	≦5	≦5	≦5
精密背隙 Precise Backlash P_1		arcmin	1	3-10	-	≦6	≦6	≦5	≦5	≦5	≦5
			2	12-100	-	≦9	≦9	≦7	≦7	≦7	≦7
标准背隙 Standard Backlash P_2		arcmin	1	3-10	≦12	≦9	≦9	≦7	≦7	≦7	≦7
			2	12-100	≦15	≦12	≦12	≦9	≦9	≦9	≦9
扭转刚性 Torsional Rigidity		$N \cdot m$ /arcmin	1.2	3-100	1.0	2.8	7.5	15.5	30	57	110
①容许径向力 F_{2rB} Max.Radial Load		N	1.2	3-100	350	960	1630	3380	6150	7260	11120
①容许轴向力 F_{2aB} Max.Axial Load		N	1.2	3-100	320	900	1420	2930	5510	5550	8560
使用温度 Operating Temp.		°C		3-100	-10°C ~ +90°C						
使用寿命 Service Life		hr		3-100	20,000(10,000/连续运转 Continuous operation)						
效率 Efficiency		%	1	3-10	≧96%						
			2	12-100	≧92%						
重量 Weight		kg	1	3-10	0.6	1.2	3.2	7.5	15.6	26	56
			2	12-100	0.8	1.9	5.3	12	20.7	36	80
安装方向 Mounting Position		-	1.2	3-100	任意方向 Any direction						
②噪音值 Noise Level		dBA/1m	1.2	3-100	60	62	65	65	70	70	75
防护等级 Protection Class		-	1.2	3-100	Ip65						
润滑 Lubrication		-	1.2	3-100	全合成润滑油脂 Synthetic Lubricant						
减速机转动惯量 Inertia (J1)											
节数 Stage	减速比 Ratio	单位 unit		PSF-42	PSF-60	PSF-90	PSF-115	PSF-142	PSF-180	PSF-220	
1	3	kg.cm ²		0.30	0.20	0.81	2.20	7.89	25.2	77.9	
	4			0.20	0.16	0.65	1.80	5.83	19.8	56.5	
	5			0.20	0.15	0.62	1.61	5.38	18.3	53.3	
	6/7/8			0.20	0.14	0.60	1.55	5.22	17.8	53.0	
	9/10			0.20	0.14	0.60	1.53	5.20	17.6	52.9	
节数 Stage	减速比 Ratio			PSF-42	PSF-60	PSF-90	PSF-115	PSF-142	PSF-180	PSF-220	
2	15/20/25			0.02	0.15	0.62	1.61	5.38	18.3	53.9	
	30/35/40			0.02	0.14	0.60	1.55	5.22	17.8	53.0	
	45/50/70/80/90/100			0.02	0.14	0.60	1.53	5.20	17.6	52.9	
①输出转速100rpm时，作用于输出轴中心位置 Applied to the output shaft center@100rpm. ②3000rpm空载量测 Measured at 3000rpm with no load.											
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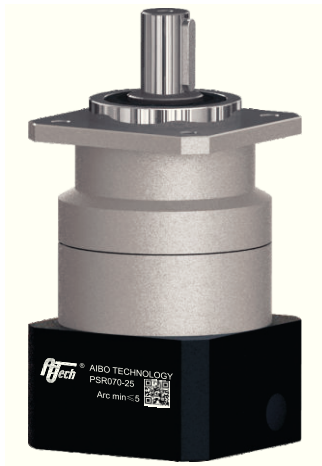
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PSF

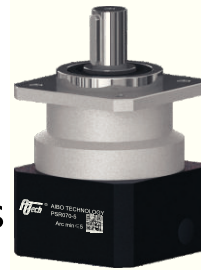


PSR

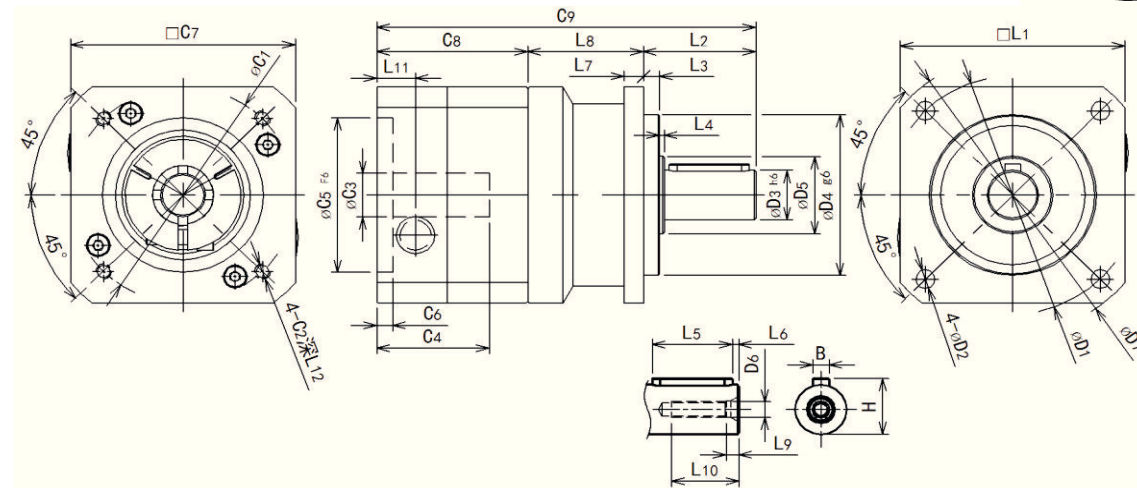


PSN





PSR 单段外型尺寸图 PSR Single Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PSR50	PSR70	PSR90	PSR120	PSR142	PSR180	PSR220
D1	50	70	100	130	165	215	250
D2	3.4	6	6.5	8.5	10.5	13	17
D3 _{h6}	13	16	22	32	40	55	75
D4 _{g6}	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P	M20×2.5P	M20×2.5P
D7	64	90	120	152	186	239	292
L1	50	70	94	120	142	182	220
L2	24.5	37	43	60	93	104.5	138
L3	4	7	5	6	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	5	6	10	12	18	16	20
L8	30	36	51	61	79	87.5	117.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	9.6	11	13.5	21	17	25.5	27.8
L12	15	20	25	30	35	35	40
C1 ²	46	70	90	115	145	200	235
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M12×1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	35	43	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	34	44	50	63	80	95	130
C9 ²	88.5	117	144	184	252	287	385.5
B	5	5	6	10	12	16	20
H	15	18	24.5	35	43	59	79.5

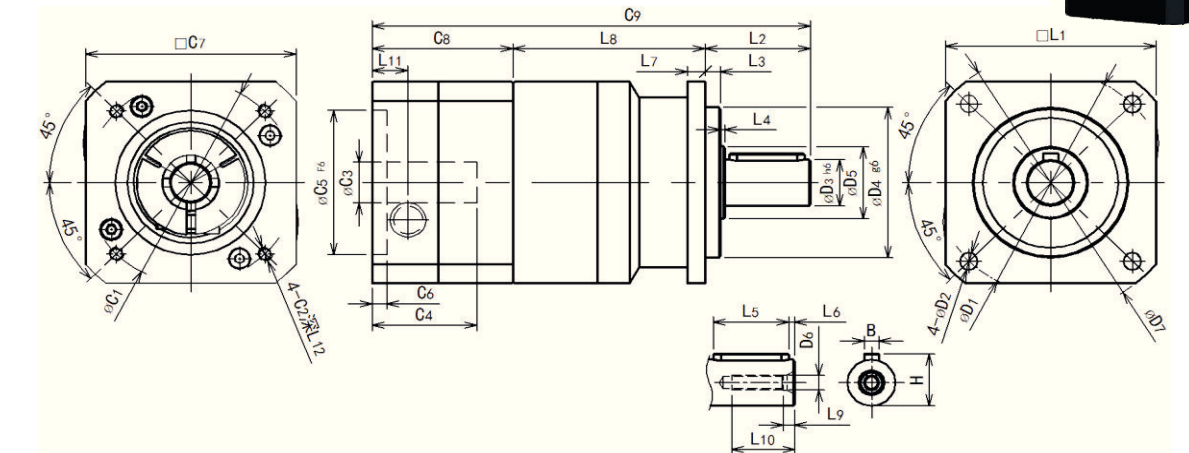
※C1~C9是公制标准马达连接板尺寸，请依所选用的马达决定。

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※C1~C9 are motor specific dimensions(metric std shown).
Size may vary according to motor flange chosen.

※Specification subject to change without notice.

PSR 双段外型尺寸图 PSR Double Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PSR50	PSR70	PSR90	PSR120	PSR142	PSR180	PSR220
D1	50	70	100	130	165	215	250
D2	3.4	6	6.5	8.5	10.5	13	17
D3 _{h6}	13	16	22	32	40	55	75
D4 _{g6}	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P	M20×2.5P	M20×2.5P
D7	64	90	120	152	186	239	292
L1	50	70	94	120	142	182	220
L2	24.5	37	43	60	93	104.5	138
L3	4	7	5	6	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	5	6	10	12	18	16	20
L8	56	64	91	109	140	177.5	232
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	9.6	11	13.5	21	17	25.5	27.8
L12	15	20	25	30	35	35	40
C1 ²	46	70	90	115	145	200	235
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M12×1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	35	43	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	34	44	50	63	80	95	130
C9 ²	114.5	145	184	232	313	377	500
B	5	5	6	10	12	16	20
H	15	18	24.5	35	43	59	79.5

※C1~C9是公制标准马达连接板尺寸，请依所选用的马达决定。

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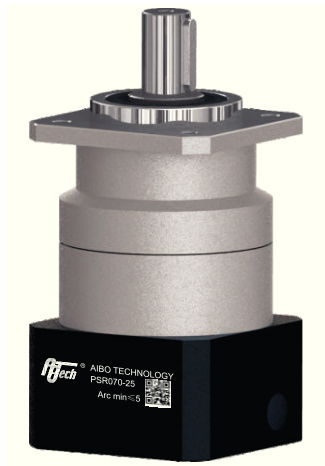
※C1~C9 are motor specific dimensions(metric std shown).
Size may vary according to motor flange chosen.

※Specification subject to change without notice.

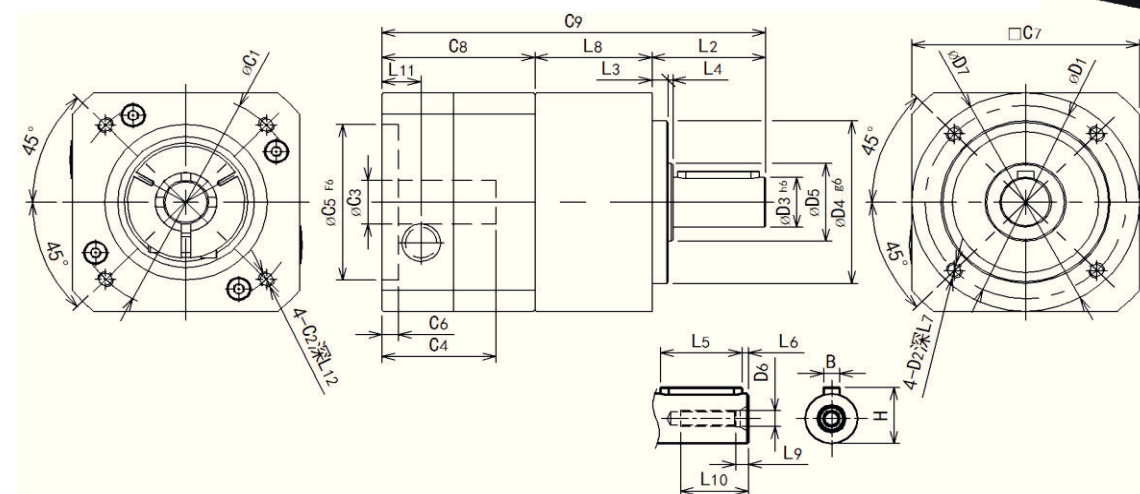
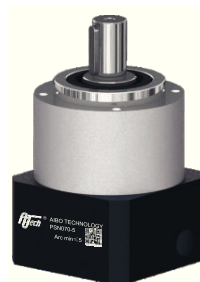
PSR 性能规格共表 Specifications Table

规格 Specifications		节数 Stage	减速比 Ratio	PSR-50	PSR-70	PSR-90	PSR-120	PSR-142	PSR-180	PSR-220
额定输出力矩 T_{2N} Nominal Output Torque	N·m	1	3	13.8	44.2	95.2	283	482	1151	1670
			4	11.9	35.9	74.6	249	490	1055	1574
			5	13.8	43.0	95.2	283	473	1151	1670
			6	12.5	39.4	90.9	266	436	1055	1574
			7	11.9	36.0	85.6	219	400	1055	1574
			8	10.9	32.4	85.0	216	363	860	1184
			9	9.8	28.7	85.0	210	320	764	1185
			10	10.1	25.0	75.0	210	320	763	1184
		2	15	13.8	44.2	95.2	283	482	1151	1670
			20	11.9	35.9	74.6	249	490	1055	1574
			25	13.8	43.0	95.2	283	473	1151	1670
			30	13.8	43.0	95.2	283	473	1151	1670
			35	13.8	43.0	95.2	283	473	1151	1670
			40	13.8	43.0	95.2	283	473	1151	1670
			45	13.8	43.0	95.2	283	473	1151	1670
			50	13.8	43.0	95.2	283	473	1151	1670
			60	12.5	39.4	90.9	266	436	1055	1574
			70	11.9	36.0	85.6	219	400	1055	1574
			80	10.9	32.4	85.0	216	363	860	1184
			90	9.8	28.7	80.0	210	320	764	1185
			100	10.1	25.0	75.0	210	320	763	1184
急停力矩 T_{2NOT} Emergency Stop Torque	N·m	3.0倍额定输出力矩 (3.0 times of Nominal Output Torque) (*最大输出力矩 Max.Output Torque T_{2B} =60% of Emergency Stop Torque)								
额定输入转速 n_{1N} Nominal Input Speed	rpm	1.2	3-100	3000	3000	3000	2500	2000	2000	2000
最大输入转速 n_{1max} Max.Input Speed	rpm	1.2	3-100	6000	6000	6000	5000	4000	4000	4000
超精密背隙 Ultraprecise Backlash P_0	arcmin	1	3-10	-	-	-	≤3	≤3	≤3	≤3
		2	12-100	-	-	-	≤5	≤5	≤5	≤5
精密背隙 Precise Backlash P_1	arcmin	1	3-10	-	≤6	≤6	≤5	≤5	≤5	≤5
		2	12-100	-	≤9	≤9	≤7	≤7	≤7	≤7
标准背隙 Standard Backlash P_2	arcmin	1	3-10	≤12	≤9	≤9	≤7	≤7	≤7	≤7
		2	12-100	≤15	≤12	≤12	≤9	≤9	≤9	≤9
扭转刚性 Torsional Rigidity	N·m/arcmin	1.2	3-100	1.0	2.8	7.5	15.5	30	57	110
①容许径向力 F_{2rB} Max.Radial Load	N	1.2	3-100	350	960	1630	3380	6150	7260	11120
①容许轴向力 F_{2aB} Max.Axial Load	N	1.2	3-100	320	900	1420	2930	5510	5550	8560
使用温度 Operating Temp.	℃		3-100	-10℃ ~ +90℃						
使用寿命 Service Life	hr		3-100	20,000(10,000/连续运转 Continuous operation)						
效率 Efficiency	%	1	3-10	≥96%						
		2	12-100	≥92%						
重量 Weight	kg	1	3-10	0.7	1.4	3.0	7.3	15.6	26	56
		2	12-100	0.9	2.2	5.0	11.5	20.7	36	80
安装方向 Mounting Position	-	1.2	3-100	任意方向 Any direction						
②噪音值 Noise Level	dBA/1m	1.2	3-100	60	62	65	65	70	70	75
防护等级 Protection Class	-	1.2	3-100	Ip65						
润滑 Lubrication	-	1.2	3-100	全合成润滑油脂 Synthetic Lubricant						
减速机转动惯量 Inertia (J1)										
节数 Stage	减速比 Ratio	单位 unit		PSR-50	PSR-70	PSR-90	PSR-120	PSR-142	PSR-180	PSR-220
1	3	kg.cm²		0.30	0.20	0.81	2.20	7.89	25.2	77.9
	4			0.20	0.16	0.65	1.80	5.83	19.8	56.5
	5			0.20	0.15	0.62	1.61	5.83	18.3	53.3
	7			0.20	0.14	0.60	1.55	5.22	17.8	53.0
	10			0.20	0.14	0.60	1.53	5.20	17.6	52.9
节数 Stage	减速比 Ratio			PSR-50	PSR-70	PSR-90	PSR-120	PSR-142	PSR-180	PSR-220
2	15/20/25			0.02	0.15	0.62	1.61	5.83	18.3	53.9
	30/35/40			0.02	0.14	0.60	1.55	5.22	17.8	53.0
	50/70/100			0.02	0.14	0.60	1.53	5.20	17.6	52.9
①输出转速100rpm时，作用于输出轴中心位置 Applied to the output shaft center@100rpm. ②3000rpm空载量测Measured at 3000rpm with no load.										
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Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



PSN 单段外型尺寸图 PSN Single Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PSN50	PSN70	PSN90	PSN120	PSN155	PSN205	PSN235
D1	44	62	80	108	140	184	210
D2	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M16×2.0P
D3h6	13	16	22	32	40	55	75
D4h6	35	52	68	90	120	160	180
D5	15	25	35	45	50	70	90
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P	M20×2.5P	M20×2.5P
D7	50	70	94	120	155	205	235
L2	24.5	35	48	60	93	99.5	126
L3	4	5	10	6	8	15	18
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	8	10	10	15	18	21	32
L8	30	38	46	61	79	92.5	129.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	9.6	11	13.5	21	17	25.5	27.8
L12	15	20	25	30	35	35	40
C1 ²	46	70	90	115	145	200	235
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M12×1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	35	43	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	34	44	50	63	80	95	130
C9 ²	88.5	117	144	184	252	287	385.5
B	5	5	6	10	12	16	20
H	15	18	24.5	35	43	59	79.5

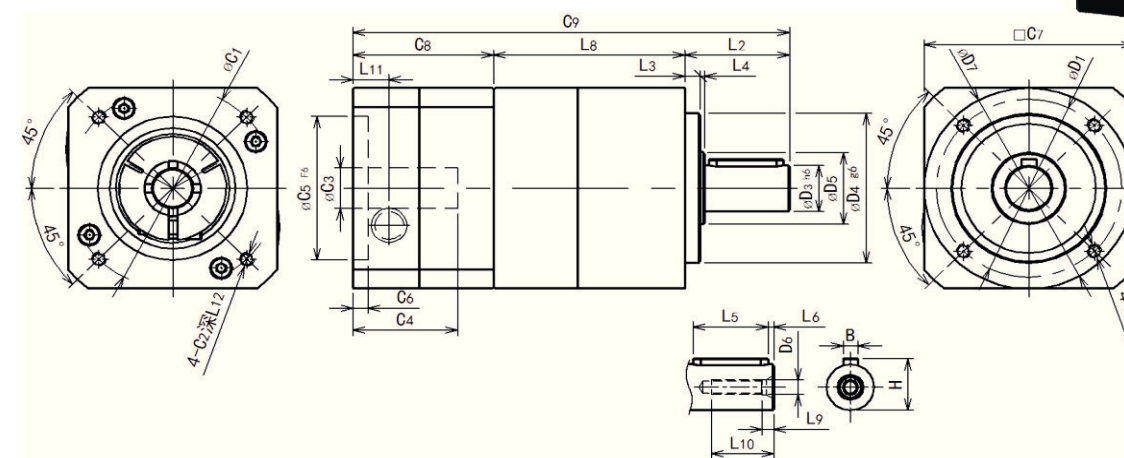
※C1 ~ C9是公制标准马达连接板尺寸，请依所选用的马达决定。

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※C1 ~ C9 are motor specific dimensions(metric std shown).
Size may vary according to motor flange chosen.

※Specification subject to change without notice.

PSN 双段外型尺寸图 PSN Double Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PSN50	PSN70	PSN90	PSN120	PSN155	PSN205	PSN235
D1	44	62	80	108	140	184	210
D2	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M16×2.0P
D3h6	13	16	22	32	40	55	75
D4g6	35	52	68	90	120	160	180
D5	15	25	35	45	50	70	90
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P	M20×2.5P	M20×2.5P
D7	50	70	94	120	155	205	235
L2	24.5	35	48	60	93	99.5	126
L3	4	5	10	6	8	15	18
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	8	10	10	15	18	21	32
L8	56	66	86	109	140	182.5	244
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	9.6	11	13.5	21	17	25.5	27.8
L12	15	20	25	30	35	35	40
C1 ²	46	70	90	115	145	200	235
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P	M12×1.75P	M12×1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	35	43	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	34	44	50	63	80	95	130
C9 ²	114.5	145	184	232	313	377	500
B	5	5	6	10	12	16	20
H	15	18	24.5	35	43	59	79.5

※C1 ~ C9是公制标准马达连接板尺寸，请依所选用的马达决定。

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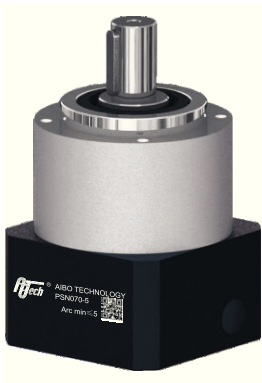
※C1 ~ C9 are motor specific dimensions(metric std shown).
Size may vary according to motor flange chosen.

※Specification subject to change without notice.

PSN 性能规格共表 Specifications Table

规格 Specifications		节数 Stage	减速比 Ratio	PSN-50	PSN-70	PSN-90	PSN-120	PSN-155	PSN-205	PSN-235
额定输出力矩 T _{2N} Nominal Output Torque	N·m	1	3	13.8	44.2	95.2	283	482	1151	1670
			4	11.9	35.9	74.6	249	490	1055	1574
			5	13.8	43.0	95.2	283	473	1151	1670
			6	12.5	39.4	90.9	266	436	1055	1574
			7	11.9	36.0	85.6	219	400	1055	1574
			8	10.9	32.4	85.0	216	363	860	1184
			9	9.8	28.7	85.0	210	320	764	1185
		10	10.1	25.0	75.0	210	320	763	1184	
		2	15	13.8	44.2	95.2	283	482	1151	1670
			20	11.9	35.9	74.6	249	490	1055	1574
			25	13.8	43.0	95.2	283	473	1151	1670
			30	13.8	43.0	95.2	283	473	1151	1670
			35	13.8	43.0	95.2	283	473	1151	1670
			40	13.8	43.0	95.2	283	473	1151	1670
			45	13.8	43.0	95.2	283	473	1151	1670
			50	13.8	43.0	95.2	283	473	1151	1670
			60	12.5	39.4	90.9	266	436	1055	1574
			70	11.9	36.0	85.6	219	400	1055	1574
			80	10.9	32.4	85.0	216	363	860	1184
			90	9.8	28.7	80.0	210	320	764	1185
			100	10.1	25.0	75.0	210	320	763	1184
急停力矩 T _{2NOT} Emergency Stop Torque	N·m		3.0倍额定输出力矩 (3.0 times of Nominal Output Torque) (*最大输出力矩 Max.Output Torque T _{2B} =60% of Emergency Stop Torque)							
额定输入转速 n _{1N} Nominal Input Speed	rpm	1.2	3-100	3000	3000	3000	2500	2000	2000	2000
最大输入转速 n _{1max} Max.Input Speed	rpm	1.2	3-100	6000	6000	6000	5000	4000	4000	4000
超精密背隙 Ultraprecise Backlash P ₀	arcmin	1	3-10	-	-	-	≤3	≤3	≤3	≤3
精密背隙 Precise Backlash P ₁	arcmin	2	12-100	-	-	-	≤5	≤5	≤5	≤5
		1	3-10	-	≤6	≤6	≤5	≤5	≤5	≤5
标准背隙 Standard Backlash P ₂	arcmin	2	12-100	-	≤9	≤9	≤7	≤7	≤7	≤7
		1	3-10	≤12	≤9	≤9	≤7	≤7	≤7	≤7
扭转刚性 Torsional Rigidity	N·m /arcmin	2	12-100	≤15	≤12	≤12	≤9	≤9	≤9	≤9
		1.2	3-100	1.0	2.8	7.5	15.5	30	57	110
①容许径向力 F _{2rB} Max.Radial Load	N	1.2	3-100	350	960	1630	3380	6150	7260	11120
①容许轴向力 F _{2aB} Max.Axial Load	N	1.2	3-100	320	900	1420	2930	5510	5550	8560
使用温度 Operating Temp.	°C		3-100	-10℃ ~ +90℃						
使用寿命 Service Life	hr		3-100	20,000(10,000/连续运转 Continuous operation)						
效率 Efficiency	%	1	3-10	≥96%						
		2	12-100	≥92%						
重量 Weight	kg	1	3-10	0.7	1.4	3.0	7.3	15.6	26	56
		2	12-100	0.9	2.2	5.0	11.5	20.7	36	80
安装方向 Mounting Position	-	1.2	3-100	任意方向 Any direction						
②噪音值 Noise Level	dBA/1m	1.2	3-100	60	62	65	65	70	70	75
防护等级 Protection Class	-	1.2	3-100	Ip65						
润滑 Lubrication	-	1.2	3-100	全合成润滑油脂 Synthetic Lubricant						
减速机转动惯量 Inertia (J1)										
节数 Stage	减速比 Ratio	单位 unit		PSN-50	PSN-70	PSR-90	PSN-120	PSN-155	PSN-205	PSN-235
1	3	kg.cm²		0.30	0.20	0.81	2.20	7.89	25.2	77.9
	4			0.20	0.16	0.65	1.80	5.83	19.8	56.5
	5			0.20	0.15	0.62	1.61	5.83	18.3	53.3
	7			0.20	0.14	0.60	1.55	5.22	17.8	53.0
	10			0.20	0.14	0.60	1.53	5.20	17.6	52.9
节数 Stage	减速比 Ratio			PSN-50	PSN-70	PSN-90	PSN-120	PSN-155	PSN-205	PSN-235
2	15/20/25			0.02	0.15	0.62	1.61	5.83	18.3	53.9
	30/35/40			0.02	0.14	0.60	1.55	5.22	17.8	53.0
	50/70/100			0.02	0.14	0.60	1.53	5.20	17.6	52.9
①输出转速100rpm时，作用于输出轴中心位置 Applied to the output shaft center@100rpm. ②3000rpm空载量测Measured at 3000rpm with no load.										
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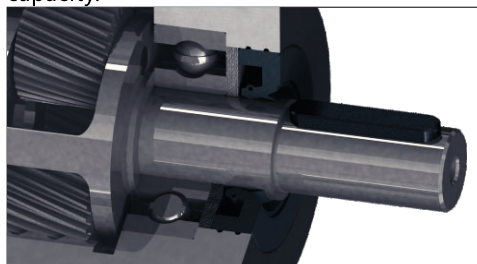


PHZ系列 产品特点

PHZ SERIES FEATURES

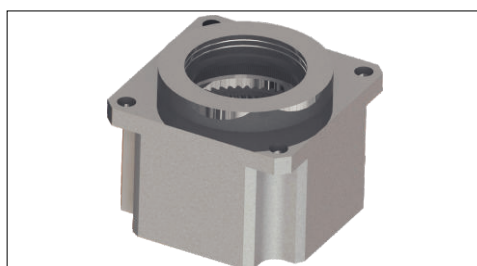


行星固定架及出力轴设计一体成型，且前后培林设定位置为大跨距，可达到最大扭转刚性及出力轴高径向负载能力。
Planetary arm bracket and output shaft are one-piece constructed, setting bearing apart for larger span to reach the largest reverse rigid and contribute high axis radial load capacity.



出力轴表面为研磨光面处理Ra 0.2μm。与油封搭配确保最低摩擦系数和减少启动负载，保持最佳密封性。延长使用寿命。

Grinding process Ra 0.2μm to smooth surface of output shaft, and with oil-seal to minimum friction coefficient and reducing start up load; result in the best seal-ability and extended lifespan.

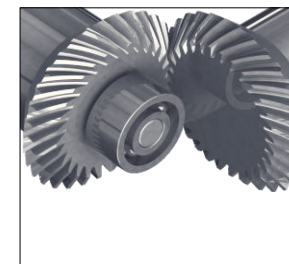
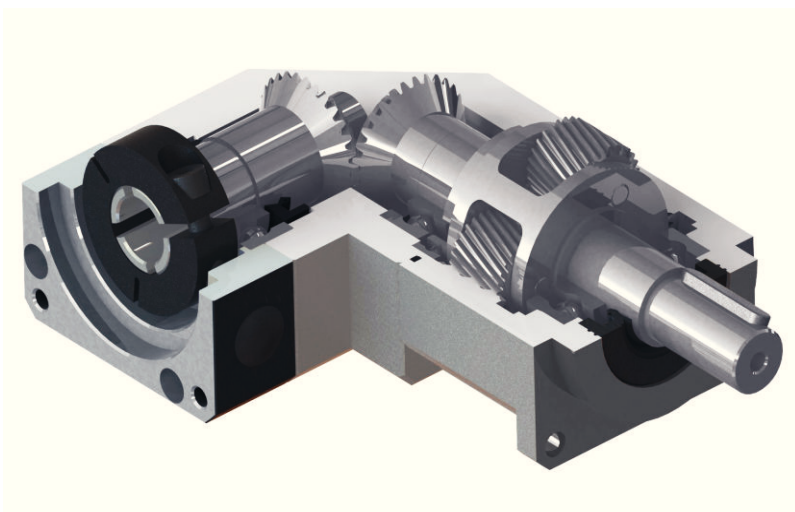


本体独家采用最新高科技材料，齿箱与内环齿一体锻造成形，再经日本三菱顶级插齿机加工。具有高精密度，高扭力，耐磨耗等特点。先进无电解镍表面处理，耐刮，耐腐蚀，最适合高科技设备严苛要求。

RD use exclusively the latest high-tech materials. The gear box and internal gear are one-piece Constiucted, and then processed with Mitsubishi Japan gear shaper machinery for high-precision, high torque and abrade consumption. Advanced electroless nickel surface treatment, scratch resistance, corrosion resistance, are the most suitable for strict requirements of the high-tech equipment.

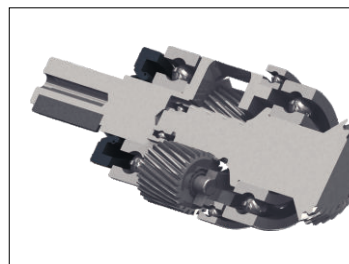
齿轮材质选用高级合金钢，独特真空渗碳及热处理至最佳硬度，兼具表面硬度及心部韧性。并经过齿型研磨加工，以获得最佳的精度、高耐磨耗及高耐冲击韧性。

Alloy steel gear with unique vacuum carburizing and heat treatment for the best surface hardness and inner core tenacity. Additionally, with gear grinding processing to get the best accuracy, high wear resistance and high impact toughness.



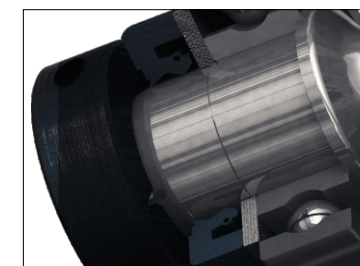
螺旋伞型齿轮采用高级合金钢为材质，再滚齿加工及热处理后，以每组配对的方式研磨处理。达到高精度咬合点及低背隙低噪音。

Alloy steel spiral bevel gears lapping selected after hobbing and heat treatment to ensure high accuracy of the engagement point, low backlash and low noise.



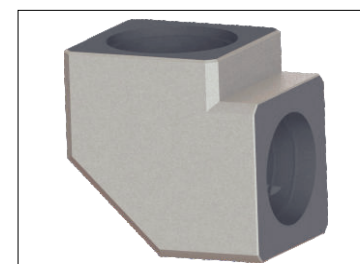
太阳齿前端轴承直接置入于行星固定架内，整体机械结构设计，以确保传动元件的同轴度。

The sun gear bearing is placed directly into the planetary arm bracket, the overall mechanical structure designed to ensure concentricity of the transmission components.



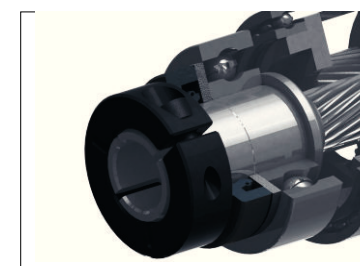
高科技油封设计上唇为防尘盾，下唇为防油唇。IP65防护等级的密封设计，采用高级润滑油脂，不泄漏、永久免保养。

High-tech oil seal design on the upper lip guard against dust intruder, lower lip to guard against oil leak. Advanced lubricants grease and IP65 protection safeguards fully avoid leaking and given it maintenance-free.



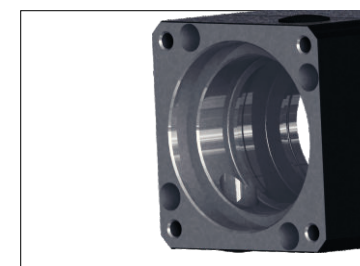
直角加工采用高精度CNC设备。以成熟的设计和过硬的技术获得最高精密组合。螺旋伞齿箱表面无电解镍处理，耐硬刮耐腐蚀最适合高科技设备严苛需求。

Right angular are processed by precision CNC equipment to get the highest combination with spiral bevel gears. Spiral bevel gear box surface without electrolytic nickel, scratch hard corrosion optimal high-tech devices harsh Demand.



输入端与马达入力轴连结方法采用拴紧式机构，环夹经过动平衡分析，确保高转速下，结台界面的同心度及零滑差动力传递。

Input-end and motor shaft are combined through a dynamic balanced collar clamping to ensure connection interface concentricity and zero slip power transmission at high speed.



先进马达连接板设计，配合入力轴衬套，安装容易，可与各种厂牌之伺服、步进马达完美搭配组合。

Advanced motor connecting, plate design combined with the shaft sleeve, installation easily, with various brands of servo, or stepper motor.

PHZ系列整体设计上可容许伺服马达高转速的输入，达到最大扭力输出。直角设计可节省空间。精密齿轮设计及专业齿轮加工，制造出低运转背隙、高效率、低噪音及长寿命的行星减速机。

PHZ Series overall design is suitable for combination operation with servo motor high-speed input and achieves maximum torque output. Right-angular designed drastically reduce the installation space. Precision gear design and gear processing create a planetary gearhead with low backlash operation. high efficiency, low noise and long lifespan.

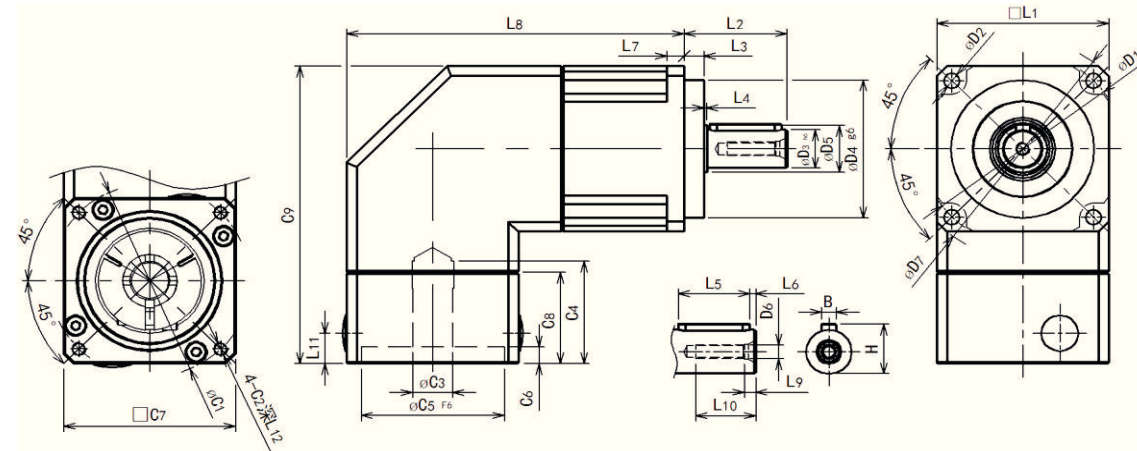
行星齿轮传动界面采用滚针轴承，以达到最大输出扭力和最小间隙公差，提高结构刚性及转动的平稳性。

Interface of planetary gear transmission are equipped with a needle bearing to achieve maximum output torque and the minimum gap tolerance, and to improve the structure of rigid and stable rotation.

产品因人为原因或天灾等因素导致不良或损坏，不在保固范围内。

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

PHZ单段外型尺寸图 PHZ Single Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PHZ42	PHZ60	PHZ90	PHZ115	PHZ142
D1	50	70	100	130	165
D2	3.4	5.5	6.5	8.5	10.5
D3 _{h6}	13	16	22	32	40
D4 _{g6}	35	50	80	110	130
D5	15	25	35	45	50
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P
D7	56	80	118	148	186
L1	42.6	60	90	115	142
L2	26	37	48	62	93
L3	5.5	7	10	8	8
L4	1.5	1.5	1.5	3	6
L5	15	25	32	40	60
L6	2	2	3	5	5
L7	4	6	8	12	18
L8	103.6	148.7	204	244.5	330
L9	4	4	4.5	6	6
L10	14	16.5	20.5	30	38
L11	11.5	11.5	13	16	20.3
L12	15	20	20	30	30
C1 ²	46	70	90	115	145
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P
C3 ²	≤8	≤14	≤19/≤24	≤24	≤35
C4 ²	29	34	44	53	75
C5 ² _{F6}	30	50	70	95	110
C6 ²	6	5	5	6	9
C7 ²	42.6	60	90	115	140
C8 ²	25	33	35	48	65
C9 ²	70.8	107.8	135	174.5	207
B	5	5	6	10	12
H	15	18	24.5	35	43

※C1 ~ C9是公制标准马达连接板尺寸，请依所选用的马达决定。

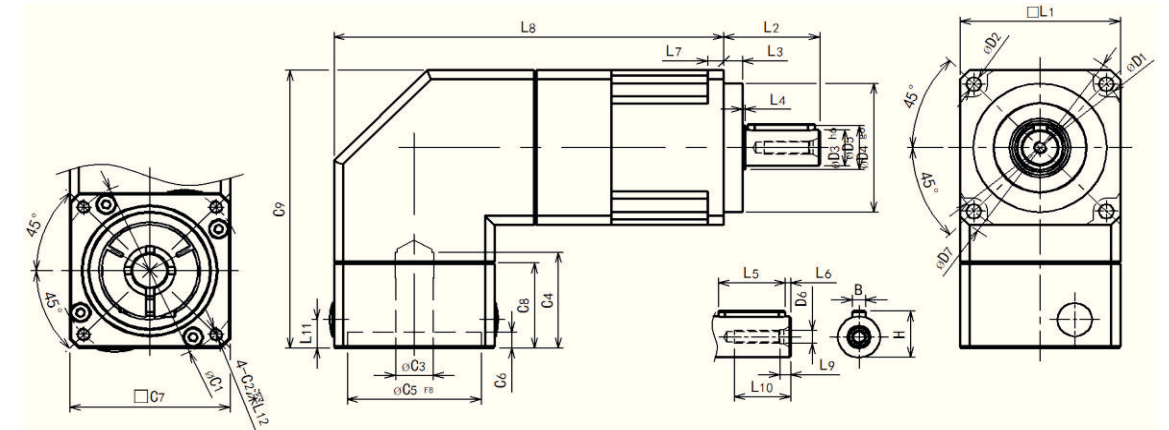
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※C1 ~ C9 are motor specific dimensions(metric std shown).

Size may vary according to motor flange chosen.

※Specification subject to change without notice.

PHZ双段外型尺寸图 PHZ Double Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PHZ42	PHZ60	PHZ90	PHZ115	PHZ142
D1	50	70	100	130	165
D2	3.4	5.5	6.5	8.5	10.5
D3 _{h6}	13	16	22	32	40
D4 _{g6}	35	50	80	110	130
D5	15	25	35	45	50
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P
D7	56	80	118	148	186
L1	42.6	60	90	115	142
L2	26	37	48	62	93
L3	5.5	7	10	8	8
L4	1.5	1.5	1.5	3	6
L5	15	25	32	40	60
L6	2	2	3	5	5
L7	4	6	8	12	18
L8	129.6	176.7	244	292.5	391
L9	4	4	4.5	6	6
L10	14	16.5	20.5	30	38
L11	11.5	11.5	13	16	20.3
L12	15	20	20	30	30
C1 ²	46	70	90	115	145
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P
C3 ²	≤8	≤14	≤19/≤24	≤24	≤35
C4 ²	29	34	44	53	75
C5 ² _{F6}	30	50	70	95	110
C6 ²	6	5	5	6	9
C7 ²	42.6	60	90	115	140
C8 ²	25	33	35	48	65
C9 ²	70.8	107.8	135	174.5	207
B	5	5	6	10	12
H	15	18	24.5	35	43

※C1 ~ C9是公制标准马达连接板尺寸，请依所选用的马达决定。

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※C1 ~ C9 are motor specific dimensions(metric std shown).

Size may vary according to motor flange chosen.

※Specification subject to change without notice.

PHZ 性能规格共表 Specifications Table

规格 Specifications		节数 Stage	减速比 Ratio	PHZ-42	PHZ-60	PHZ-90	PHZ-115	PHZ-142
额定输出力矩 T_{2N} Nominal Output Torque	N·m	1	3	19	53	145	290	520
			4	20	55	150	300	550
			5	17	54	140	290	530
			6	15	46	135	280	490
			7	14	44	125	270	450
			8	12	41	110	240	390
			9	11	37	95	220	360
			10	11	37	95	220	360
		2	15	19	53	145	290	520
			20	20	55	150	300	550
			25	17	54	140	290	530
			30	17	54	140	290	530
			35	17	54	140	290	530
			40	17	54	140	290	530
			45	17	54	140	290	530
			50	17	54	140	290	530
			60	15	46	135	280	490
			70	14	44	125	270	450
急停力矩 T_{2NOT} Emergency Stop Torque	N·m			3.0倍额定输出力矩 (3.0 times of Nominal Output Torque) (*最大输出力矩 Max.Output Torque T_{2B} =60% of Emergency Stop Torque)				
额定输入转速 n_{1N} Nominal Input Speed	rpm	1.2	3-100	5000	5000	4000	4000	3000
最大输入转速 n_{1max} Max.Input Speed	rpm	1.2	3-100	10000	10000	8000	8000	6000
超精密背隙 Ultraprecise Backlash P_0	arcmin	1	3-10	-	-	≤3	≤2	≤2
精密背隙 Precise Backlash P_1	arcmin	2	12-100	-	-	≤5	≤4	≤4
标准背隙 Standard Backlash P_2	arcmin	1	3-10	≤5	≤5	≤5	≤4	≤4
扭转刚性 Torsional Rigidity	N·m /arcmin	2	12-100	≤7	≤7	≤7	≤7	≤7
①容许径向力 F_{2rB} Max.Radial Load	N	1	3-10	≤7	≤7	≤7	≤6	≤6
①容许轴向力 F_{2aB} Max.Axial Load	N	2	12-100	≤9	≤9	≤9	≤9	≤9
使用温度 Operating Temp.	°C		3-100	-10°C ~ +90°C				
使用寿命 Service Life	hr		3-100	20,000(10,000/连续运转 Continuous operation)				
效率 Efficiency	%	1	3-10	≥95%				
重量 Weight	kg	2	12-100	≥92%				
安装方向 Mounting Position	-	1	3-10	1.0	2.6	6.8	13.5	25.1
②噪音值 Noise Level	dBA/1m	2	12-100	1.4	3.3	8.9	18.0	30.2
防护等级 Protection Class	-	1.2	3-100	任意方向 Any direction				
润滑 Lubrication	-	1.2	3-100	62	64	66	68	70
全合成润滑油脂 Synthetic Lubricant								
减速机转动惯量 Inertia (J1)								
节数 Stage	减速比 Ratio	单位 unit	PHZ-42	PHZ-60	PHZ-90	PHZ-115	PHZ-142	
1	3/4/5/7/9	kg·cm²	0.06	0.40	2.28	6.87	24.2	
	6/8/10/14/20		0.05	0.30	1.45	4.76	14.5	
节数 Stage	减速比 Ratio	kg·cm²	PHZ-42	PHZ-60	PHZ-90	PHZ-115	PHZ-142	
2	15/20/25/35/45		0.06	0.40	2.28	3.02	7.83	
	others		0.05	0.30	1.45	1.64	5.00	

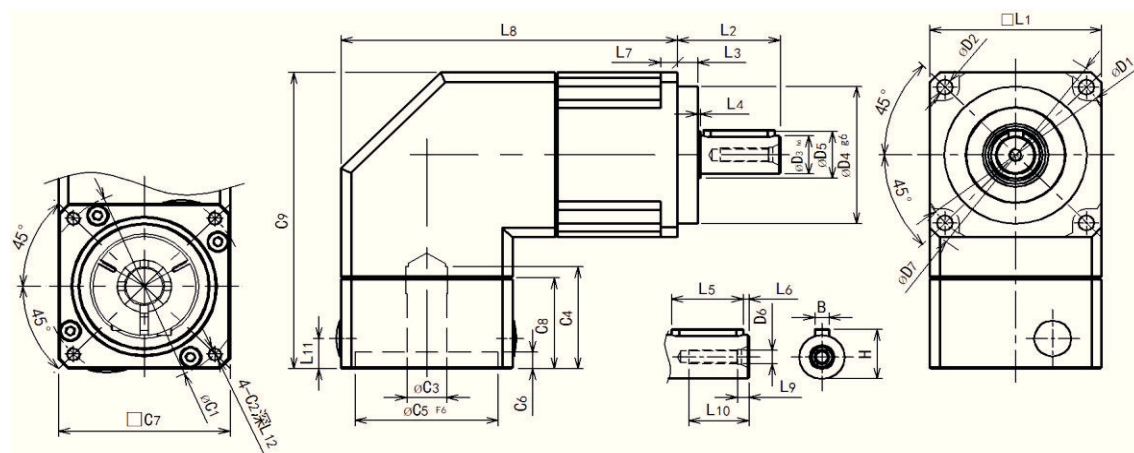
①输出转速100rpm时，作用于输出轴中心位置 Applied to the output shaft center @100rpm. ②3000rpm空载量测 Measured at 3000rpm with no load.

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Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



PSZ单段外型尺寸图 PSZ Single Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PSZ42	PSZ60	PSZ90	PSZ115	PSZ142
D1	50	70	100	130	165
D2	3.4	5.5	6.5	8.5	10.5
D3 _{h6}	13	16	22	32	40
D4 _{g6}	35	50	80	110	130
D5	15	25	35	45	50
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P
D7	56	80	118	148	186
L1	42.6	60	90	115	142
L2	26	37	48	62	93
L3	5.5	7	10	8	8
L4	1.5	1.5	1.5	3	6
L5	15	25	32	40	60
L6	2	2	3	5	5
L7	4	6	8	12	18
L8	103.6	148.7	204	244.5	330
L9	4	4	4.5	6	6
L10	14	16.5	20.5	30	38
L11	11.5	11.5	13	16	20.3
L12	15	20	20	30	30
C1 ²	46	70	90	115	145
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P
C3 ²	≤8	≤14	≤19/≤24	≤24	≤35
C4 ²	29	34	44	53	75
C5 ² _{F6}	30	50	70	95	110
C6 ²	6	5	5	6	9
C7 ²	42.6	60	90	115	140
C8 ²	25	33	35	48	65
C9 ²	70.8	107.8	135	174.5	207
B	5	5	6	10	12
H	15	18	24.5	35	43

※C1 ~ C9是公制标准马达连接板尺寸，请依所选用的马达决定。

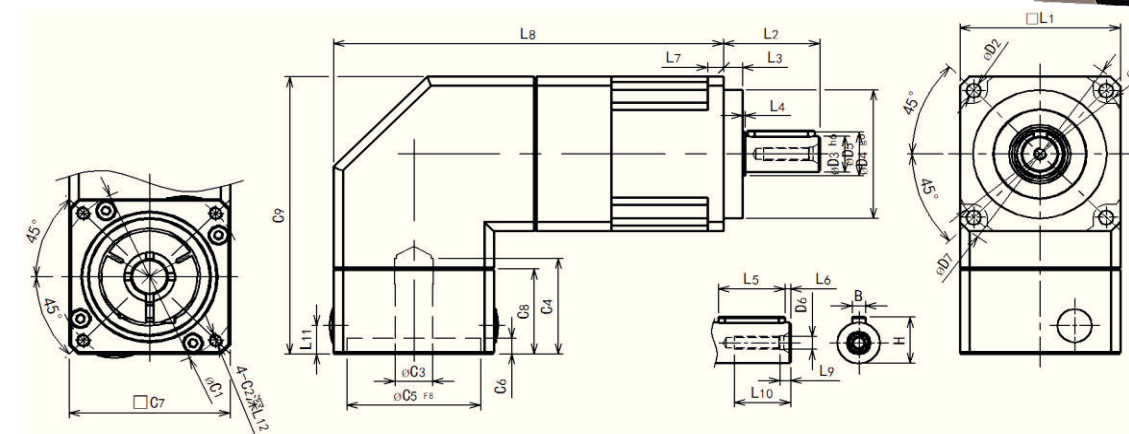
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※C1 ~ C9 are motor specific dimensions(metric std shown).

Size may vary according to motor flange chosen.

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PSZ双段外型尺寸图 PSZ Double Stage Dimensions



规格 (Specifications) : Unit : mm

尺寸 Dimensions	PSZ42	PSZ60	PSZ90	PSZ115	PSZ142
D1	50	70	100	130	165
D2	3.4	5.5	6.5	8.5	10.5
D3 _{h6}	13	16	22	32	40
D4 _{g6}	35	50	80	110	130
D5	15	25	35	45	50
D6	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2.0P
D7	56	80	118	148	186
L1	42.6	60	90	115	142
L2	26	37	48	62	93
L3	5.5	7	10	8	8
L4	1.5	1.5	1.5	3	6
L5	15	25	32	40	60
L6	2	2	3	5	5
L7	4	6	8	12	18
L8	129.6	176.7	244	292.5	391
L9	4	4	4.5	6	6
L10	14	16.5	20.5	30	38
L11	11.5	11.5	13	16	20.3
L12	15	20	20	30	30
C1 ²	46	70	90	115	145
C2 ²	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M8×1.25P
C3 ²	≤8	≤14	≤19/≤24	≤24	≤35
C4 ²	29	34	44	53	75
C5 ² _{F6}	30	50	70	95	110
C6 ²	6	5	5	6	9
C7 ²	42.6	60	90	115	140
C8 ²	25	33	35	48	65
C9 ²	70.8	107.8	135	174.5	207
B	5	5	6	10	12
H	15	18	24.5	35	43

※C1 ~ C9是公制标准马达连接板尺寸，请依所选用的马达决定。

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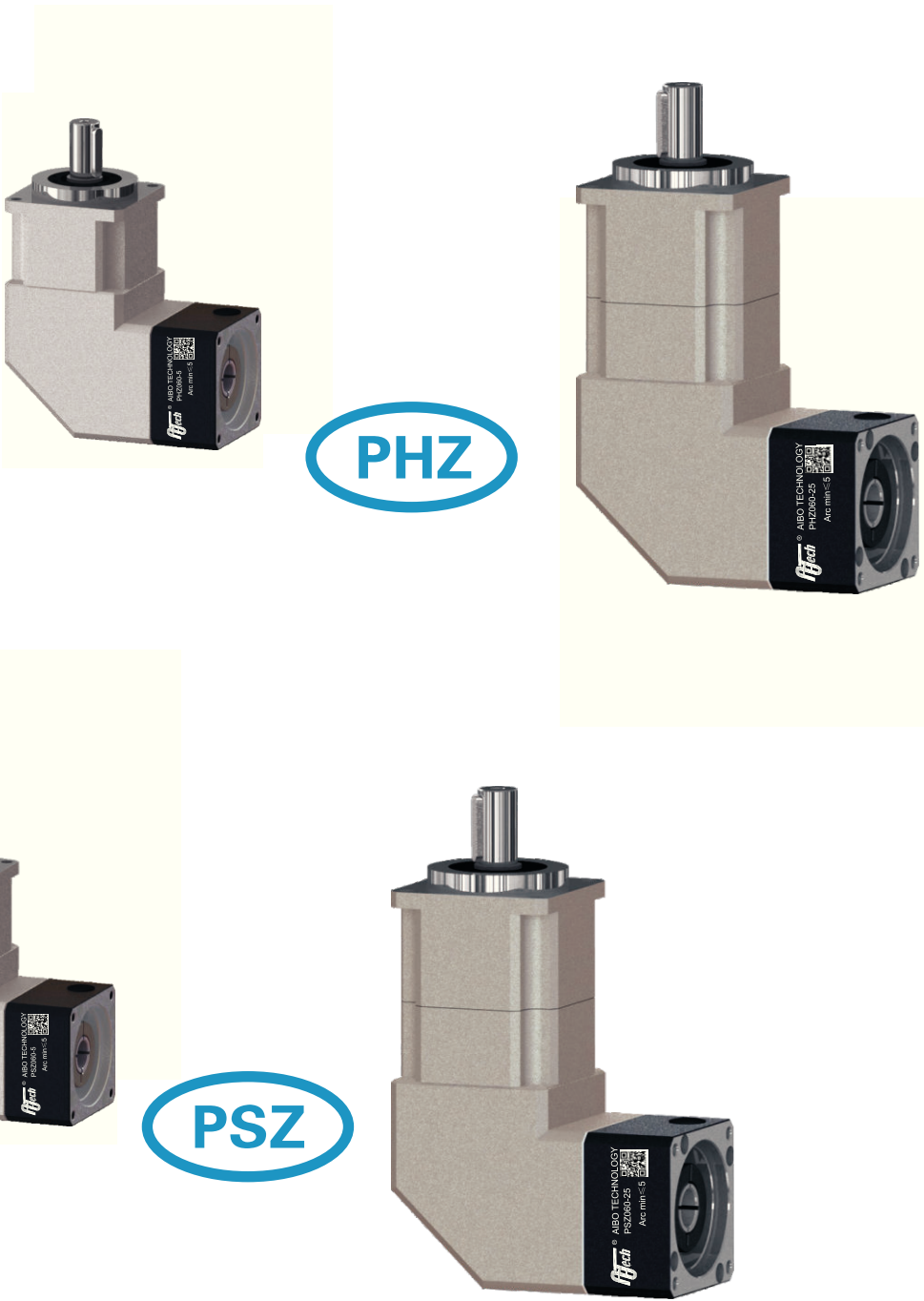
Size may vary according to motor flange chosen.

※Specification subject to change without notice.

PSZ 性能规格共表 Specifications Table

规格 Specifications			节数 Stage	减速比 Ratio	PSZ-42	PSZ-60	PSZ-90	PSZ-115	PSZ-142
额定输出力矩 T_{2N} Nominal Output Torque		N·m	1	3	13.8	44.2	95.2	283	482
				4	11.9	35.9	74.6	249	490
				5	13.8	43.0	95.2	283	473
				6	12.5	39.4	90.9	266	436
				7	11.9	36.0	85.6	219	400
				8	10.9	32.4	85.0	216	363
				9	9.8	28.7	85.0	210	320
			10	10.1	25.0	75.0	210	320	
			2	15	13.8	44.2	95.2	283	482
				20	11.9	35.9	74.6	249	490
				25	13.8	43.0	95.2	283	473
				30	13.8	43.0	95.2	283	473
				35	13.8	43.0	95.2	283	473
				40	13.8	43.0	95.2	283	473
		45		13.8	43.0	95.2	283	473	
		50	13.8	43.0	95.2	283	473		
		60	12.5	39.4	90.9	266	436		
		70	11.9	36.0	85.6	219	400		
		80	10.9	32.4	85.0	216	363		
		90	9.8	28.7	80.0	210	320		
		100	10.1	25.0	75.0	210	320		
急停力矩 T_{2NOT} Emergency Stop Torque	N·m	3.0倍额定输出力矩 (3.0 times of Nominal Output Torque) (*最大输出力矩 Max.Output Torque T_{2B} =60% of Emergency Stop Torque)							
额定输入转速 n_{1N} Nominal Input Speed	rpm	1.2	3-100	3000	3000	3000	2500	2000	
最大输入转速 n_{1max} Max.Input Speed	rpm	1.2	3-100	6000	6000	6000	5000	4000	
超精密背隙 Ultraprecise Backlash P_0	arcmin	1	3-10	-	-	-	≤4	≤4	
		2	12-100	-	-	-	≤6	≤6	
精密背隙 Precise Backlash P_1	arcmin	1	3-10	-	-	≤6	≤6	≤6	
		2	12-100	-	-	≤9	≤8	≤8	
标准背隙 Standard Backlash P_2	arcmin	1	3-10	≤12	≤9	≤9	≤9	≤9	
		2	12-100	≤15	≤12	≤12	≤11	≤11	
扭转刚性 Torsional Rigidity	N·m/arcmin	1.2	3-100	1.0	2.8	7.5	15.5	30	
①容许径向力 F_{2rB} Max.Radial Load	N	1.2	3-100	350	960	1630	3380	6150	
①容许轴向力 F_{2aB} Max.Axial Load	N	1.2	3-100	320	900	1420	2930	5510	
使用温度 Operating Temp.	℃		3-100	-10℃ ~ +90℃					
使用寿命 Service Life	hr		3-100	20,000(10,000/连续运转 Continuous operation)					
效率 Efficiency	%	1	3-10	≥94%					
		2	12-100	≥90%					
重量 Weight	kg	1	3-10	1.0	2.5	6.5	13.2	24.6	
		2	12-100	1.3	3.2	8.6	17.7	29.7	
安装方向 Mounting Position	-	1.2	3-100	任意方向 Any direction					
②噪音值 Noise Level	dBA/1m	1.2	3-100	65	67	70	70	75	
防护等级 Protection Class	-	1.2	3-100	Ip65					
润滑 Lubrication	-	1.2	3-100	全合成润滑油脂 Synthetic Lubricant					
减速机转动惯量 Inertia (J1)									
节数 Stage	减速比 Ratio	单位 unit		PSZ-42	PSZ-60	PSZ-90	PSZ-115	PSZ-142	
1	3/4/5/7/9	kg.cm²		0.06	0.40	2.28	6.87	24.2	
	6/8/10			0.05	0.30	1.45	4.76	14.5	
节数 Stage	减速比 Ratio			PSZ-42	PSZ-60	PSZ-90	PSZ-115	PSZ-142	
2	15/20/25/35/45			0.06	0.40	2.28	6.87	24.2	
	others			0.05	0.30	1.45	4.76	14.5	
①输出转速100rpm时，作用于输出轴中心位置 Applied to the output shaft center@100rpm. ②3000rpm空载量测 Measured at 3000rpm with no load.									
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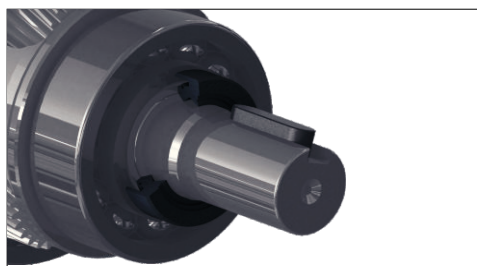
PHA系列 产品特点

PHA SERIES FEATURES



行星固定架及出力轴设计一体成型。且前后培林设定位置为大跨距，可达到最大扭转刚性及出力轴高径向负载能力。

Planetary arm bracket and output shaft are one-piece constructed, setting bearing apart for larger span to reach the largest reverse rigid and contribute high axis radial load capacity.



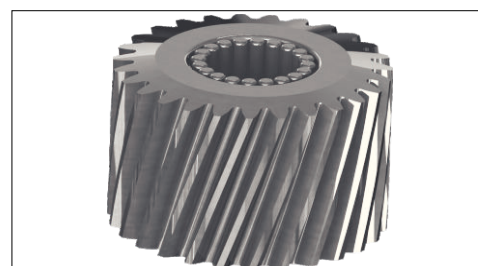
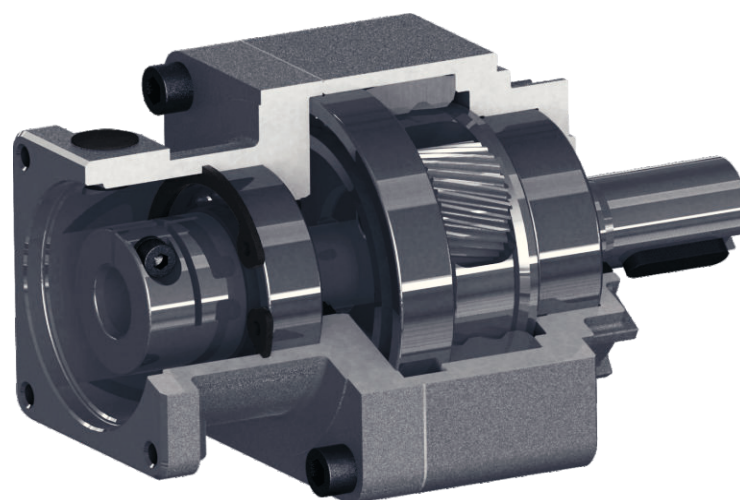
出力轴表面为研磨光面处理Ra 0.2μm。与油封搭配确保最低摩擦系数相对减少启动负载。保持最佳密封性，延长使用寿命。

Grinding process Ra 0.2μm to smooth surface of output shaft, and with oil-seal to minimum friction coefficient and reducing start up load; result in the best seal-ability and extended lifespan.



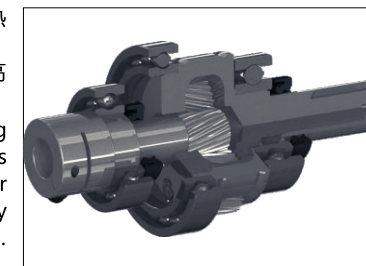
本体独家采用最新高科技材料，齿箱与内环齿毛坯嵌入铆压，再经日本三菱顶级插齿机加工。具有高精密度，高扭力，耐磨耗等特点。先进无电解镍表面处理，耐刮，耐腐蚀。最适合高科技设备严苛要求。

RD use exclusively the latest high-tech materials. The gear box and internal gear are one-piece constructed, and then processed with Mitsubishi Japan gear shaper machinery for high-precision, high torque and abrasion consumption. Advanced electroless nickel surface treatment, scratch resistance, corrosion resistance, are the most suitable for strict requirements of the high-tech equipment.



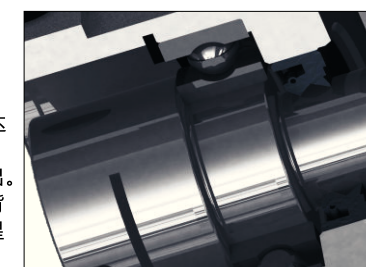
齿轮材质选用高级合金钢，独特真空渗碳及热处理至最佳硬度。兼具表面硬度及心部韧性，并经过齿形研磨加工，以获得最佳的精度、高耐磨耗及高耐冲击韧性。

Alloy steel gear with unique vacuum carburizing and heat treatment for the best surface hardness and inner core tenacity. Additionally, with gear grinding processing to get the best accuracy high wear resistance and high impact toughness.



太阳齿与行星固定架整体结构设计，确保传动元件的同轴度及传动的平稳性。

The sun gear and the planet frame structure design, ensure Stationary concentric drive element and transmission.

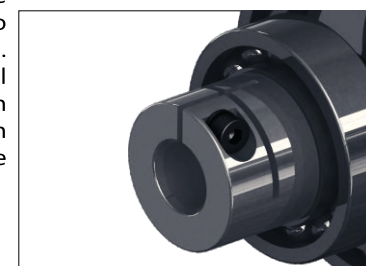


采用与世界知名品牌同款润滑油，搭配高科技油封设计，上唇为防尘唇，下唇为防油唇，采用IP65防护等级的密封设计，不泄漏，永久免保养。

High-tech oil seal design on the upper lip guard against dust intruder, lower lip to guard against oil leak. Protection grade Ip65 safeguards fully avoid leaking problem, and given it maintenance-free.

PHA系列采用螺旋齿轮设计，提升齿形契合率达30%以上，特殊螺旋角设计，可降低轴向推力、容许伺服马达高转速的输入，达到最大扭力输出。精密齿轮设计及专业齿轮加工，制造出低运转背隙、高效率、运转平顺、低噪音及长寿命的行星减速机。

PHA series helical gear design, enhance tooth engagement rate of 30% or more, special helix design, which reduces the axial thrust, allowing high speed servo motor input, maximum torque output. Precision gear design and professional gear processing create a low backlash operation, high efficiency, smooth running, low noise and long life of the planetary gear.



输入端与马达入力轴连接方法采用栓紧式机构，锁紧环经过动平衡分析，确保高转速下结合界面的同心度及零滑差动力传递。Input-end and motor shaft are combined through a dynamic balanced collar clamping to ensure connection interface concentricity and zero slip power transmission at high speed.



先进马达连接板设计，配合轴套，安装容易，可与各种厂牌之伺服、步进马达完美搭配组合。

Advanced motor connecting plate design are combined with the shaft sleeve, installation Easily, with various brands of servo or stepper motor.

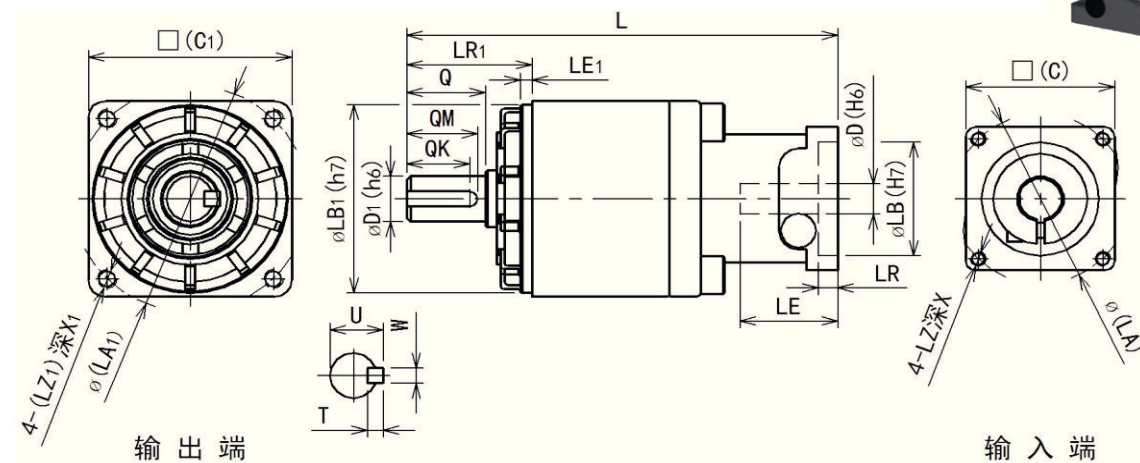
行星齿轮传动界面采用针状轴承，满针排列不含保持器，以达到最大接触面积最小间隙公差，提高结构刚性及输出扭力。

Planet gear transmission interface equipped with needle bearings, full needle roller bearings aligned without retainer achieve maximum exposure but smallest gap tolerances. Enhance over-all gear structure rigid and output torque.

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PHA单段外型尺寸图 PHA Single Stage Dimensions



●PHA同芯轴型减速机尺寸表

(Dimensional Table For PHA Concentric Shaft Reducer)

单位(Unit):mm

尺寸 Dimensions		PHA052				PHA078				PHA098								PHA125											
输出轴	LR1	32				50				61								75											
	ø(D1)	12				19				24								32											
	Q	20				30				40								55											
	QM	18				26				35								52											
	QK	16				23				30								45											
	U	13.5				21.5				27								35											
	W	4				6				8								10											
	T	4				6				7								8											
输出法兰	□(C1)	52				78				98								125											
	ø(LB1)	50				70				90								110											
	LE1	3				3				5								5											
	ø(LA1)	60				90				115								135											
	LZ1	M5.0				M6.0				M8.0								M10.0											
	X1	12				20				20								20											
输入端	□(C)	38	40	40	60	38	40	60	60	80	80	38	40	60	60	80	80	90	100	60	60	80	80	90	100	100	120	130	130
	ø(LB)	30	30	30	50	30	30	50	50	70	70	30	30	50	50	70	70	80	95	50	50	70	70	80	95	95	110	110	110
	ø(LA)	45	46	46	70	45	46	70	70	90	90	45	46	70	70	90	90	100	115	70	70	90	90	100	115	115	130	145	145
	ø(D)	8	6	8	14	8	6	11	14	16	19	8	8	11	14	16	19	19	19	11	14	16	19	19	19	24	22	24	28
	LZ	M3.0/M4.0/M5.0				M3.0/M4.0/M5.0/M6.0				M3.0/M4.0/M5.0/M6.0/M8.0								M4.0/M5.0/M6.0/M8.0											
	X	10-15				10-15				15-20								15-20											
	LR	3.5				4.0				4.0								6.0											
	LE	25				32.5				40								56											
全长(L)		100-110				140-150				158-177								210-235											

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● PHA减速机性能规格共表 (Specifications Table)

规格 Specifications		节数 Stage	减速比 Ratio	PHA052	PHA078	PHA098	PHA125
额定输出扭矩 T_{2N} Rated Output Torque	N·m	1	3	3.43	6.86	18.30	44.10
			5	2.84	11.50	23.50	56.80
			9	2.35	9.70	18.20	73.50
		2	15	4.02	16.20	30.40	91.40
			20	5.00	21.10	40.60	78.40
			25	6.27	26.40	50.70	65.40
			35	3.84	15.50	37.00	71.00
			45	-	9.50	28.30	91.30
			81	-	9.70	17.80	43.30
紧急停止扭矩 T_{2NOT} Emergency Stop Torque	N·m	3.0倍额定输出扭矩 (3.0times of Nominal Output Torque) (※最大输出扭矩Max.Output Torque T2B=60% of Emergency Stop Torque)					
额定输入转速 n_{1N} Nominal Input Speed	rpm	1,2	3-100	3000	3000	3000	3000
最大输入转速 n_{1max} Max.Input Speed	rpm	1,2	3-100	5000	5000	5000	5000
超精密背隙 Ultraprecise Backlash P_0	arcmin	1	3-10	≦3	≦3	≦3	≦2
	2	12-100	≦5	≦5	≦5	≦4	
精密背隙 Precise Backlash P_1	arcmin	1	3-10	≦6	≦6	≦6	≦5
	2	12-100	≦8	≦8	≦8	≦7	
标准背隙 Standard Backlash P_2	arcmin	1	3-10	≦12	≦9	≦9	≦7
	2	12-100	≦15	≦12	≦12	≦9	
扭转刚性 Torsional Rigidity	N·m /arcmin	1,2	3-100	1.0	2.8	7.5	15.5
①容许径向力 F_{2rB} Max.Radial Load	N	1,2	3-100	882	1670	2060	3530
①容许轴向力 F_{2aB} Max.Axial Load	N	1,2	3-100	441	833	1030	1765
使用温度 Operating Temp.	℃	1,2	3-100	-10℃ ~ +90℃			
使用寿命 Service Life	Hr	1,2	3-100	20,000 (10,000/连续运转 Continuous Operation)			
传动效率 Efficiency	%	1	3-10	≥97%			
		2	12-100	≥94%			
安装方向 mounting position	-	1	3-100	任意方向 Any Direction			
②噪音值 Noise Level	dBA/1m	1,2	3-100	58	60	62	65
防护等级Protection Grade	-	1,2	3-100	Ip65			
润滑油 Lubricant	-	1,2	3-100	合成润滑油脂 Synthetic Lubricant			
①输出转速100rpm时，作用于输出轴中心位置 Applied to the output shaft center@100rpm. ②3000rpm空载量测Measured at 3000rpm with no load.							
※本公司有权对以上数据规格进行设计变更不先告知。The above figures/specifications are subject to change without prior notice.							

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● PHA性能参数规格表-1 PHA performance specifications in table -1

减速比 Reduction ratio	额定参数 Rated Parameters		额定输入转速为3,000rpm时			
			额定输出扭矩 Rated Output Torque	输出轴转速 Output Shaft Speed	瞬间最大输出扭矩 Moment Maximum Output Torque	输入轴换算 内部惯性力矩 Internal Inertia Torque
	型号Model	电机输出功率 Motors Power	(N·m)	(rpm)	(N·m)	(×10 ⁻⁴ Kg·m²)
1/3	PHA052	50W	0.26	1000.0	0.78	0.0575
		100W	0.72		2.06	0.0575
		200W	1.47		4.51	0.1350
		400W	3.43		10.30	0.1450
	PHA078	750W	6.37		19.30	0.9130
		1000W	7.55		22.80	2.4300
		1500W	12.30		37.10	2.4300
		2000W	17.20		51.50	2.4300
	PHA125	2500W	19.00		57.20	5.5500
		3000W	23.70		71.20	5.5000
		3500W	28.30		85.20	5.5000
		4000W	33.10		99.00	5.7800
		4500W	37.70		113.00	5.7800
		5000W	42.90		128.00	5.7800
		50W	0.51		1.47	0.0400
	PHA052	100W	1.18		3.72	0.0400
		200W	2.65		8.04	0.1180
	PHA078	400W	5.39		16.20	0.3630
		750W	10.70		32.10	0.7130
1/5	PHA098	1000W	13.40	600.0	40.50	1.8500
		1500W	21.50		64.40	1.8500
		2000W	23.80		71.50	3.5000
		2500W	31.80		95.50	3.5000
	PHA125	3000W	39.60		119.00	3.4800
		3500W	47.20		141.00	3.4800
		4000W	55.30		166.00	3.7500
		50W	0.92		2.74	0.0350
	PHA052	100W	2.25		6.86	0.0350
		200W	3.72		11.30	0.2750
	PHA078	400W	9.51		28.50	0.2750
		750W	18.20		54.70	0.6500
1/9	PHA098	1000W	20.00	333.0	60.10	2.8090
		1500W	34.30		103.00	2.8090
		2000W	48.60		146.00	2.8090
		2500W	60.80		182.00	2.8090
	PHA125	3000W	73.00		219.00	2.7670
		50W	1.67		5.00	0.0350
		100W	3.72		14.40	0.0350
	PHA078	200W	6.27		18.80	0.3000
		400W	15.80		47.50	0.3000
1/15	PHA098	750W	30.40	200.0	91.20	0.7000
		1000W	33.30		100.00	1.9500
		1500W	57.20		172.00	2.8000
		2000W	81.00		243.00	2.8000
1/20	PHA052	50W	2.21		6.63	0.0340
		100W	5.00		15.00	0.0340
	PHA078	200W	8.69		26.10	0.2940
		400W	21.10		63.30	0.2940
1/25	PHA052	50W	2.74	120.0	8.33	0.0325
		100W	6.27		19.00	0.0325
	PHA078	200W	11.10		33.30	0.2880
		400W	26.40		79.20	0.2880
1/35	PHA098	750W	50.70		152.00	0.6800
		1000W	55.70		167.00	1.8800
	PHA052	50W	3.84		11.50	0.0300
		100W	7.24		21.70	0.0600
1/45	PHA078	200W	15.50		46.60	0.2620
		400W	37.00		111.00	0.2690
	PHA125	750W	71.00		213.00	0.4730
		50W	3.86		11.60	0.0285
1/81	PHA078	100W	9.31	66.0	28.00	0.0285
		200W	21.10		63.50	0.0256
	PHA125	400W	47.50		142.50	0.2450
		750W	91.30		274.00	1.7740
1/81	PHA078	50W	7.02		20.80	0.0270
		100W	14.00		42.00	0.0300
	PHA125	200W	36.10		108.30	0.2400

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● PHA性能参数规格表-2 PHA performance specifications in table -2

减速比 Reduction ratio	额定参数 Rated Parameters		额定输入转速为2,000rpm时			
			额定输出扭矩 Rated Output Torque	输出轴转速 Output Shaft Speed	瞬间最大输出扭矩 Moment Maximum Output Torque	输入轴换算 内部惯性力矩 Internal Inertia Torque
	型号Model	电机输出功率 Motors Power	(N·m)	(rpm)	(N·m)	(×10 ⁻⁴ Kg·m²)
1/3	PHA052	50W	0.477	666.0	1.43	0.0575
		100W	1.050		3.15	0.1350
		200W	2.480		7.45	0.1450
	PHA078	400W	5.010		15.00	0.9130
		750W	8.730		26.20	2.4300
	PHA098	1000W	12.300		37.10	2.4300
		1500W	18.300		54.90	2.4300
	PHA125	2000W	23.700		71.20	5.5000
		2500W	30.800		92.50	5.5000
		3000W	37.700		113.00	5.5000
		3500W	44.100		132.00	5.7800
1/5	PHA052	50W	0.795	400.0	2.39	0.0400
		100W	1.570		4.70	0.1180
	PHA078	200W	3.820		11.50	0.3630
		400W	8.350		25.10	0.7130
	PHA098	750W	15.500		46.50	1.8500
		1000W	21.500		64.40	1.8500
	PHA125	1500W	27.800		83.50	3.5000
		2000W	39.600		119.00	3.4800
		2500W	51.400		154.00	3.7500
1/9	PHA052	50W	1.570	222.0	4.72	0.0350
		100W	2.350		7.04	0.2750
	PHA078	200W	6.640		19.90	0.2750
		400W	14.000		41.90	0.6500
	PHA125	750W	23.600		70.90	2.8100
		1000W	34.300		103.00	2.8100
		1500W	53.700		161.00	2.8100
		2000W	73.000		219.00	2.7700
1/15	PHA052	50W	2.620	133.0	7.87	0.0350
		100W	3.910		11.70	0.3000
	PHA078	200W	11.100		33.20	0.3000
		400W	23.300		69.80	0.7000
	PHA125	750W	39.400		118.00	2.8000
		1000W	57.200		172.00	2.8000
		1500W	91.300		274.00	2.8000
1/20	PHA052	50W	3.500	100.0	10.50	0.0340
		100W	5.730		17.20	0.2940
	PHA078	200W	14.800		44.40	0.2940
		400W	31.000		93.10	0.6900
1/25	PHA052	50W	4.370		13.10	0.3250
		100W	7.160		21.50	0.2880
	PHA078	200W	18.500		55.40	0.2880
		400W	38.800		116.00	0.6800
1/35	PHA125	750W	65.400		196.00	1.8800
		50W	4.430	57.0	13.30	0.2620
	PHA078	100W	12.700		38.10	0.2620
		200W	22.000		66.00	0.2690
1/45	PHA052	50W	5.800			
		100W	14.000		17.40	0.0285
	PHA098	200W	28.300		42.10	0.0285
					85.20	0.0285
1/81	PHA078	50W	9.700	24.6	29.20	0.0270
		100W	17.800		53.50	0.0300

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非标产品展示

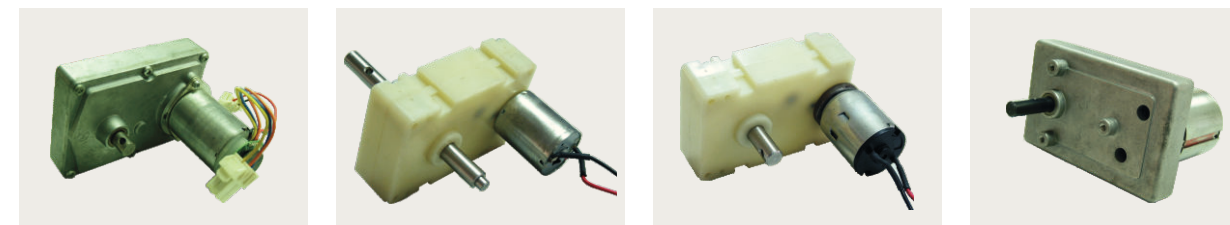
智能家居、智能卫浴类



办公用品、电动工具类



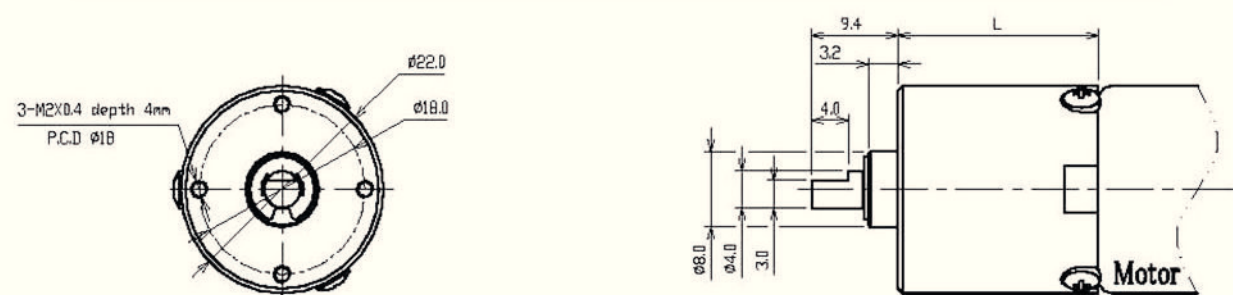
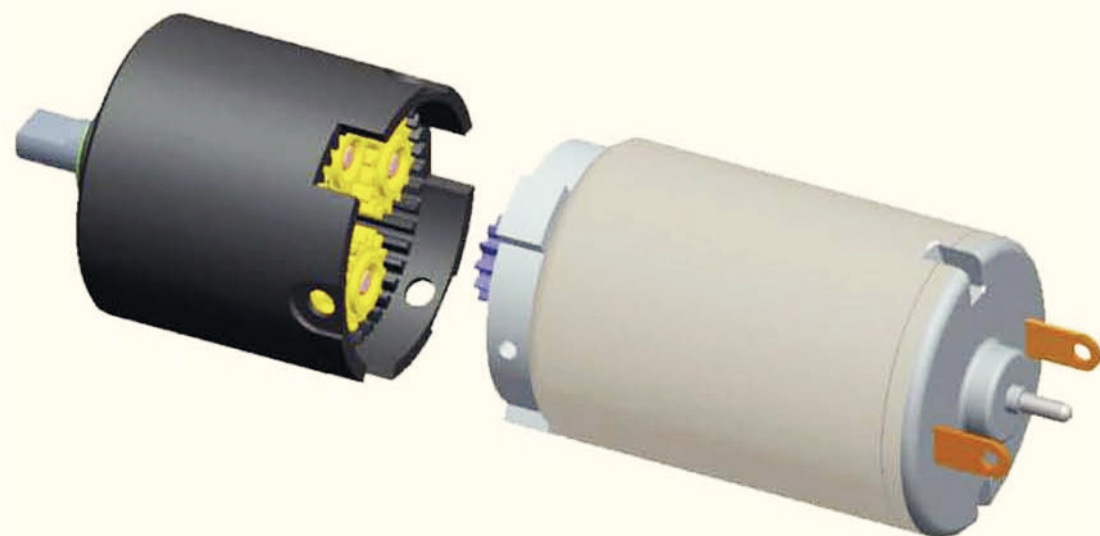
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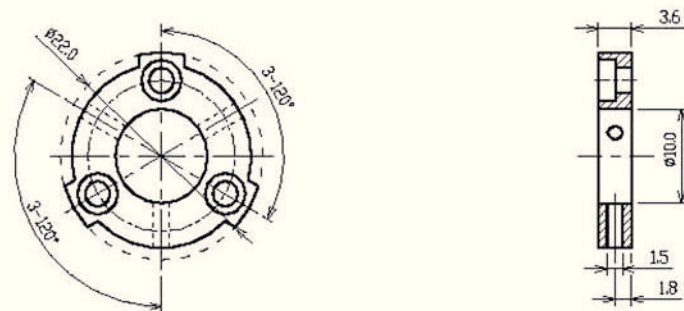
收银、ATM类



非标产品-22系列

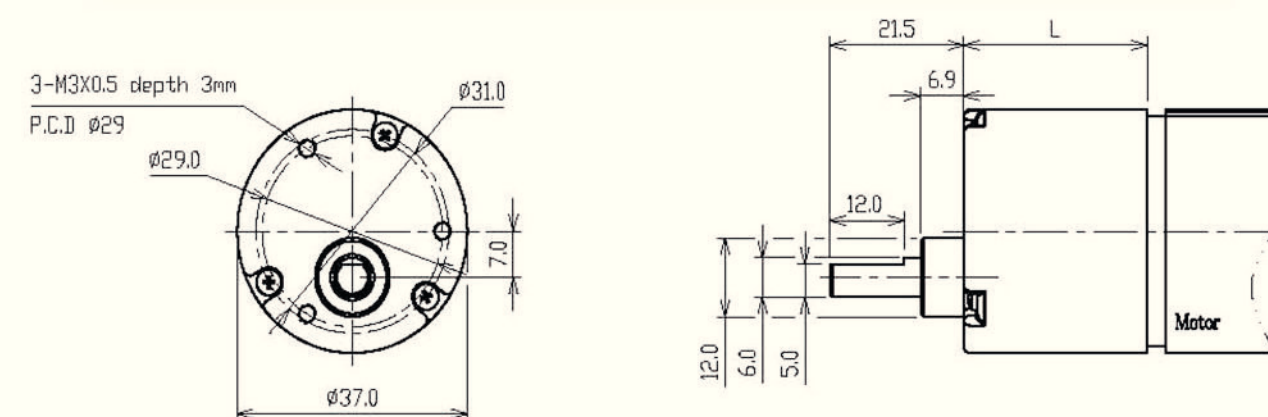
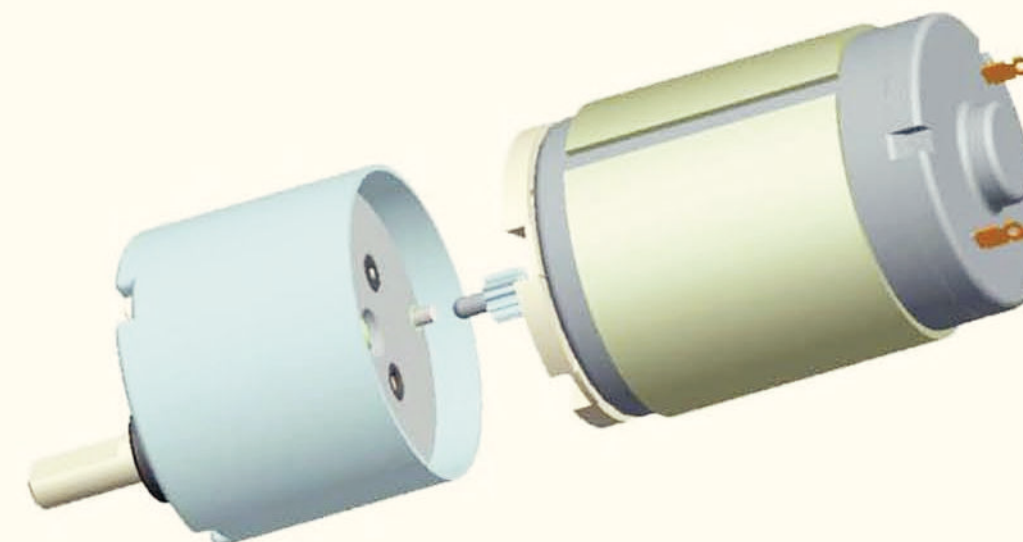


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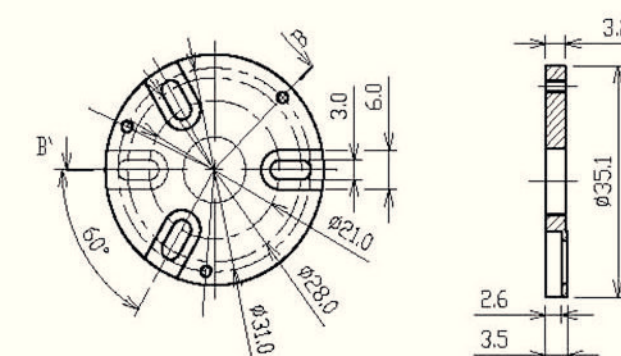


马达间座

非标产品-37系列

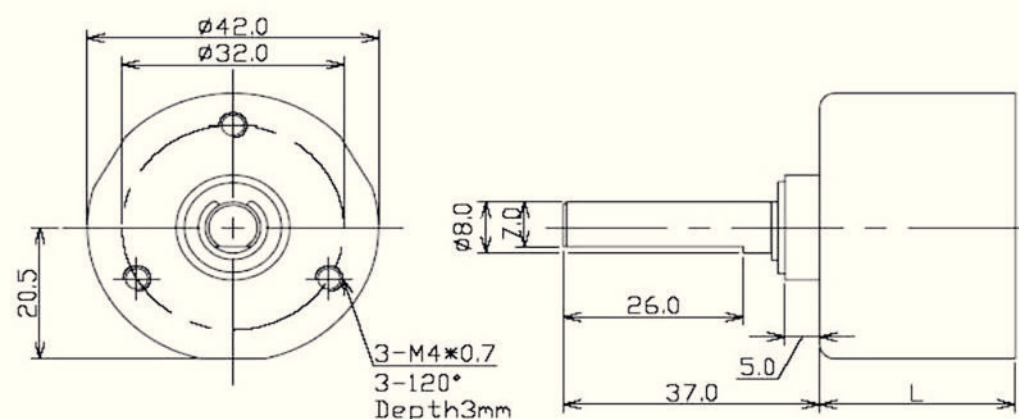
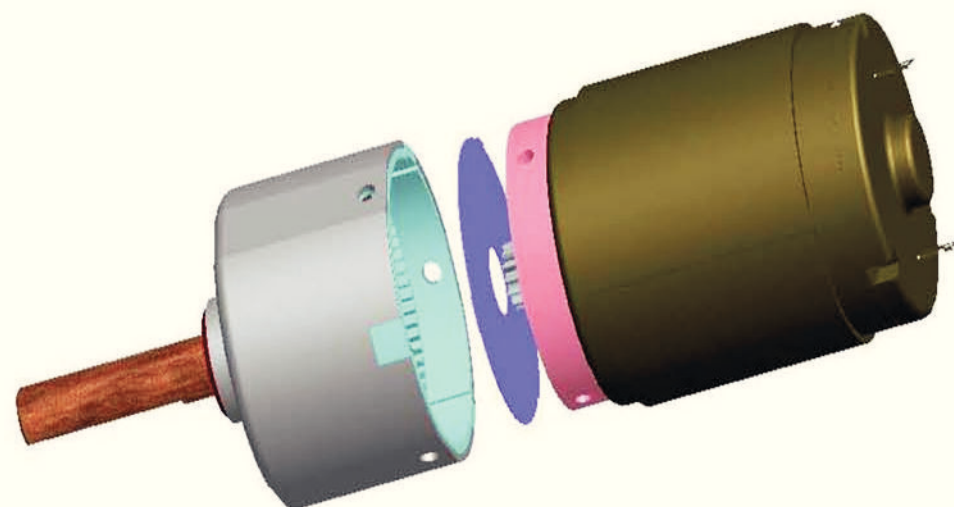


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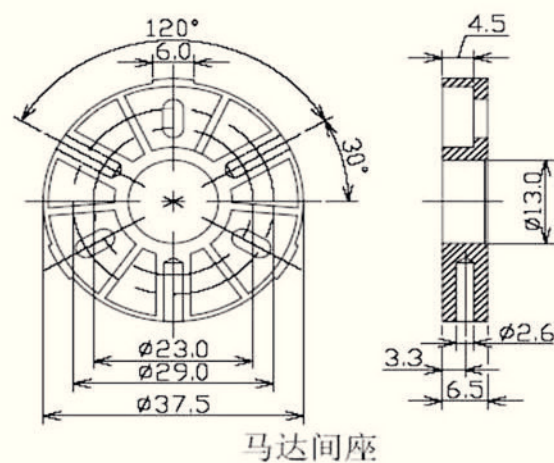


马达间座

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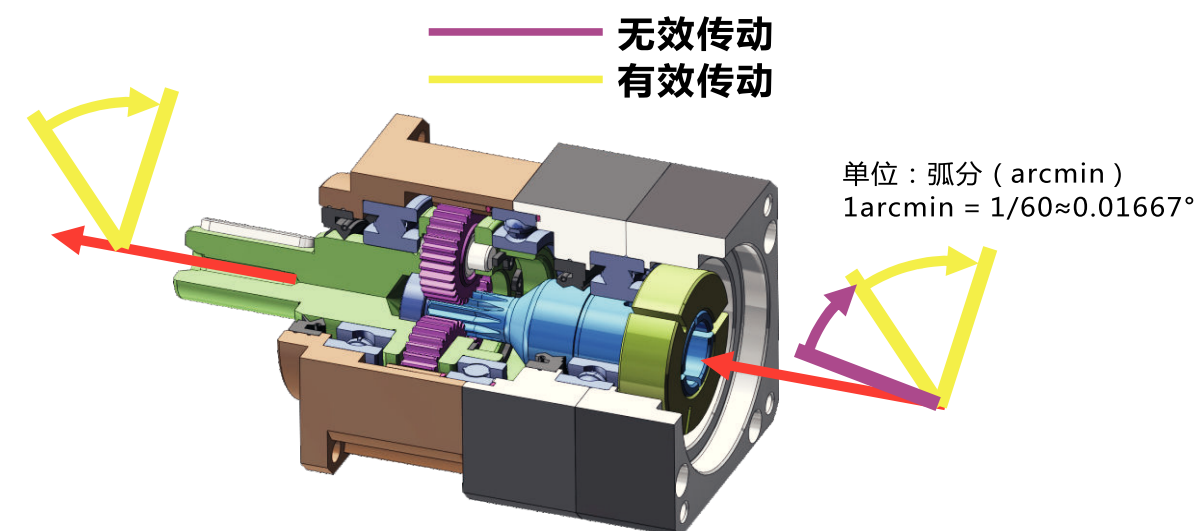


减速部



马达间座

行星减速机背隙定义说明



背隙：也叫回程间隙，是指减速机输出轴与输入端的最大偏差角。测量时将输入端固定，输出端顺时针和逆时针方向产生额定扭矩±2%扭矩旋转时，减速机输入端会有一个微小的角位移，此角位移就是回程间隙（即背隙）。单位是“弧分（arcmin）”。

背隙↗，输入端/输出端传动误差↗，传动精度↘。

背隙↘，输入端/输出端传动误差↘，传动精度↗。

行星减速机的基本构造

