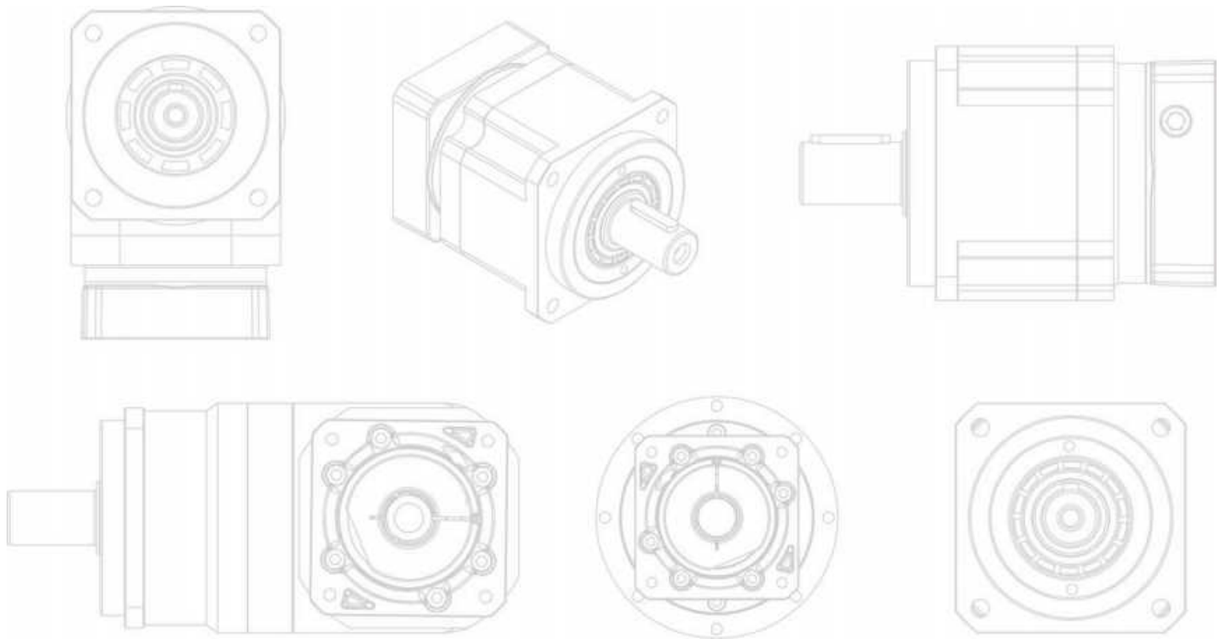
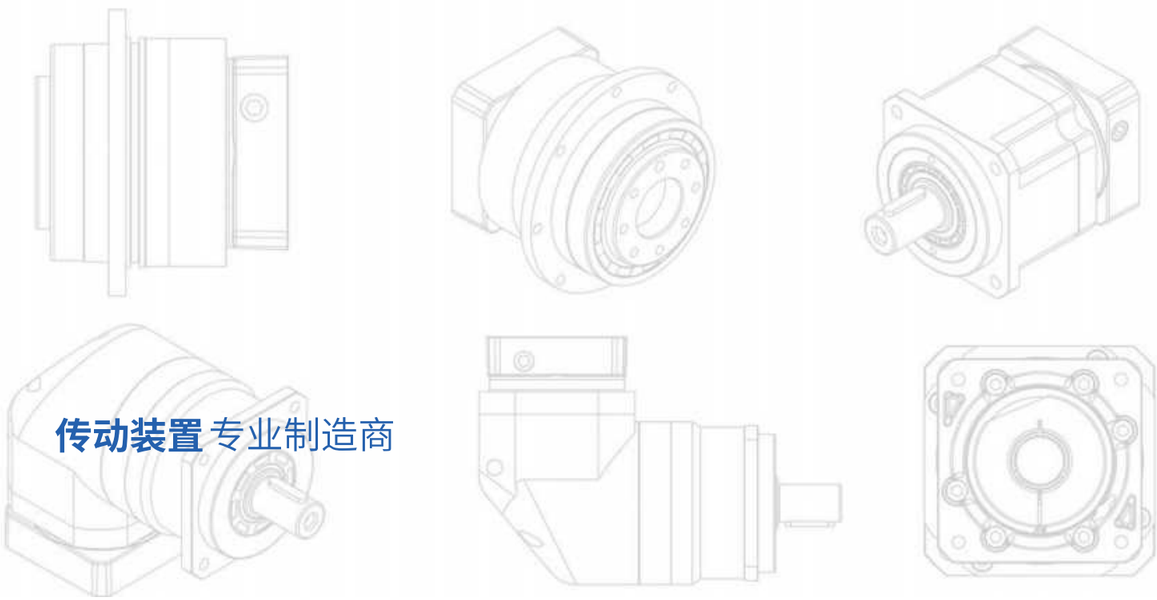


传承之道 稳行致远

CHBNS 精密行星



传动装置 专业制造商

浙江侨邦精密电机有限公司

地址：浙江省丽水市江南路785号
网址：www.chbns.com

随着传动技术的高速发展

全球范围内的传统传动设备发生了翻天覆地的重大变革

传动产品也迎来全新的机遇

特别是智能化技术的应用和普及也为其注入了新鲜的血液

使得整体行业的生命力更加旺盛

行星减速机正在转变

.....

侨邦也在改变

.....

With the rapid development of transmission technology

Traditional transmission equipment has undergone a significant transformation worldwide

Transmission products also welcome new opportunities

Especially the application and popularization of intelligent technology have injected fresh blood into it, making the

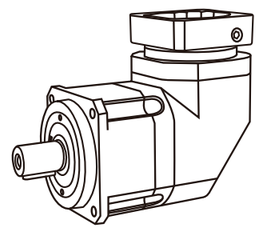
overall vitality of the industry even stronger

Planetary reducers are undergoing a transformation

.....

CHBNS is also changing

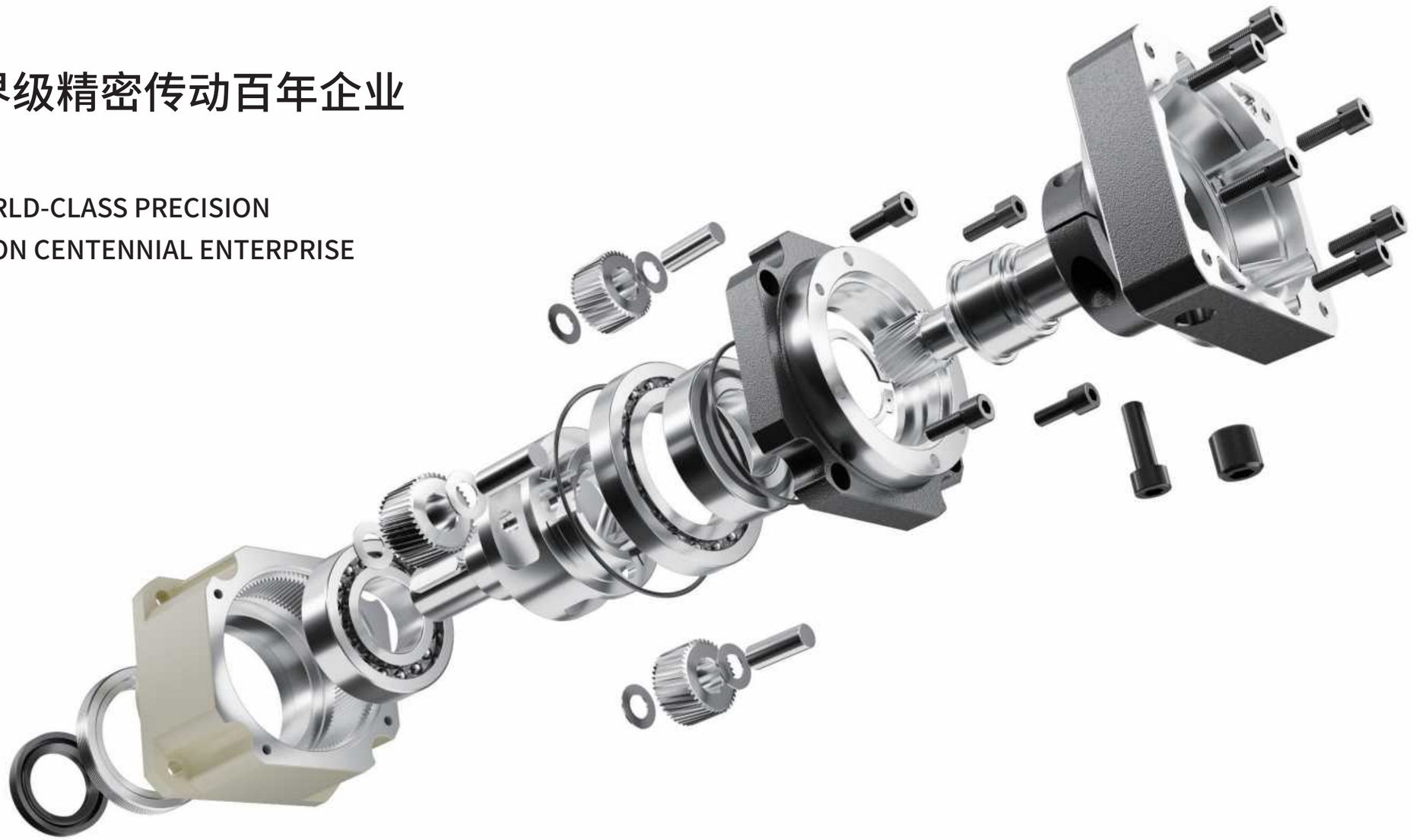
.....



愿景

成为世界级精密传动百年企业

BECOME WORLD-CLASS PRECISION
TRANSMISSION CENTENNIAL ENTERPRISE



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CHBNS 传承之道 稳行致远
传动装置专业制造商
PROFESSIONAL MANUFACTURER OF TRANSMISSION DEVICE
行星系列

产品概述 / PRODUCTS OVERVIEW

产品特点/products features

精密行星齿轮减速机是我公司自主研发的新一代实用性产品，融合了国内外先进的技术，具有以下一些主要特点:
1.低噪音: 低于65db。
2 低背隙: 单级可达1弧分内，双级可达3弧分内。
3.高效率: 单段式在95%以上，双段式在92%以上。
4.高输入转速: 可达8000RPM。
5.高扭矩: 比一般标准行星减速机扭矩高。
6.高稳定性: 采用高强度合金钢材，整颗齿轮经硬化处理，非只有表面硬化，确保使用寿命及长期使用仍保持最初的精密度。
7.高减速比: 采用模组化设计，行星齿箱可相互连结，速比可达1:1000以上。

Precision planetary gear reducer is a new-generation of product developed by our company,with a compromise of advanced technology both at home and abroad,its main features are as follows:
1.Low Noise: Under 65db.
2.Low Backlash: Single-stage≤1 arcmin; Dual-stage≤3 arcmin.
3.High Efficiency: Single-stage≥95%; Dual-stage≥92%.
4.High Input Speed: Up to 8000 RPM.
5.High Torque: High output torque density.
6.High Stability: Employs high tensile strength alloy steel.Gear hardening is made for the entire gear instead of only surface hardening,which extends gear service life and maintain high accuracy as new after a long period of operation.
7.High Speed Reduction Ratio：The gear reducer is a modular design. The planetary gear box can be connected. Speed reduction ratio is over 1:1000.

产品用途/Precision usage

精密行星齿轮减速机被广泛应用于以下领域：
1.航空航天、军事产业。
2.医疗卫生、电子信息技术产业。
3.工业机器人、生产自动化、数控机床制造产业。
4.汽车制造、纺织、印刷、食品、冶金、环保工程、仓储物流等产业。

Precision Planetary Gear Reducer is widely used in the following industnes.
1. Aerospace, military industry.
2. Medical health, electronic information industry.
3. Industrial robots, production automation, CNC manufacturing industry.
4. Motor, textile, printing, food, metallurgy, environmental engineering, warehouse logistics industry.

减速机的选用及注意事项 / GEAR BOX SELECTION & ANNOUNCEMENTS

行星减速机的选型/ Planetary reducer selection

选配行星减速机应该遵循适用性和经济性相结合的原则，就是说行星减速机的各项技术指标，既能满足设备的要求又能节约成本。“过”与“不及”都会带来成本浪费。选型不当是减速机出现故障的主要原因，因此正确选用行星减速机非常重要。

选用减速机应考虑其结构类型、承载能力、减速比、输出转速、轴向力、径向力、扭转刚性、背隙等内在性能指标，也应充分考虑安装形式、工况条件、工作环境等外部因素。为方便起见，请参考以下步骤，实现准确快速选型。

Step1：减速机规格的确定

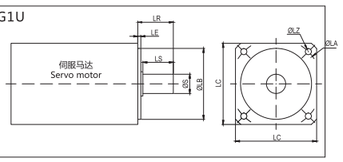
步骤	说明	代号	参数计算						
1	设备使用系数	f_1	Loading classification 负载类型	Running per hour 每小时启动次数Z	Using fs 使用系数fs Running per day(h) 每日运行时间（h）				
					h<4	4<h<8	8<h<12	12<h<16	16<h<24
			Uniform 均匀负载	Z<10	0.85	0.95	1.00	1.20	1.60
				10<Z<30	0.90	1.10	1.15	1.40	1.80
				30<Z<100	1.00	1.20	1.30	1.60	2.00
			Medium shock 中等冲击负载	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
			Heavy shock 重冲击负载	Z<10	1.20	1.45	1.60	2.00	2.40
				10<Z<30	1.30	1.55	1.75	2.20	2.50
				30<Z<100	1.40	1.65	1.90	2.40	2.80
2	扭矩的确定	T_{2N}	T_{2N}>T_{C2} 所选减速机的额定扭矩T_{2N}必须大于计算扭矩T_{C2} 。$T_{C2}=T_{r2}\times f_S$（T_{C2}-计算扭矩 T_{r2}-实际所需扭矩f_S-使用系数）						
3	额定输入转速	n_1	允许最大输出转速请参照减速机性能资料						
4	确定减速比	i	$i=n_1/n_2$						
5	减速机效率	η	L1≥95%、L2≥92%						
6	以被驱动设备所需的扭矩或功率，计算减速机的输入功率	P_1	$P_1=(T_{2N}\times n_1)/(9550\times i\times\eta)$ 或 $P_1=P_2\div\eta$						
7	根据计算传动力表确定减速机的规格	T_{2N}、P_{1N}	$T_{2N}\geq T_3\times f_1\times f_2$ $P_{1N}\geq P_1\times f_1\times f_2$						
8	输出轴径向力、轴向力校核	Fr、Fa	查《产品手册》性能资料表。对比应小于减速机最大径向力、轴向力。频繁起动-停止运转工况应选择加强型						
9	确认使用环境		防护等级、工作温度、化学环境等						
10	根据空间确认安装方式		同轴安装、90°直角安装						
11	确认减速机型号		根据性能资料表、输入、输出方式等确定具体系列、型号、规格及附件						

说明：n_1、P_2为被驱动设备的转速和功率；$P_1=P_2$为被驱动设备所需的功率和扭矩；P_{1N}、T_{2N}为实际减速机所需功率和扭矩。

Step2：确定电机。电机生产厂商、规格型号、性能指标及外形尺寸确定

马达型号 Motor Model:MHMD-082G1U

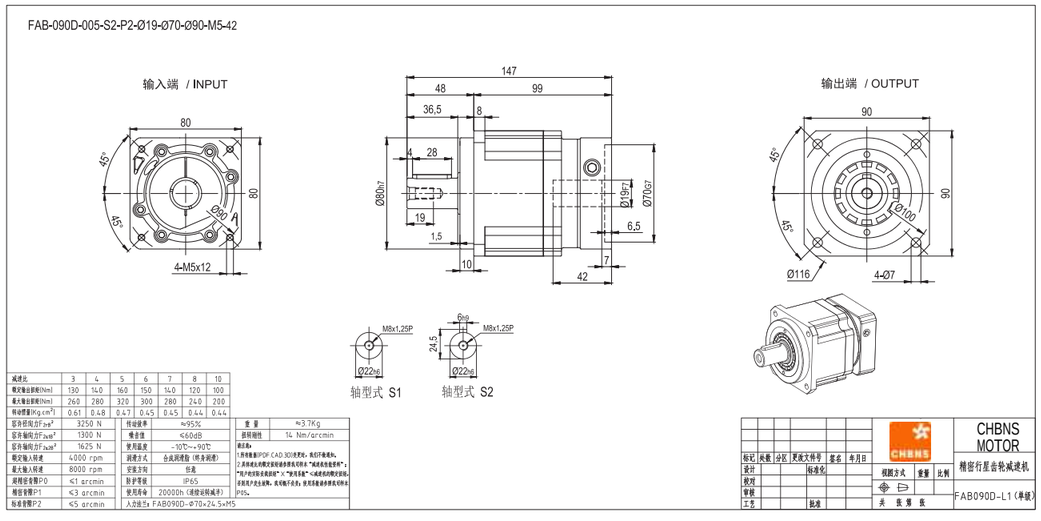
输出功率	Output	0.75	kw
额定力矩	Rated Torque	2.4	NM
最大力矩	Max.Torque	7.1	NM
额定转速	Rated Speed	3000	RPM
最大转速	Max.Speed	4500	RPM
转动惯量	Inertia	6.6Kg/cm2	
轴径	Shaft Dia	Ø19	mm
外径	Diameter	□80	mm
凸缘		Ø70	mm
中心距		Ø90	



Notice for ordering 订货须知

Motor's type & measurement
配用电机品牌及端面尺寸
Planetary gearbox's type:
行星减速机系列及规格型号：
Torque:
扭 矩：
Ratio:
减速比：
Backlash:
实际等级：
Mounting position&others requir:
外形及安装方式方面特殊要求：

Step3:确定所订行星减速机规格型号及工厂给出的CAD或PDF图纸，正确书写型号 例如：FAB090D-005-S2-P2/MHMD 082GIU



减速比	3	4	5	6	7	8	10
额定输出扭矩[Nm]	130	140	160	150	140	120	100
最大输出扭矩[Nm]	260	280	320	300	280	240	200
转动惯量[Kg.cm²]	0.61	0.48	0.47	0.45	0.45	0.44	0.44

容许径向力F_{2R}	3250 N	传动效率	≈95%
容许轴向力F_{2A}	1300 N	噪音值	<60dB
容许轴向力F_{2B}	1625 N	使用温度	-10℃~+90℃
额定输入转速	4000 rpm	润滑方式	合成润滑脂（终身润滑）
最大输入转速	8000 rpm	安装方向	任意
扭转间隙等级P0	≤1 arcmin	防护等级	IP65
精密等级P1	≤3 arcmin	使用寿命	20000h（通常说明减半）
标准等级P2	≤5 arcmin	入功连主	FAB090D-Ø19×24.5×M5

重 量	≈3.7Kg
原转刚性	14 Nm/arcmin

备注Bz：
1.具体数据以PDF CAD 3D优先，此后不做通知。
2.具体减速机的额定输出扭矩及转速参见“减速机性能资料”，“机床用减速机额定输出扭矩”，“冲压及电”、“减速机的额定输出扭矩”，非机床产生出现等，或对轴不合理，使其寿命缩短都将不符合IP65。

减速机的选用及注意事项 / GEAR BOX SELECTION & ANNOUNCEMENTS

与选型有关的基本概念/Base concepts of precision planetary gear box

Ratio减速比

Input speed/Output speed 输出转速比上输入转速

额定输入转速 n_1[rpm]

减速机的驱动速度，若减速机与电机直接相连，则转速值与电机转速相同。本书中的额定转入转速是在环境温度为20℃的条件下测得的。环境温度较高时请降低转速n_1

输出转速 n_2[rpm]

输出转速按照下列公式通过输入转速n_1和传动比i计算出来：$n_2=n_1/i$

Poles 段/级数

The number of set of planetary gear. Oweing to one set planetary gear can’ t satisfy bigger transmission ratio,two or three sets can meet Users’ requirements of bigger transimission ratio. Since increasing the gear quantity,the length of two or three poles motor will increase accordingly,of course,the efficiency will reduce accordingly.
行星齿轮的套数。由于一套行星齿轮无法满足较大的传动比，有时需要两套或三套来满足用户对较大传动比的求，也就是说，减速比越大段/级数越多。由于增加了行星齿轮的数量，所以二级或三级减速机的长度会有所增加，效率会有所下降。

Efficiency 传动效率

If refers to the gearing efficiency of the gearboxes in the case of the largest load.
指在额定负载情况下，减速机的传输效率。减速比越大，级数越多，效率越低。

Average lifetime 平均寿命

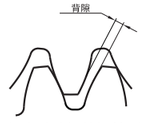
Refers to the continuous working time of the gearboxes of the highestinputrev.
指减速机在额定负载下，额定输入转速是减速机的连续工作时间。

Precise positioning 定位精度

In high-speed reciprocating mechanical movement achieve precise positioning is the key to minimizing the movement through the angular deviation,positioning accuracy depends on the two values,with a load of the deflection angle,involving a return to space with torsion stiffness,and the other is control of the movement and rotation angle,involving partial synchronization the problem worse.
在高速机械往复运动中做到精确定位的关键在于尽量减小通过运动产生的角偏差。定位精度取决于两个值，一个是与加载有关的偏转角，涉及到回程间隙和扭转刚度；另一个是与运动控制有关的偏转角，涉及到同步偏差问题。

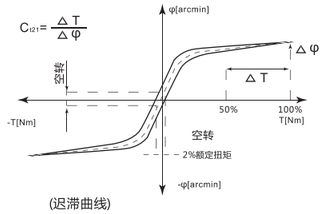
Backlash 回程间隙背隙

减速机输出轴与输入轴的最大偏差角，测量时先将齿轮输入轴固定住，然后在输出轴用力矩仪加载一定力矩（2%T_{2N}），以克服减速机内的摩擦力。



迟滞曲线

迟滞曲线是为了得出减速机的扭转刚度，通过检测得到迟滞曲线。检测时，先将减速机输入端固定住，然后在输出端的两个旋转方向分别持续地加载到T_{2B}最大输出力矩，继而逐步卸载，用仪器记录下力矩的仿差角，得到的曲线是一条闭合曲线，从中可以计算出减速机制回程间隙（jt）和扭转刚度(C_{t21})。



(迟滞曲线)

Inertia 转动惯性

Moment of the rotary inertiain this description refers to that at the input terminal.Said an object strive to maintain their rotational state(or a stationary of rotating)characteristics of a value.
本说明书中的该值均指输入端。表示一个物体尽力保持自己转动状态（或静止或转动）特征的一个值。

The proportion of inertia 惯量比

Refer to the ration of load inertia and inertia drive system(motor with gearbox).This ratio determines the controllable of the λ value,the greater is the moment of inertia greater margin,high-dynamic action on the more difficult process of precision control.The values can be control in 5,gearboxes can be used to reduce load $1/i^2$.
是指负载惯量与传动系统惯量（电机加上减速机）之间的比值。这个比值决定了系统的可控性。λ值越大，也就是各转动惯量差值越大，高动态的动作过程就越难精确控制，建议尽可能将λ值控制在＜5。齿轮箱可以将负载惯量降低$1/i^2$。

Noise 噪音

The unit is decibel(dB).The value is measured when the input rev is 3000r/m without load and at the distance of one meter from the gearboxes.
单位是分贝（dB）。此数值是在输入转速为3000转/分时，不带负载，距离减速机一米距离时测量的。

Operating conditions 工作条件

Operating temp/工作温度℃	-10℃~+90℃
Degree of protection/防护等级	IP54/IP65
Lubrication/润滑	Life time lubrication/长效润滑，整个试用期内无需添加润滑剂
Mounting position/安装方式	Any/任意

减速机的选用及注意事项 / GEAR BOX SELECTION & ANNOUNCEMENTS

与选型有关的基本概念/Base concepts of precision planetary gear box

额定输出扭矩 T_{2N}[Nm]	T_{2N}[Nm]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，安全系数S=1,FG160/FAB142以下机型，理论寿命为20000小时：FAB180以上机型理论寿命为10000小时：T_N值遵守ISODP6336齿轮标准与ISO281轴承标准。
加速扭矩 [Nm]	指工作周期每小时少于1000次时允许短时间加载到输出端的最大力矩。工作周期每小时大于1000次时，须考虑冲击因素。加速扭转是周期工作制选型时的一个最大值，实际使用中的加速力矩必须小于T_{2B}，否则会缩短减速机的寿命。
紧急制动扭矩 [Nm]	指减速机输出端所能加载的最大力矩，这个力矩可在减速机寿命期内加载1000次，绝对不能超过1000次。（备注：FG160/FAB142以下机型为$T_{2HOT}=2•T_{2B}$ FAB180以上机型为$T_{2HOT}=1.5•T_{2B}$)
空载扭矩 T_{012}[Nm]	指加载到减速机上的以克服减速机内摩擦力的力矩。
最大输出扭矩 T_{2B}	指减速机在静态条件或频繁启动条件下所能承受的输出扭矩，通常指峰值负载或启动负载。
实际所需扭矩 T_2[Nm]	所需扭矩取决于应用场合的实际工况，拟选减速机的额定扭矩T_{2N}必须大于这个扭矩。
计算用扭矩 T_{C2}[Nm]	会在选择减速机时被用到，可以由实际所需转矩T_2和系数f_s，按以下公式得出 $T_{C2}=T_2*f_s\leq T_N$
侧倾扭矩 [Nm]	指轴向力和径向力作用于输出端轴承上径向受力点的力矩。其计算公式为：$M_{2kmax}=[Fa*y_2+Fr*(X_2+Z_2)]/1000$
轴向力 Fa[N]	是指平行于轴心的一个力，它的作用点与输出轴端有一定的轴向偏差（Y_2）时，会形成一个额外的弯挠力矩。轴向力超过样本所示的额定值时，须用联轴节来抵消这种弯挠力。
径向力 Fr[N]	指垂直作用于轴向力的一个力，它平行于输出轴，它的作用点与轴端有一定的轴向距离（X_2）。这个点成一个杠杆点，横向力形成一个弯挠力矩。
轴伸径向载荷、轴向载荷	选择减速机的附加依据是输出轴伸出端上的径向载荷和轴向载荷。轴的强度和轴承的承载能力决定了许用轴伸的径向载荷。产品样本中给出的最大允许值是指在最不利的方向作用在 轴伸出端中点（即1/2L处）的力。当作用力不在中点时，越接近轴肩，允许的径向载荷就越大；相反，作用点离轴肩越远，允许的径向载荷就越小。
安全系数 s	安全系数等于减速机的额定输入功率与电机功率的比值。
使用系数 f_1	使用系数表现减速机的应用特征，它考虑到减速机的负载类型和每日工作时间。
扭转刚度C_{t21} [Nm/Arcmin]	由加载力矩和所产生的扭转角之间的比率来定义。$C_{t21}=\triangle T/\triangle$它说明需要用多大的力矩才能把输出轴转动一弧分。扭转刚度是从迟滞曲线得出的。在曲线图上只需要关注T_{2B}的50%到100%这个范围，在这个范围内，曲线可看成是一条直线。
安装力矩 [Nm]	减速机的组装以及电机与减速机连接安装（输入轴采用弹性联轴器要求），都是有力矩要求。建议使用力矩扳手来完成安装步骤。
Special Notice 特别注意	You can only refer to the input terminal dimension given in this book,special dimension is depend on the shaft extension terminal of chosen motor,practical object’ s dimension will be difference with these in book,the practical is depend on the finished product,the output terminal dimension is according to these given in this book if not sign. The weight of reduce motor given in this book is approximation,the practical is depend on the finished product. 本书给出的所有减速机输入端尺寸仅供参考，具体尺寸由适配电机的轴伸端尺寸决定，因此实物外形尺寸与本手册有所差异，应以订购货品的标准图纸为准，在没有特殊制定状态下减速机的输出端尺寸以本书为准。 本书给出的所有减速机重量为近似值，实际重量以实物为准。书中错误之处还请见谅。

CHBNS-MOTOR



FAB
SERIES

PRECISION PLANETARY
GEAR REDUCER

精密行星齿轮减速机

WWW.CHBNS.COM

型号说明 / MODEL ILLUMINATE

选用范例：FAB090-10-S2-P2/MHMD-082G1U

CHBNS 传承之道 稳行致远
传动装置专业制造商
PROFESSIONAL MANUFACTURER OF TRANSMISSION DEVICE
FAB系列

减速机性能资料 / GEAR BOX PERFORMANCE INFORMATION

规 格		级 数	减速比[1]	FAB042	FAB060	FAB090	FAB115	FAB142	FAB180	FAB220
额定输出力矩T_{2N}	Nm	1	3	20	55	130	208	342	588	1,140
			4	19	50	140	290	542	1,050	1,700
			5	22	60	160	330	650	1,200	2,000
			6	20	55	150	310	600	1,100	1,900
			7	19	50	140	300	550	1,100	1,800
			8	17	45	120	260	500	1,000	1,600
			10	14	40	100	230	450	900	1,500
		2	12	20	55	130	208	342	588	1,140
			15	20	55	130	208	342	588	1,140
			20	19	50	140	290	542	1,050	1,700
			25	22	60	160	330	650	1,200	2,000
			30	22	55	130	208	342	588	1,140
			35	22	60	160	330	650	1,200	2,000
			40	22	50	140	290	542	1,050	1,700
			50	22	60	160	330	650	1,200	2,000
			60	20	55	150	310	600	1,100	1,900
			70	19	50	140	300	550	1,100	1,800
			80	17	45	120	260	500	1,000	1,600
			100	14	40	100	230	450	900	1,500
最大输出力矩T_{2B}	Nm	1,2	3~100	3倍额定输出力矩						
额定输入转速n_1	rpm	1,2	3~100	5,000	5,000	4,000	4,000	3,000	3,000	2,000
最大输入转速n_{1B}	rpm	1,2	3~100	10,000	10,000	8,000	8,000	6,000	6,000	4,000
超精密背隙 P0	arcmin	1	3~10	—	—	≤1	≤1	≤1	≤1	≤1
		2	3~100	—	—	—	≤3	≤3	≤3	≤3
精密背隙 P1	arcmin	1	3~10	≤3	≤3	≤3	≤3	≤3	≤3	≤3
		2	12~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5
标准背隙 P2	arcmin	1	3~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	12~100	≤7	≤7	≤7	≤7	≤7	≤7	≤7
扭转刚性	Nm/arcmin	1,2	3~100	3	7	14	25	50	145	225
容许径向力F_{2rB}[2]	N	1,2	3~100	780	1,530	3,250	6,700	9,400	14,500	50,000
容许轴向力F_{2a1B}[2]	N	1,2	3~100	350	630	1,300	3,000	4,000	6,200	35,000
容许轴向力F_{2a2B}[2]	N	1,2	3~100	390	765	1,625	3,350	4,700	7,250	25,000
使用寿命	hr	1,2	3~100	20,000*						
效率 η	%	1	3~10	≥97%						
		2	12~100	≥94%						
重量	kg	1	3~10	0.5	1.3	3.7	7.8	14.5	29	48
		2	12~100	0.8	1.9	4.1	9	17.5	33	60
使用温度	℃	1,2	3~100	-10℃~+90℃						
润滑		1,2	3~100	合成润滑油脂						
防护等级		1,2	3~100	IP65						
安装方向		1,2	3~100	任意方向						
噪音值（n_1=3000rpm）	dB	1,2	3~100	≤56	≤58	≤60	≤63	≤65	≤67	≤70

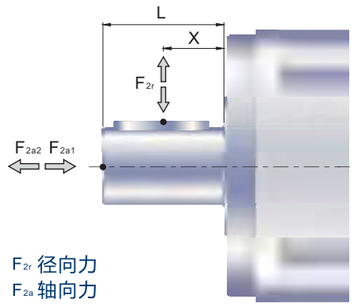
减速机转动惯量

规 格		级 数	减速比[1]	FAB042	FAB060	FAB090	FAB115	FAB142	FAB180	FAB220
转动惯量J_1	kg·cm²	1	3	0.03	0.16	0.61	3.25	9.21	28.98	69.61
			4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
			5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
			6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
			7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
			8	0.03	0.13	0.44	2.58	7.07	22.59	50.84
			10	0.03	0.13	0.44	2.57	7.03	22.51	50.56
		2	12	0.03	0.14	0.13	0.47	2.71	7.42	23.29
			15	0.03	0.13	0.13	0.47	2.71	7.42	23.29
			20	0.03	0.13	0.13	0.47	2.71	7.42	23.29
			25	0.03	0.13	0.13	0.47	2.71	7.42	23.29
			30	0.03	0.13	0.13	0.47	2.71	7.42	23.29
			35	0.03	0.13	0.13	0.47	2.71	7.42	23.29
			40	0.03	0.13	0.13	0.47	2.71	7.42	23.29
			50	0.03	0.13	0.13	0.44	2.57	7.03	22.51
			60	0.03	0.13	0.13	0.44	2.57	7.03	22.51
			70	0.03	0.13	0.13	0.44	2.57	7.03	22.51
			80	0.03	0.13	0.13	0.44	2.57	7.03	22.51
			100	0.03	0.13	0.13	0.44	2.57	7.03	22.51

1.减速比（$i=N_{in}/N_{out}$）
2.输出转数 **100rpm** 时，作用于输出轴中心位置。
* 连续运转降低使用寿命二分之一。

减速机输出轴之容许径向力及轴向力

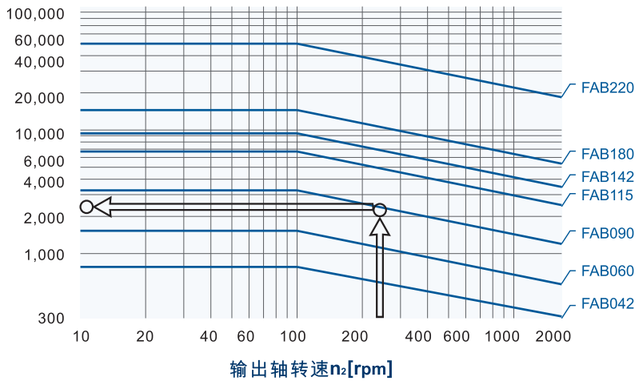
REDUCER OUTPUT SHAFT OF THE PERMISSIBLE RADIAL FORCE AND SHAFT AND FORCE



减速机输出轴所能承受之最大径向力及轴向力。端视内部支撑轴承之设计，减速机采用大尺寸的轴承及较大跨距的设计，其能承受更大的径向及轴向负荷。

The maximum radial and axial forces that the output shaft of the gearbox can withstand. Looking at the design of internal support bearings, the reducer adopts large-sized bearings and a design with a larger span, which can withstand greater radial and axial loads.

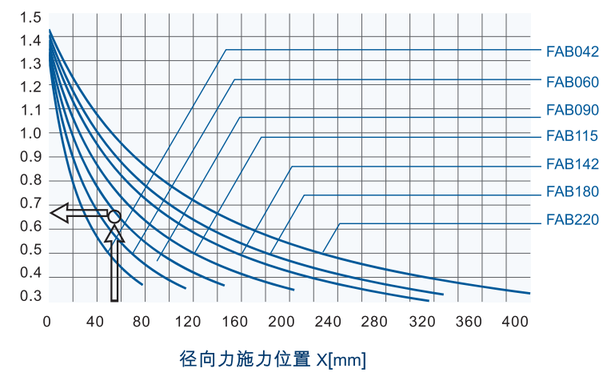
容许径向力F_{2rB}[N]施力于轴中心位置



当径向力F_{2r}施力于轴中心位置即X=1/2xL时，不同规格之减速机在不同输出转速运用下使用寿命为20,000hr*时，所能承受之容许径向力F_{2rB}，请参照左图，而能承受之容许轴向力F_{2aB}，为

$F_{2a1B}=0.2xF_{2rB}$
$F_{2a2B}=0.1xF_{2rB}$

位置负荷系数k_b



当径向力F_{2r}施力不在轴中心位置时，越靠近减速机即X＜1/2xL，所能承受之容许径向力变大，越远离减速机即X＞1/2xL时，所能承受之容许径向力则变小，藉由左图，依减速机规格及径向力施力位置X，查出位置负荷洗澈K_b，在代入下列公式，求出容许
径向力：
$F'_{2rB}=KbxF_{2rB}$
轴向力:
$F'_{2a1B}=0.2xF'_{2rB}$
$F'_{2a2B}=0.1xF'_{2rB}$

＊连续运转降低使用寿命二分之一

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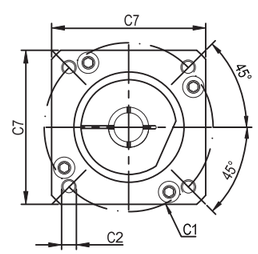
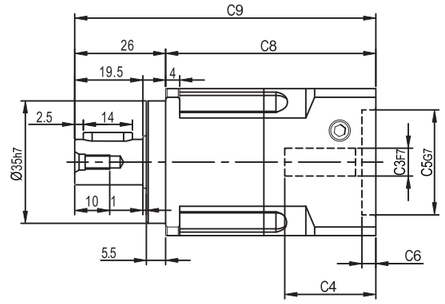
FAB系列

外形尺寸图表 / DIMENSION SHEET

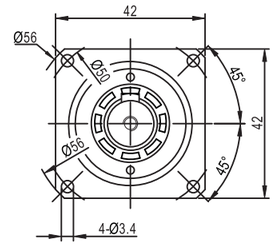
FAB-042D-L1

输入端 / INPUT



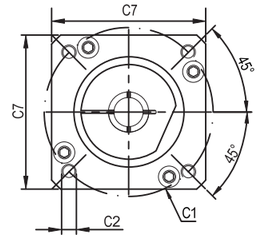


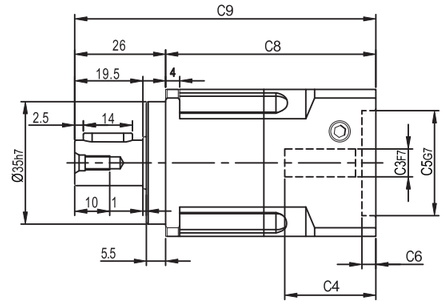
输出端 / OUTPUT



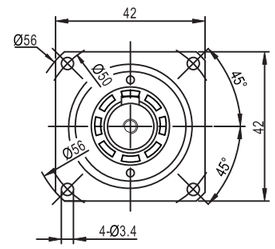
FAB-042D-L2

输入端 / INPUT

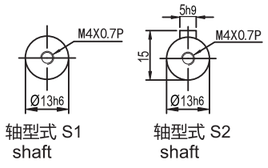




输出端 / OUTPUT



输出轴径/Output Diameter



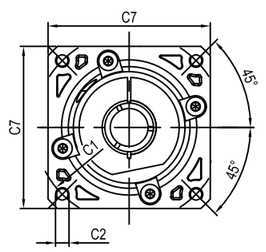
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAB-042D-L1	Ø46	4-M4x10	Ø8	26	Ø30	4	42	60	86
	Ø45	4-M3x8							
FAB-042D-L2	Ø46	4-M4x10	Ø8	26	Ø30	4	42	84.5	110. 5
	Ø45	4-M3x8							

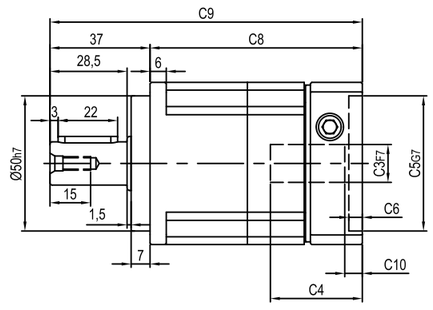
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised.
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / DIMENSION SHEET

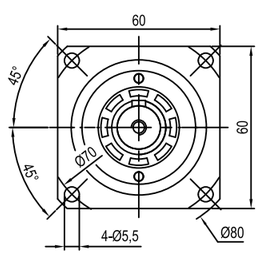
FAB-060D(M1)-L1

输入端 / INPUT



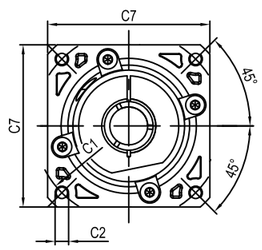


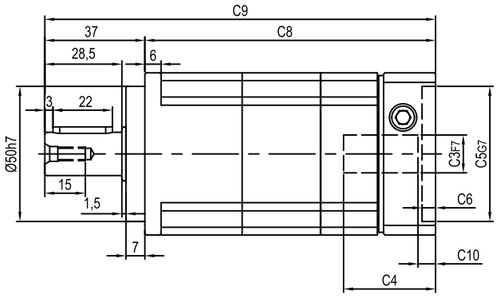
输出端 / OUTPUT



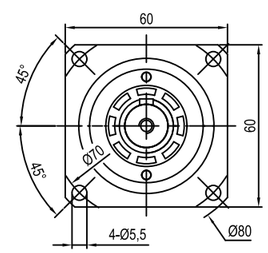
FAB-060D(M1)-L2

输入端 / INPUT

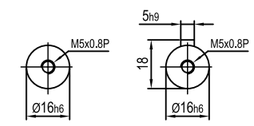




输出端 / OUTPUT



输出轴径/Output Diameter



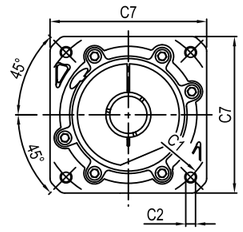
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-060D-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	78.5	115.5	5.5
FAB-060D-L2								107.5	144.5	5.5
FAB-060D-L1	Ø70	4-M4x10,4-M5x12	Ø11, Ø14	34	Ø50	5	60	78.5	115.5	5.5
FAB-060D-L2								107.5	144.5	5.5
FAB-060M-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	85	122	12
FAB-060M-L2								114	151	12

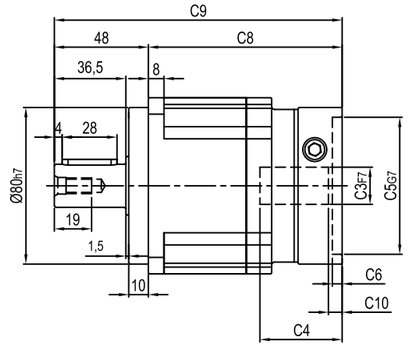
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised.
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / DIMENSION SHEET

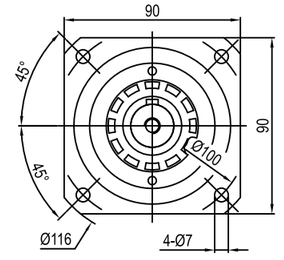
FAB-090D(M1)-L1

输入端 / INPUT



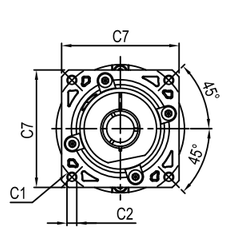


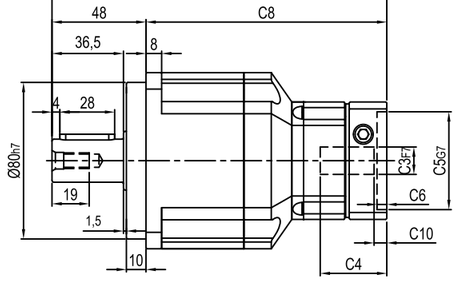
输出端 / OUTPUT



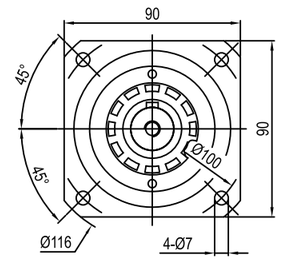
FAB-090D(M1)-L2

输入端 / INPUT

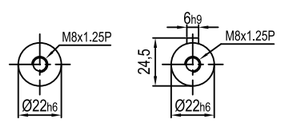




输出端 / OUTPUT



输出轴径/Output Diameter



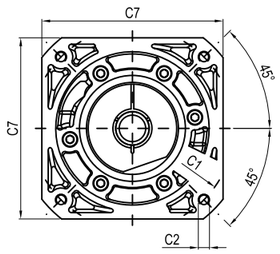
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	99	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	99	147	6
FAB-090M1-L1	Ø115	4-M8x20	Ø19, Ø22	56.5	Ø95	8	100	114.5	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	117	165	19
FAB-090D-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	123	171	5.5
	Ø70	4-M4x10,4-M5x12	Ø11, Ø14	34	Ø50	5	60	123	171	5.5
FAB-090M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	129.5	177.5	12
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	129.5	177.5	11

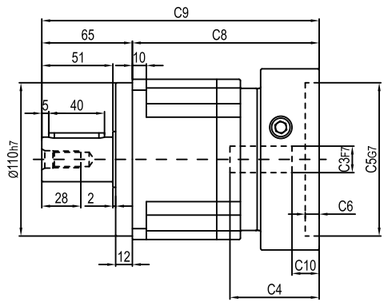
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / DIMENSION SHEET

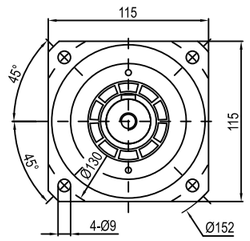
FAB-115D(M1)-L1

输入端 / INPUT



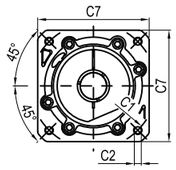


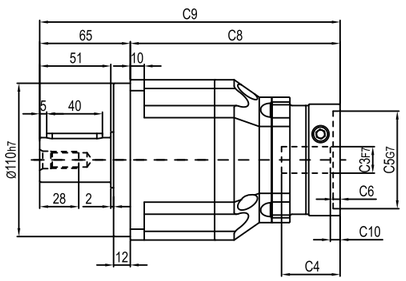
输出端 / OUTPUT



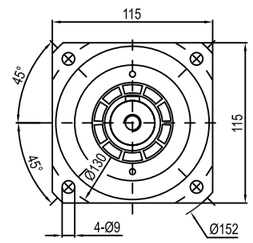
FAB-115D(M1)-L2

输入端/ INPUT

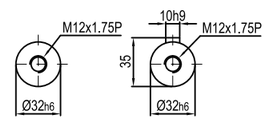




输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1 shaft　　轴型式 S2 shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-115D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	134	199	19.5
FAB-115M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	151.5	216.5	28
FAB-115D-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	150.5	215.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	150.5	215.5	6
FAB-115M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	166	231	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	168.5	233.5	19

* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

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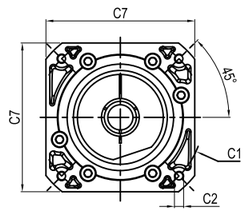
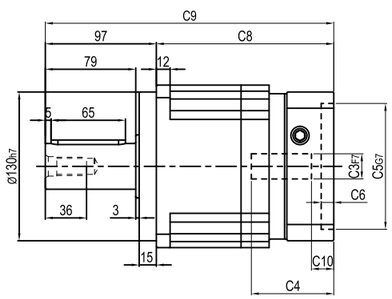
外形尺寸图表 / DIMENSION SHEET

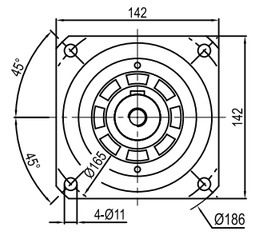
FAB-142D(M1)-L1

输入端/ INPUT



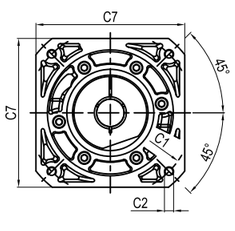


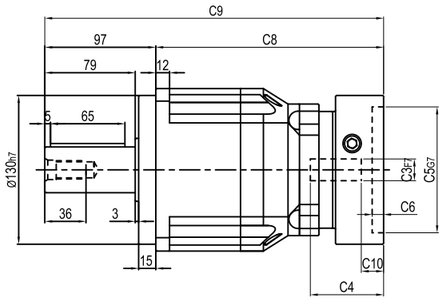
输出端/OUTPUT



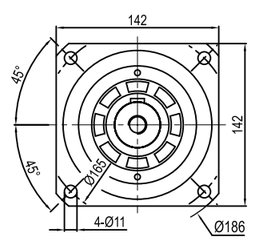
FAB-142D(M1)-L2

输入端/ INPUT

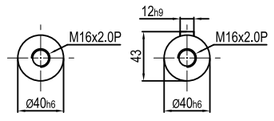




输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1 shaft　　轴型式 S2 shaft

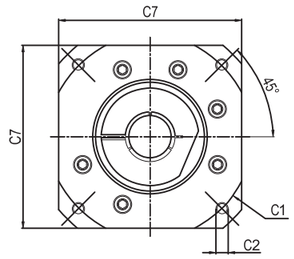
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-142D-L1	Ø145	4-M8x20	Ø22, Ø24	72	Ø110	11	130	155	252	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	165	262	25
FAB-142D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	199	296	19.5
FAB-142M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	216.5	313.5	28

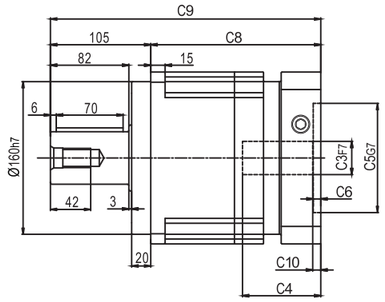
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / DIMENSION SHEET

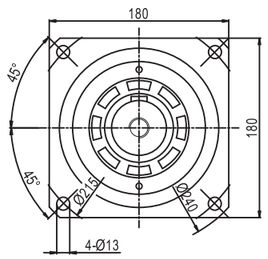
FAB-180D-L1

输入端/INPUT



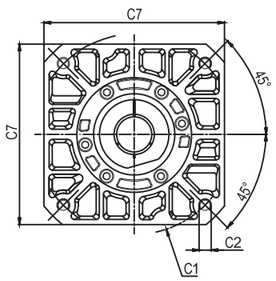


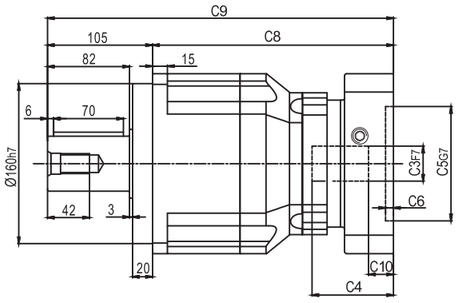
输出端/ OUTPUT



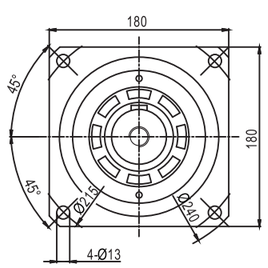
FAB-180D-L2

输入端/ INPUT

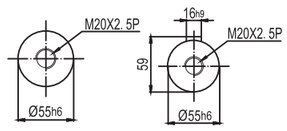




输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1 shaft　　轴型式 S2 shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-180D-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	178	283	8.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	213.5	318.5	45.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	183	288	13.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	213.5	318.5	45.5
FAB-180D-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	231	336	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	241	346	25

* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

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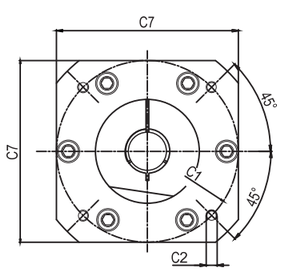
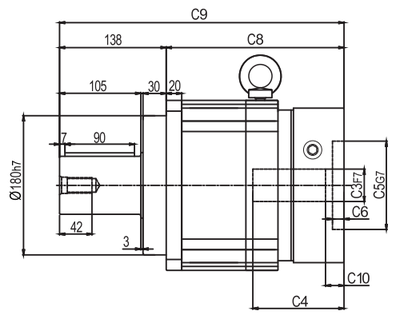
FAB系列

外形尺寸图表 / DIMENSION SHEET

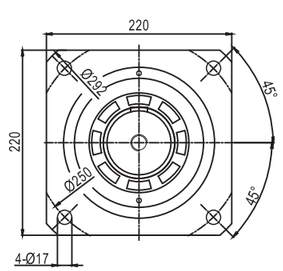
FAB-220D-L1

输入端/ INPUT



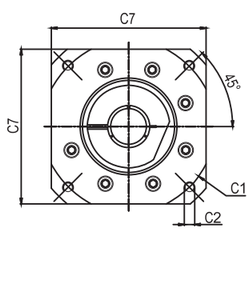


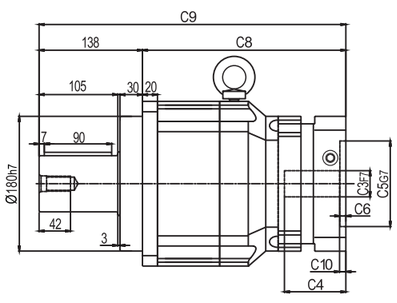
输出端/OUTPUT



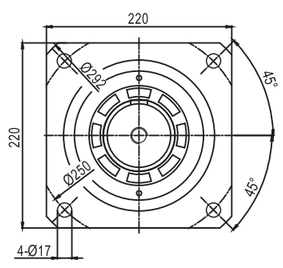
FAB-220D-L2

输入端/ INPUT

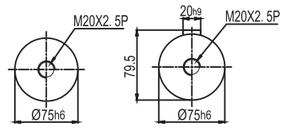




输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1 shaft　　轴型式 S2 shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-220D-L1	Ø200	4-M12x28	Ø35,Ø42	118	Ø114.3	15	200	230	368	24
	Ø215	4-M12x30	Ø38	108	Ø180	8	200	220	358	11.5
	Ø235	4-M12x30	Ø42,Ø55	118	Ø200	10	220	230	368	24
FAB-220D-L2	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	271.5	409.5	8.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	307	445	45.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	276.5	414.5	13.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	307	445	45.5

* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
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* D: Conventional Hole, M1: Limit Hole

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FB/FE

SERIES

PRECISION PLANETARY
GEAR REDUCER

精密行星齿轮减速机

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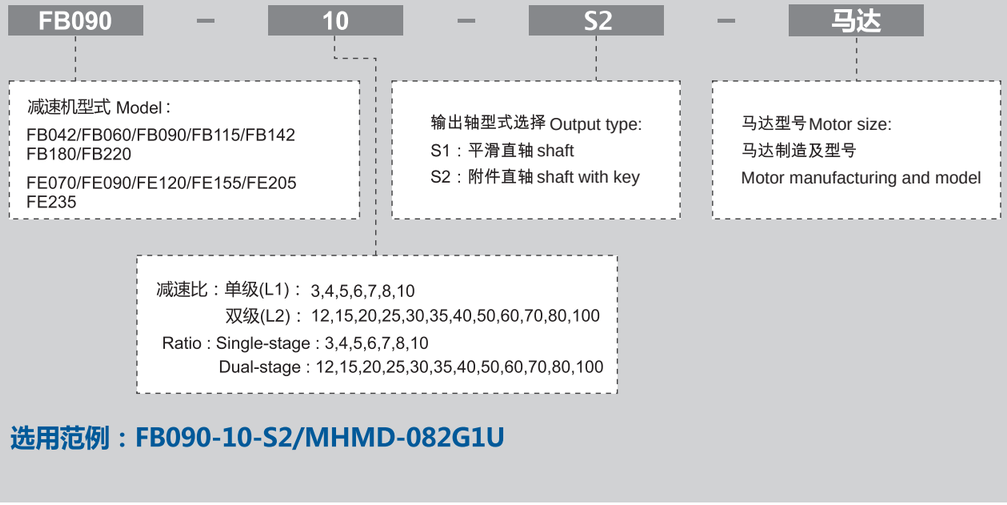
型号说明 / MODEL ILLUMINATE



选用范例：FB090-10-S2/MHMD-082G1U

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减速机性能资料 / GEAR BOX PERFORMANCE INFORMATION

规 格		级 数	减速比[1]	FB042	FB060 FE070	FB090 FE090	FB115 FE120	FB142 FE155	FB180 FE205	FB220 FE235
额定输出力矩T_{2N}	Nm	1	3	20	55	130	208	342	588	1,140
			4	19	50	140	290	542	1,050	1,700
			5	22	60	160	330	650	1,200	2,000
			6	20	55	150	310	600	1,100	1,900
			7	19	50	140	300	550	1,100	1,800
			8	17	45	120	260	500	1,000	1,600
			10	14	40	100	230	450	900	1,500
		2	12	20	55	130	208	342	588	1,140
			15	20	55	130	208	342	588	1,140
			20	19	50	140	290	542	1,050	1,700
			25	22	60	160	330	650	1,200	2,000
			30	22	50	130	208	342	588	1,140
			35	22	60	160	330	650	1,200	2,000
			40	22	50	140	290	542	1,050	1,700
			50	22	60	160	330	650	1,200	2,000
			60	20	55	150	310	600	1,100	1,900
			70	19	50	140	300	550	1,100	1,800
			80	17	45	120	260	500	1,000	1,600
			100	14	40	100	230	450	900	1,500
最大输出力矩T_{2B}	Nm	1,2	3~100	3倍额定输出力矩						
额定输入转速n_1	rpm	1,2	3~100	5,000	5,000	4,000	4,000	3,000	3,000	2,000
最大输入转速n_{1B}	rpm	1,2	3~100	10,000	10,000	8,000	8,000	6,000	6,000	4,000
背隙	arcmin	1	3~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	12~100	≤7	≤7	≤7	≤7	≤7	≤7	≤7
扭转刚性	Nm/arcmin	1,2	3~100	3	7	14	25	50	145	225
容许径向力F_{2rB}[2]	N	1,2	3~100	780	1,530	3,250	6,700	9,400	14,500	50,000
容许轴向力F_{2aB}[2]	N	1,2	3~100	350	630	1,300	3,000	4,000	6,200	35,000
容许轴向力F_{2aB}[2]	N	1,2	3~100	390	765	1,625	3,350	4,700	7,250	25,000
使用寿命	hr	1,2	3~100	20,000*						
效率 η	%	1	3~10	≥97%						
		2	12~100	≥94%						
重量	kg	1	3~10	0. 5	1.3	3.7	7.8	14.5	29	48
		2	12~100	0. 8	1.9	4.1	9	17.5	33	60
使用温度	℃	1,2	3~100	-10℃~+90℃						
润滑		1,2	3~100	合成润滑油脂						
防护等级		1,2	3~100	IP65						
安装方向		1,2	3~100	任意方向						
噪音值（n_1=3000rpm）	dB	1,2	3~100	≤56	≤58	≤60	≤63	≤65	≤67	≤70

减速机转动惯量

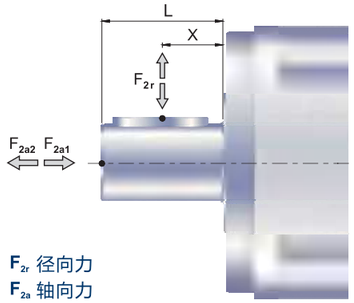
规 格		级 数	减速比[1]	FB042	FB060 FE070	FB090 FE090	FB115 FE120	FB142 FE155	FB180 FE205	FB220 FE235
转动惯量J_1	kg·cm²	1	3	0.03	0.16	0.61	3. 25	9. 21	28.98	69.61
			4	0.03	0.14	0.48	2. 74	7. 54	23.67	54.37
			5	0.03	0.13	0.47	2. 71	7. 42	23.29	53.27
			6	0.03	0.13	0.45	2. 65	7. 25	22.75	51.72
			7	0.03	0.13	0.45	2. 62	7. 14	22.48	50.97
			8	0.03	0.13	0.44	2. 58	7. 07	22.59	50.84
			10	0.03	0.13	0.44	2. 57	7. 03	22.51	50.56
		2	12	0.03	0.14	0.13	0. 47	2. 71	7.42	23.29
			15	0.03	0.13	0.13	0. 47	2. 71	7.42	23.29
			20	0.03	0.13	0.13	0. 47	2. 71	7.42	23.29
			25	0.03	0.13	0.13	0. 47	2. 71	7.42	23.29
			30	0.03	0.13	0.13	0. 47	2. 71	7.42	23.29
			35	0.03	0.13	0.13	0. 47	2. 71	7.42	23.29
			40	0.03	0.13	0.13	0. 47	2. 71	7.42	23.29
			50	0.03	0.13	0.13	0.44	2. 57	7.03	22.51
			60	0.03	0.13	0.13	0.44	2. 57	7.03	22.51
			70	0.03	0.13	0.13	0.44	2. 57	7.03	22.51
			80	0.03	0.13	0.13	0.44	2. 57	7.03	22.51
			100	0.03	0.13	0.13	0. 44	2. 57	7.03	22.51

1.减速比（$i=N_{in}/N_{out}$）
* 连续运转降低使用寿命二分之一。

2.输出转数 **100rpm** 时，作用于输出轴中心位置。

减速机输出轴之容许径向力及轴向力

REDUCER OUTPUT SHAFT OF THE PERMISSIBLE RADIAL FORCE AND SHAFT AND FORCE

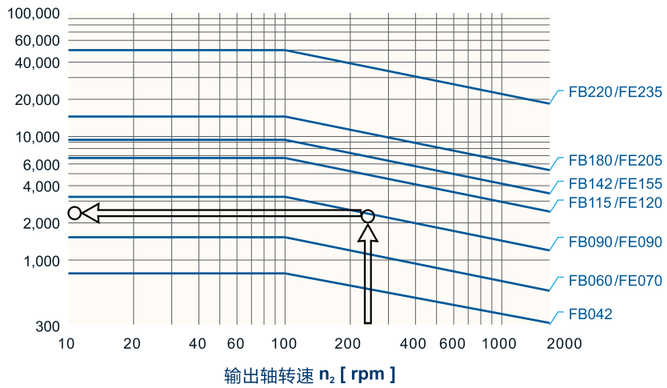


F_{2r} 径向力
F_{2a} 轴向力

减速机输出轴所能承受之最大径向力及轴向力。端视内部支撑轴承之设计，减速机采用大尺寸的轴承及较大跨距的设计，其能承受更大的径向及轴向负荷。

The maximum radial and axial forces that the output shaft of the gearbox can withstand. Looking at the design of internal support bearings, the reducer adopts large-sized bearings and a design with a larger span, which can withstand greater radial and axial loads.

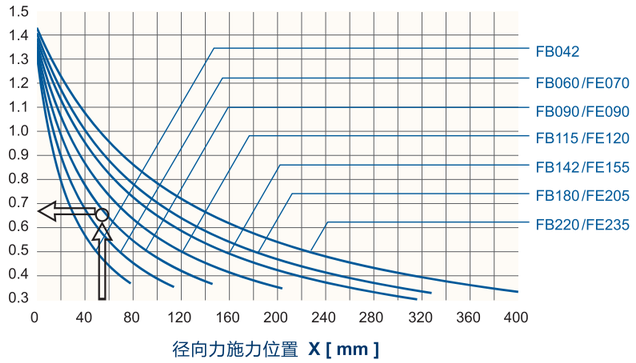
容许径向力F_{2rB} [N] 施力于轴中心位置



当径向力F_{2r}施力于轴中心位置即X=1/2xL时，不同规格之减速机在不同输出转速运用下使用寿命为20,000hr*时，所能承受之容许径向力F_{2rB}，请参照左图，而能承受之容许轴向力F_{2aB}，为

$F_{2a1B}=0.2xF_{2rB}$
$F_{2a2B}=0.1xF_{2rB}$

位置符合系数k_b



当径向力F_{2r}施力不在轴中心位置时，越靠近减速机即X < 1/2xL，所能承受之容许径向力变大，越远离减速机即X > 1/2xL时，所能承受之容许径向力则变小，藉由左图，依减速机规格及径向力施力位置X，查出位置负荷洗漱K_b，在代入下列公式，求出容许径向力：

$F'_{2rB}=KbxF_{2rB}$
轴向力:
$F'_{2a1B}=0.2xF'_{2rB}$
$F'_{2a2B}=0.1xF'_{2rB}$

＊ 连续运转降低使用寿命二分之一。

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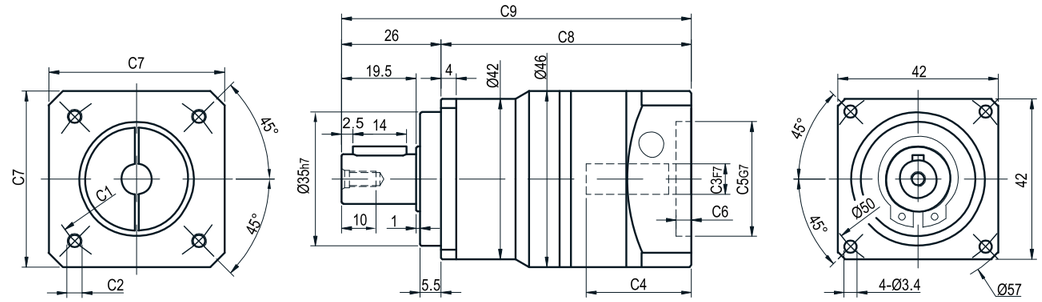
外形尺寸图表 / DIMENSION SHEET

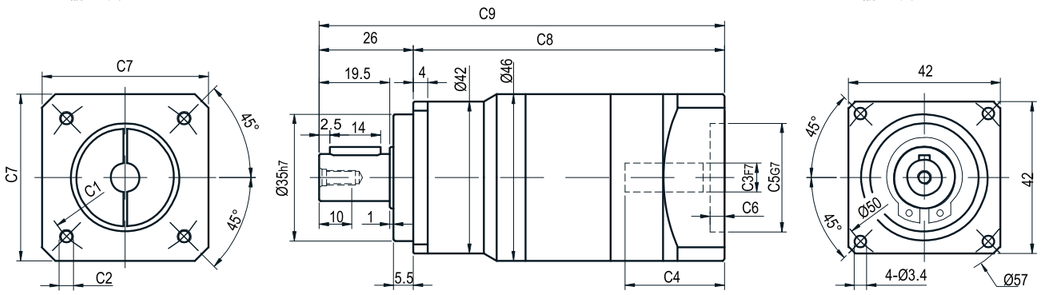
FB-042-L1

输入端/ INPUT　　输出端/OUTPUT

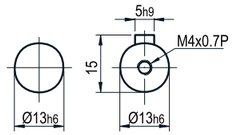


FB-042-L2

输入端/ INPUT　　输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1 shaft　　轴型式 S2 shaft

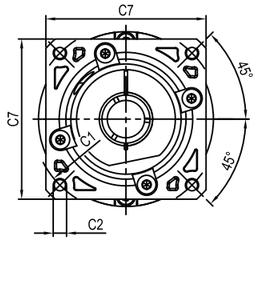
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FB-042-L1	Ø45	4-M3x8	Ø8	27.5	Ø30	5	46	65.5	91.5
	Ø46	4-M4x10	Ø8	27.5	Ø30	5	46	65.5	91.5
	Ø66.67	4-M4x10	Ø6.35,Ø8	27.5	Ø38.1	5	57	65.5	91.5
	Ø70	4-M4x10,4-M5x12	Ø11	32	Ø50	5	60	70	96
FB-042-L2	Ø45	4-M3x8	Ø8	27.5	Ø30	5	46	86	112
	Ø46	4-M4x10	Ø8	27.5	Ø30	5	46	86	112
	Ø66.67	4-M4x10	Ø6.35,Ø8	27.5	Ø38.1	5	57	86	112

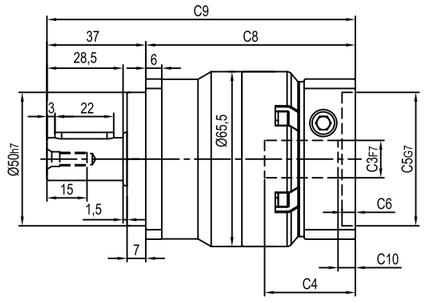
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。

外形尺寸图表 / DIMENSION SHEET

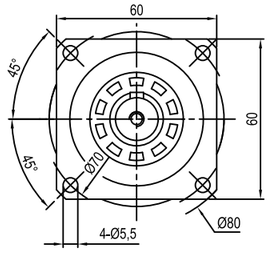
FB-060D(M1)-L1

输入端/INPUT



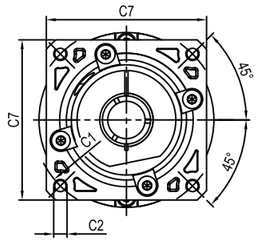


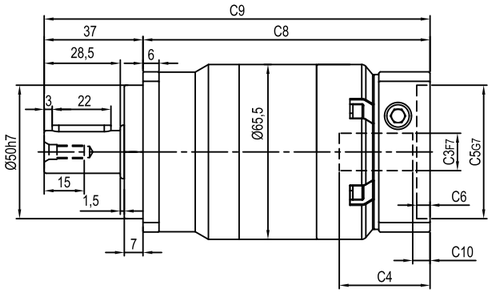
输出端/ OUTPUT



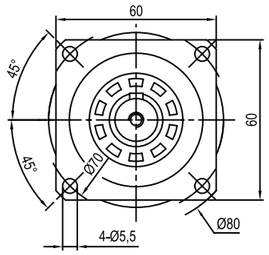
FB-060D(M1)-L2

输入端/ INPUT

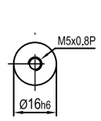




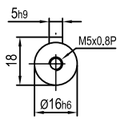
输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft



轴型式 S2
shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-060D-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	78.5	115.5	5.5
FB-060D-L2								107.5	144.5	5.5
FB-060D-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	78.5	115.5	5.5
FB-060D-L2								107.5	144.5	5.5
FB-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	85	122	12
FB-060M1-L2								114	151	12

* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

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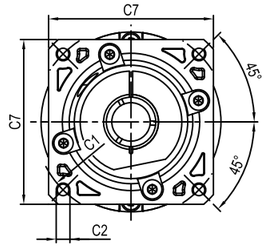
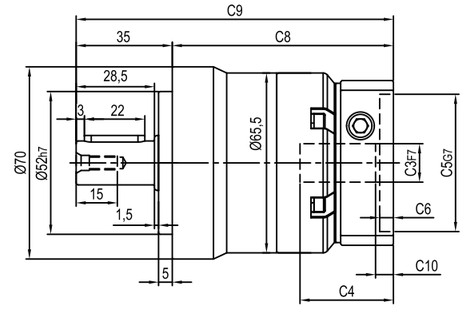
外形尺寸图表 / DIMENSION SHEET

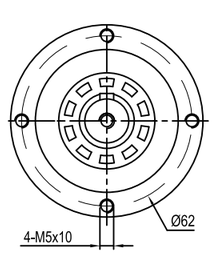
FE-070D(M1)-L1

输入端 / INPUT



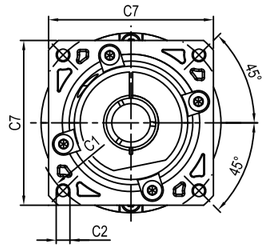


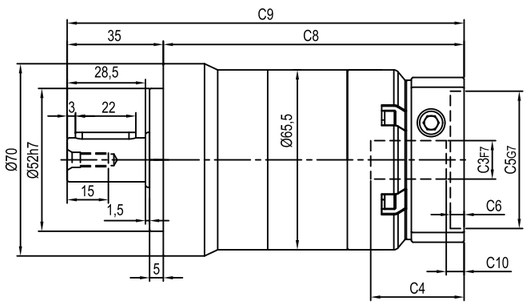
输出端 / OUTPUT



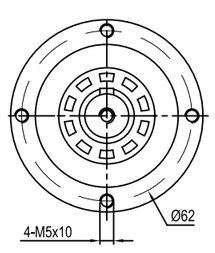
FE-070D(M1)-L2

输入端 / INPUT

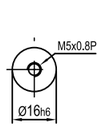




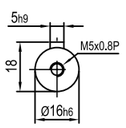
输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft



轴型式 S2
shaft

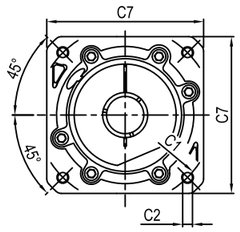
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-070D-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	80.5	115.5	5.5
FE-070D-L2								109.5	144.5	5.5
FE-070D-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	80.5	115.5	5.5
FE-070D-L2								109.5	144.5	5.5
FE-070M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	87	122	12
FE-070M1-L2								116	151	12

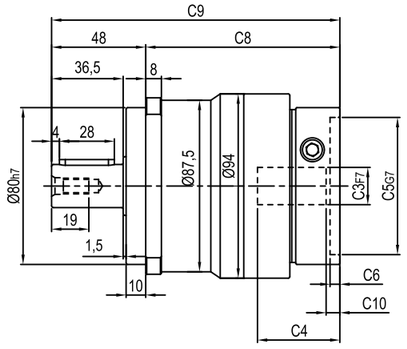
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / DIMENSION SHEET

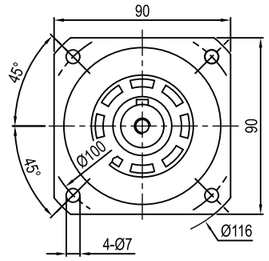
FB-090D(M1)-L1

输入端/ INPUT



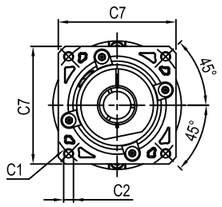


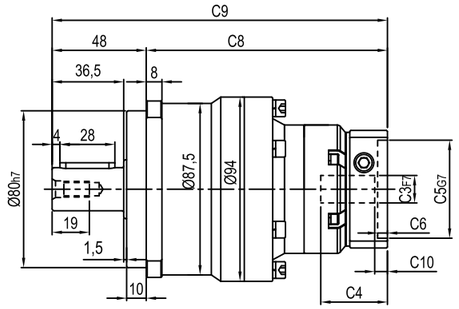
输出端/OUTPUT



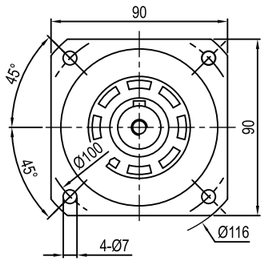
FB-090D(M1)-L2

输入端/ INPUT

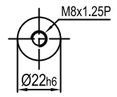




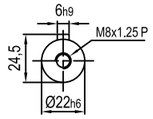
输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft



轴型式 S2
shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	99	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	99	147	6
FB-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	114.5	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	117	165	19
FB-090D-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	123	171	5.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	123	171	5.5
FB-090M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	129.5	177.5	12
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	129.5	177.5	11

* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

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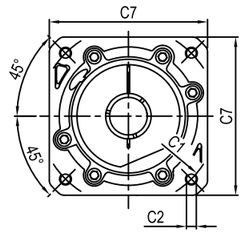
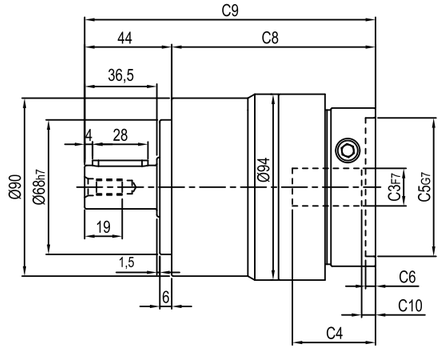
外形尺寸图表 / DIMENSION SHEET

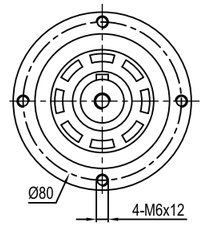
FE-090D(M1)-L1

输入端 / INPUT



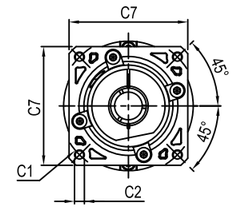


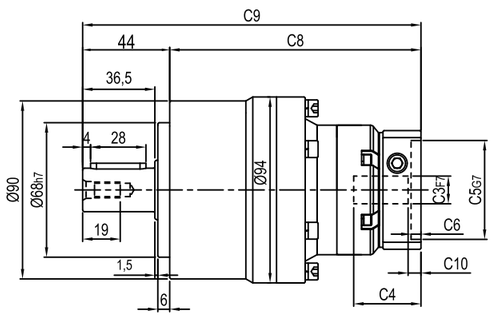
输出端 / OUTPUT



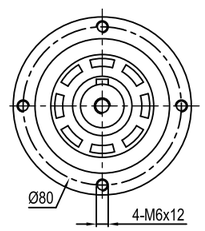
FE-090D(M1)-L2

输入端 / INPUT

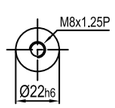




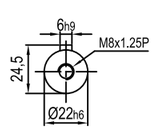
输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft



轴型式 S2
shaft

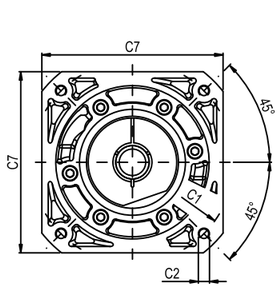
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	103	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	103	147	6
FE-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	118.5	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	121	165	19
FE-090D-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	127	171	5.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	127	171	5.5
FE-090M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	133.5	177.5	12
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	133.5	177.5	11

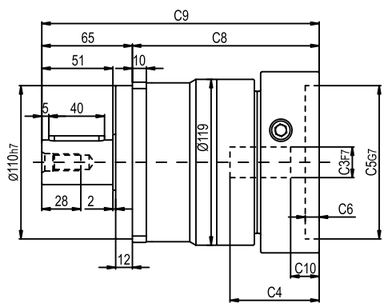
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / DIMENSION SHEET

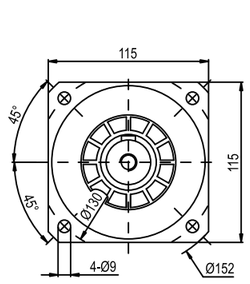
FB-115D(M1)-L1

输入端/INPUT



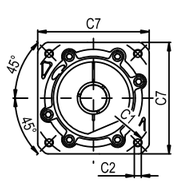


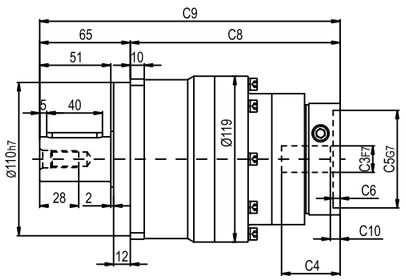
输出端/ OUTPUT



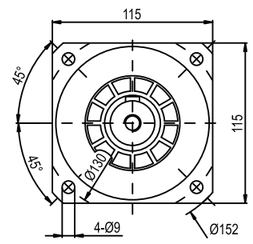
FB-115D(M1)-L2

输入端/ INPUT

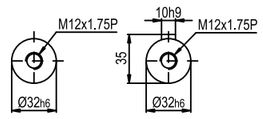




输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1 shaft　　轴型式 S2 shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-115D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	134	199	19.5
FB-115M1-L1	Ø200	4-M12x28	Ø35	81	Ø114. 3	10	180	151.5	216.5	28
FB-115D-L2	Ø90	4-M5x12 , 4-M6x14	Ø19	42	Ø70	6.5	80	150.5	215.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	150.5	215.5	6
FB-115M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	166	231	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	168.5	233.5	19

* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

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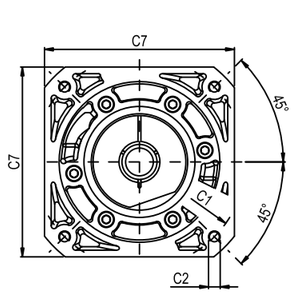
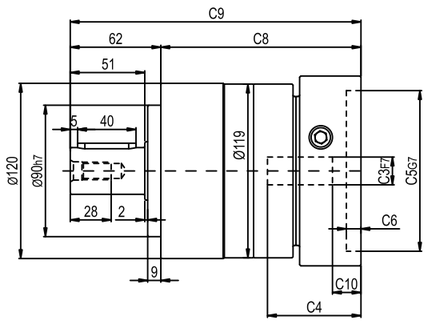
外形尺寸图表 / DIMENSION SHEET

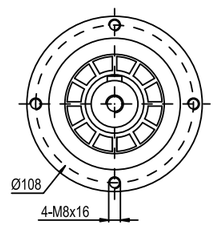
FE-120D(M1)-L1

输入端 / INPUT



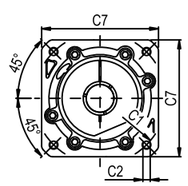


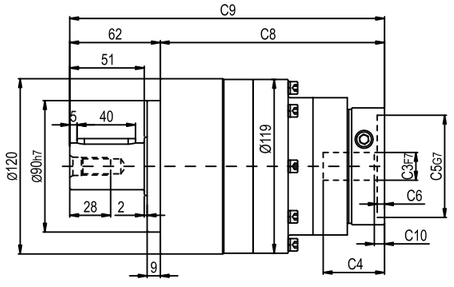
输出端 / OUTPUT



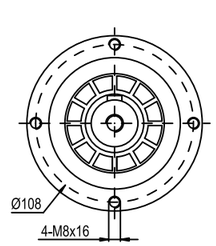
FE-120D(M1)-L2

输入端 / INPUT

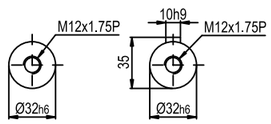




输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1 shaft　　轴型式 S2 shaft

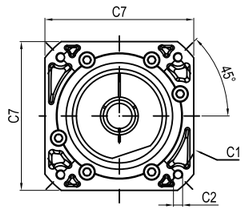
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-120D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	137	199	19.5
FE-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114. 3	10	180	154.5	216.5	28
FE-120D-L2	Ø90	4-M5x12 , 4-M6x14	Ø19	42	Ø70	6.5	80	153.5	215.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	153.5	215.5	6
FE-120M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	169	231	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	171.5	233.5	19

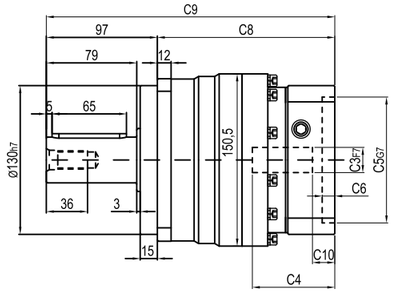
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / DIMENSION SHEET

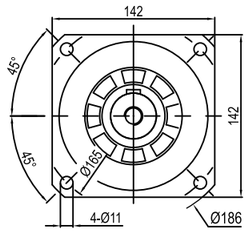
FB-142D(M1)-L1

输入端/ INPUT



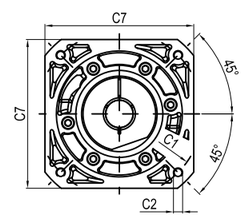


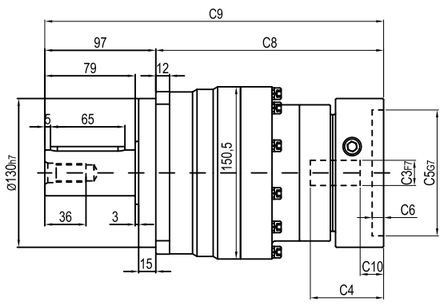
输出端/OUTPUT



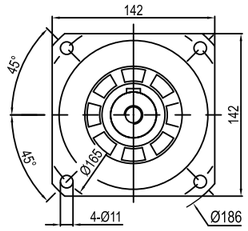
FB-142D(M1)-L2

输入端/ INPUT

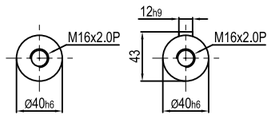




输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1 shaft　　轴型式 S2 shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-142D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	155	252	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	165	262	25
FB-142D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	199	296	19.5
FB-142M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	216.5	313.5	28

* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

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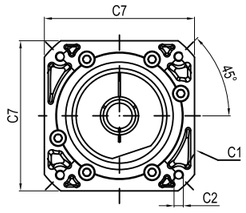
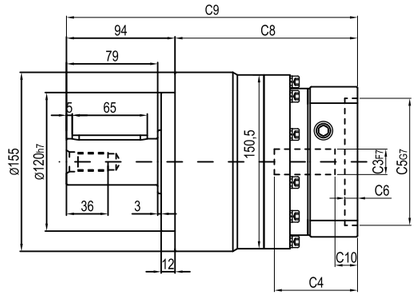
外形尺寸图表 / DIMENSION SHEET

FE-155D(M1)-L1

输入端 / INPUT





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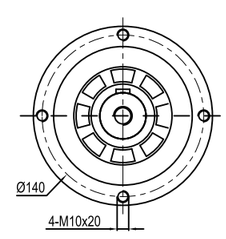
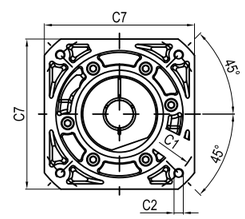
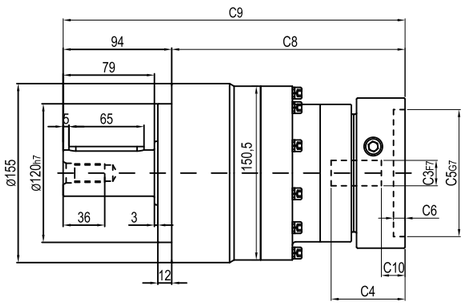


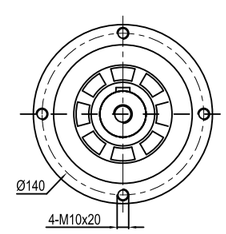
FE-155D(M1)-L2

输入端 / INPUT

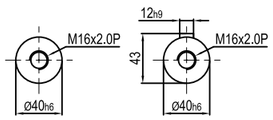




输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1 shaft　　轴型式 S2 shaft

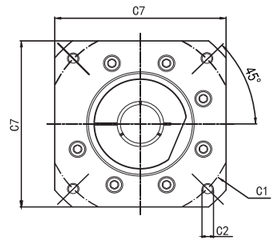
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-155D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	158	252	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	168	262	25
FE-155D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	202	296	19.5
FE-155M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	219.5	313.5	28

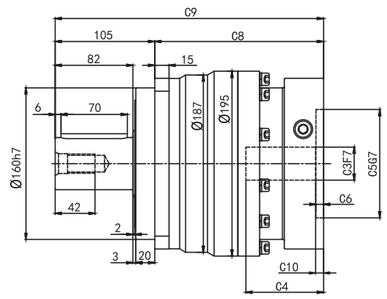
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / DIMENSION SHEET

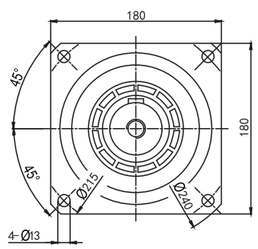
FB-180D-L1

输入端 / INPUT



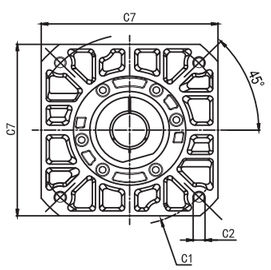


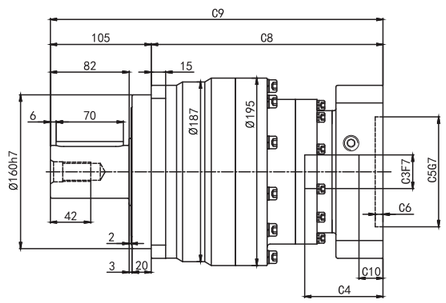
输出端 / OUTPUT



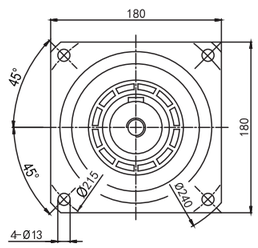
FB-180D-L2

输入端 / INPUT

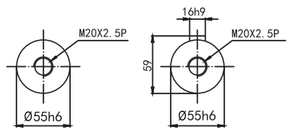




输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1 shaft　　轴型式 S2 shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-180D-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	178	283	8.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	213.5	318.5	45.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	183	288	13.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	213.5	318.5	45.5
FB-180D-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	231	336	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	241	346	25

* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

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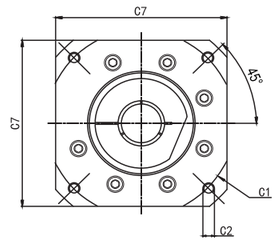
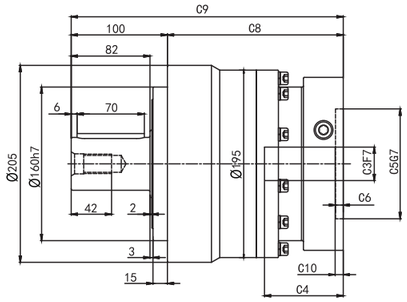
外形尺寸图表 / DIMENSION SHEET

FE-205D-L1

输入端 / INPUT





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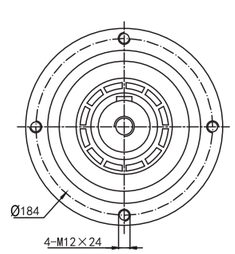

FE-205D-L2

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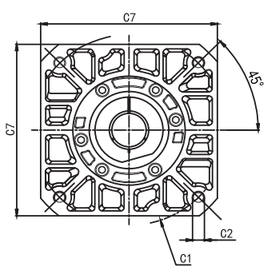

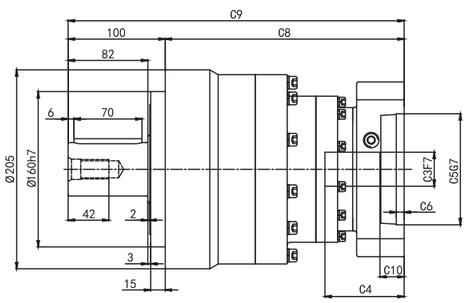

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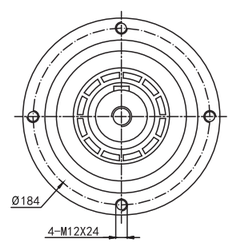
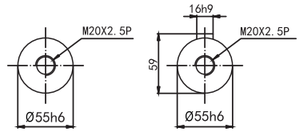


输出轴径/Output Diameter



轴型式 S1 shaft　　轴型式 S2 shaft

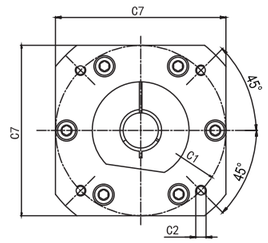
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-205D-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	183	283	8.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	218.5	318.5	45.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	188	288	13.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	218.5	318.5	45.5
FE-205D-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	236	336	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	246	346	25

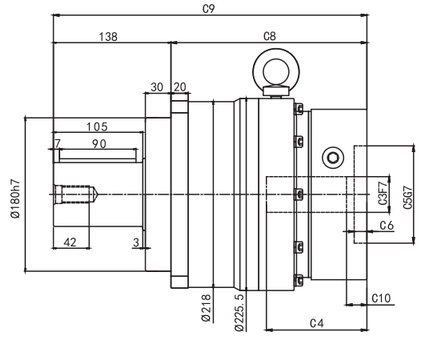
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / DIMENSION SHEET

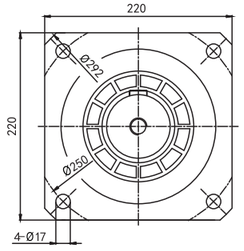
FB-220D-L1

输入端 / INPUT



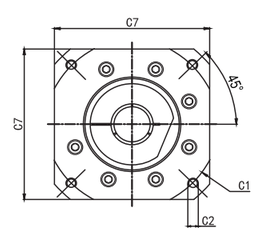


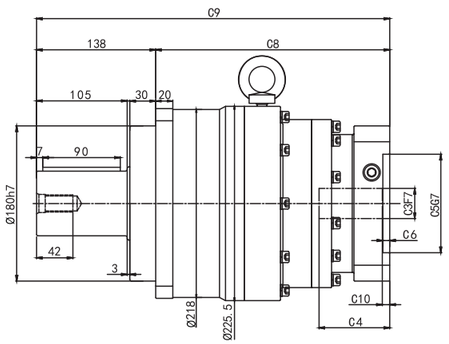
输出端 / OUTPUT



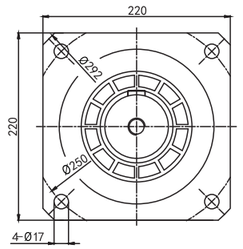
FB-220D-L2

输入端 / INPUT

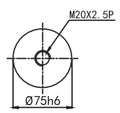




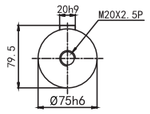
输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft



轴型式 S2
shaft

尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-220D-L1	Ø200	4-M12x28	Ø35,Ø42	118	Ø114.3	15	200	230	368	24
	Ø215	4-M12x30	Ø38	108	Ø180	8	200	220	358	11.5
	Ø235	4-M12x30	Ø42,Ø55	118	Ø200	10	220	230	368	24
FB-220D-L2	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	271.5	409.5	8.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	307	445	45.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	276.5	414.5	13.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	307	445	45.5

* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

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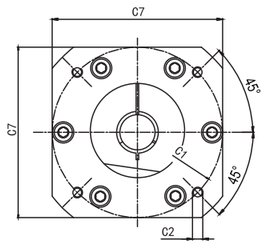
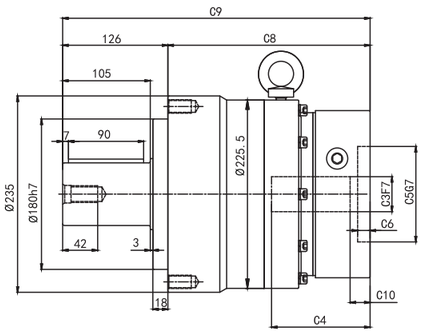
外形尺寸图表 / DIMENSION SHEET

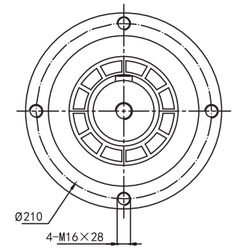
FE-235D-L1

输入端 / INPUT



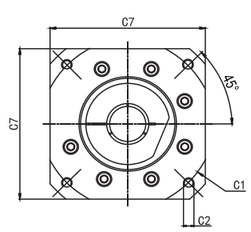


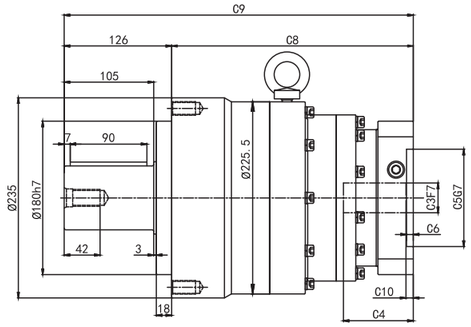
输出端 / OUTPUT



FE-235D-L2

输入端 / INPUT





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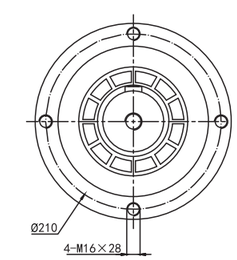
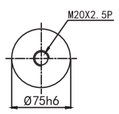
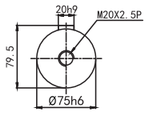


输出轴径/Output Diameter



轴型式 S1
shaft



轴型式 S2
shaft

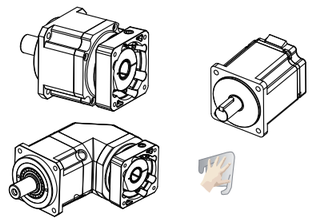
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-235D-L1	Ø200	4-M12x28	Ø35,Ø42	118	Ø114.3	15	200	242	368	24
	Ø215	4-M12x30	Ø38	108	Ø180	8	200	230	358	11.5
	Ø235	4-M12x30	Ø42,Ø55	118	Ø200	10	220	242	368	24
FE-235D-L2	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	283.5	409.5	8.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	319	445	45.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	288.5	414.5	13.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	319	445	45.5

* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

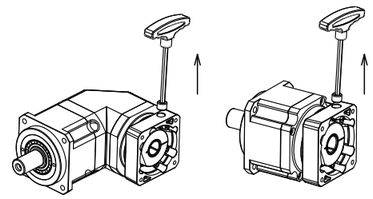
安装说明 / INSTALLATION INSTRUCTIONS

1 减速机外观的确认	Confirm the appearance of the reducer
*请先确认减速机型号是否正确	Please confirm if the reducer model is correct
2 伺服马达的安装	Installation of the servo motor
* 伺服马达的安装根据以下步骤实施	The installation of servo motor according to the following steps
* 请使用根据订单提供的伺服电机进行安装	Please proceed the installation of the servo motor according to the order

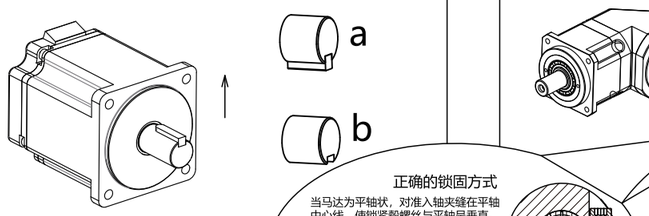
1 确认马达与减速机规格，并将马达及减速机之安装面擦拭干净。
Confirm the specifications of motor and reducer, and wipe the mounting surface of motor and reducer clean.



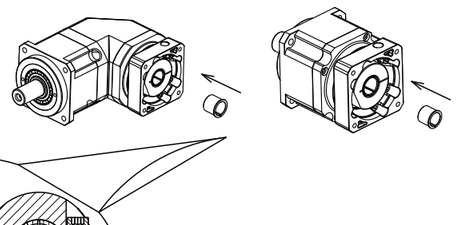
2 将入力法兰侧孔堵头螺丝取出，转动马达锁紧毂，直到锁紧毂螺丝对准法兰侧孔。
Take the plug screw out of the flange side hole,and rotate the motor locking hub until the locking hub screw is aligned with the flange side hole.



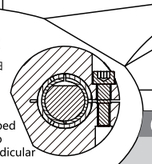
3 取下马达上原先之平键；如有必要，请安装平衡键。
Remove the original flat key from the motor; If necessary, install the balance key.



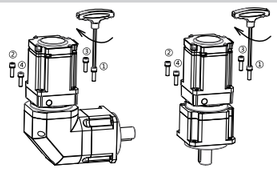
4 确认马达轴心尺寸，若有必要，装上轴套。
Confirm the axis size of the motor and install the sleeve if necessary.



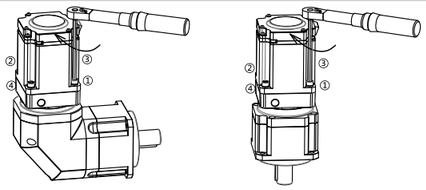
正确的锁固方式
当马达为平轴状，对准入轴夹缝在平轴中心线，使锁紧毂螺丝与平轴呈垂直。
Correct locking method
When the motor is in the shape of a flat shaft, the opposite shaft is clamped on the center line of the flat shaft, so that the locking hub screw is perpendicular to the flat shaft.



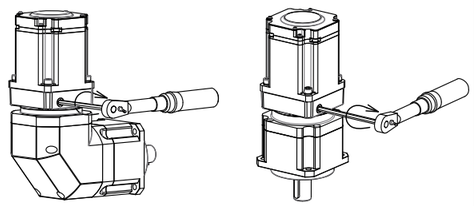
5 直立式的装入马达，以螺丝扭力表（表一）建议扭力值之5%，依1~4顺序，用扳手将附垫片之螺丝轻轻锁上。
Install the motor in a vertical position, and use a wrench to gently lock the screws with gasket according to the order of 1 ~ 4 with 5% of the recommended torque value in the screw torque table (Table 1).



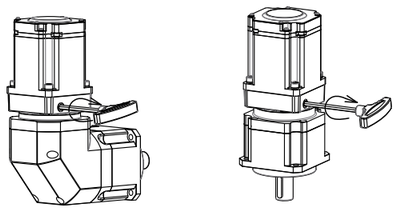
6 将马达与减速机直立摆设，以螺丝扭力表（表一）建议扭力值，依1~4的顺序，用扭力扳手将螺丝锁紧。
Place the motor and reducer vertically.Lock the screws with torque wrench in the order of 1~4,according to the recommended torque value in the screw torque table(Table 1).



7 参照表二建议之扭力值，用扭力扳手将马达锁紧毂螺丝锁紧。
According to the recommended torque value in Table 2,lock the locking hub screw with torque wrench.



8 锁回法兰侧孔堵头螺丝。
Lock the flange side hole plug screw.



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安装说明 / INSTALLATION INSTRUCTIONS

表一 马达锁紧螺丝扭力建议表 Suggested torque table for motor locking screws

螺丝尺寸	六角头尺寸 Hexagon head size	强度8.8 Strength 8.8		强度10.9 Strength 10.9		强度12.9 Strength 12.9	
	[mm]	[Nm]	[In-lbs]	[Nm]	[In-lbs]	[Nm]	[In-lbs]
M3x0.5P	2.5	1.3	12	1.8	16	2.1	19
M4x0.7P	3	3	27	4.1	37	4.9	44
M5x0.8P	4	6.1	55	8.2	73	9.8	87
M6x1P	5	11	98	14	124	17	151
M8x1.25P	6	25	222	34	302	41	364
M10x1.5P	8	49	434	67	594	80	709
M12x1.75P	10	85	753	116	1028	139	1232
M14x2P	12	137	1214	186	1648	223	1976
M16x2P	14	210	1860	286	2534	343	3038

表二 减速机锁紧螺丝扭力建议表 Suggested torque table for the locking screw of the gearbox

减速机型号 Reducer model		马达轴径 Motor shaft diameter	螺丝尺寸 Screw Size	六角头尺寸 Hexagon head size	锁紧扭力 Locking torque	
		[mm]	[mm]	[mm]	[Nm]	[In-lbs]
FAB042 FABR042 FAD047 FADR047 FB042 FG040 FGA040	单级 Single stage	≤12	M3x0.5Px10L	2.5	2.1	19
	双级 Dual stage	≤12	M3x0.5Px10L	2.5	2.1	19
FAB060 FABR060 FAD064 FADR064 FB060 FBR060 FE070 FER070 FG060 FGA060 FGR060 FGAR060	单级 Single stage	≤19	M5x0.8Px14L	4	9.8	87
	双级 Dual stage	≤19	M5x0.8Px14L	4	9.8	87
FAB090 FABR090 FAD090 FADR090 FB090 FBR090 FE090 FER090 FG080 FGA080 FGR080 FGAR080	单级 Single stage	≤24	M6x1Px20L	5	17	151
	双级 Dual stage	≤19	M5x0.8Px14L	4	9.8	87
FAB115 FABR115 FAD110 FADR110 FB115 FBR115 FE120 FER120 FG120 FGR120 FGA120 FGAR120	单级 Single stage	≤35	M8x1.25Px25L	6	41	364
	双级 Dual stage	≤24	M6x1Px20L	5	17	151
FAB142 FABR142 FAD140 FADR140 FB142 FBR142 FE155 FER155 FG160 FGR160 FGA160 FGAR160	单级 Single stage	≤38	M10x1.5Px30L	8	80	709
	双级 Dual stage	≤35	M8x1.25Px25L	6	41	364
FAB180 FABR180 FAD200 FADR200 FB180 FE205	单级 Single stage	≤50	M12x1.75Px35L	10	139	1232
	双级 Dual stage	≤38	M10x1.5Px30L	8	80	709
FAB220 FABR220 FAD255 FADR255 FE235 FB220	单级 Single stage	≤55	M16x2Px40L	14	343	3038
	双级 Dual stage	≤50	M12x1.75Px35L	10	139	1232

备注：螺丝锁紧扭力必须大于上述值。若有需要时，可将锁紧扭力多增加上述建议值之20%，以避免打滑。
Note: The screw tightening torque must be greater than the above value. If necessary, the tightening torque can be increased by 20% of the above recommended value to avoid slipping.