致力于减速机行业16年，售后无忧！

TECHNOLOGY DRIVE
IN THE FUTURE

上海承禹机电设备备有限公司

上海承禹机电设备有限公司
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FLIKS

QUALITY ASSURANCE POWER PEAK

行星减速机（斜齿系列）

PLANETARY REDUCER

TECHNOLOGY
DRIVE IN THE FUTURE

更高精度 高稳定性

COMPANY INTRODUCTION

企业介绍

上海承禹机电设备有限公司是一家新锐传动系统制造商，专注研发高精密齿轮传动装置，10多年来，承禹公司以其先进技术和独特的产品系列、资深的行业经验以及广泛的服务网络成为了行业先锋。今天全球数以万计的机械专业设计者在使用公司的产品，极大的提高了各类工业设备和传动控制系统的生产、设计效率。

上海承禹公司的FAB、FVB、FTP等系列产品，以其强大功能和庞大的用户基础，成为全球精密传动领域的标准。我们以高度模块化和标准化的产品、以本地化生产和就近化服务为理念，依靠优质的供应链及制造标准、充裕的库存保证、快速的交货能力和及时的售后处理，为客户提供“长、快、高、多、优”的贴心服务。

上海承禹公司以市场为中心，人人心中有市场，建立了完善的销售体制；世界范围内包括西门子SIEMENS电机，ABB电机，YASKAWA安川电机，Panasonic松下电机，宝钢、HIIMA、拜尔、巴斯夫，吉特迈、菲利普莫里斯、英美烟草，虹霓等诸多著名的跨国公司都广泛选用了承禹公司的产品，从而保证了机械设备的高稳定性和使用寿命。

以完善的传动解决方案，积极服务于“港口、电力、有色、化工、石油、环保、造纸、钢铁、金属加工、建筑建材、橡胶塑料、机床、医疗、电子制造设备、纺织、食品饮料、电商物流、机场分拣、舞台、游艺”等各个领域，在中国，承禹公司的产品已被多家大型企业如宝钢，攀钢、沙钢、 BYD、BOE、奇瑞汽车、上汽集团，中烟集团，中集集团，徐锻集团，三一重工，天正，北车集团，南方电网，中国印钞造币总公司等广泛采用，在多项重大工程项目中也得到应用，如上海磁悬浮列车、深圳地铁、上海地铁、高沪高速列车、贵广直流输电工程、上海世博会和北京奔驰汽车厂等等，为客户创造价值。

我们凭借十余年的行业经验以及专业积淀，根据曾经数不胜数的各种产品案例，反复推敲、设计、模拟、试验，从而创造最卓越的产品，这些产品将广泛应用于工业、工程等各个领域，改善并提高人们的工作效率。

在未来，我们将围绕客户设备，通过与客户深度沟通以及紧密合作，为客户提供更符合设备要求、更具有高性价比的产品，以制造中国最高标准的减速机产品为己任，努力成为技术领先的传动产品专业制造商。

Shanghai Chengyu Electromechanical Equipment Co., Ltd. is a cutting-edge manufacturer of transmission systems, focusing on the research and development of high-precision gear transmission devices. For more than 10 years, Chengyu Company has become a pioneer in the industry with its advanced technology, unique product series, senior industry experience, and extensive service network. Today, tens of thousands of mechanical designers worldwide are using the company's products, greatly improving the production and design efficiency of various industrial equipment and transmission control systems.

The FAB, FVB, FTP and other series products of Shanghai Chengyu Company have become the standard in the global precision transmission field due to their powerful functions and large user base. We adhere to the concept of highly modular and standardized products, localized production and nearby services, relying on high-quality supply chain and manufacturing standards, abundant inventory guarantee, fast delivery capacity, and timely after-sales treatment to provide customers with "long, fast, high, many, and excellent"thoughtfulservices.

Shanghai Chengyu Company takes the market as the center, and everyone has a market in their hearts, establishing a sound sales system; Many famous multinational companies around the world, including Siemens SIEMENS motors, ABB motors, YASKAWA Yaskawa motors, Panasonic motors, Baosteel, HIIMA, Bayer, BASF, Geely, Philips Morris, British American Tobacco, Rainbow, etc., have widely used products from Chengyu Company, ensuring high stability and service life of mechanical equipment.

With comprehensive transmission solutions, Chengyu Company actively serves various fields such as ports, electricity, non-ferrous metals, chemicals, petroleum, environmental protection, papermaking, steel, metal processing, building materials, rubber and plastics, machine tools, medical, electronic manufacturing equipment, textiles, food and beverage, e-commerce logistics, airport sorting, stage, and entertainment. In China, Chengyu Company's products have been widely adopted by many large enterprises such as Baosteel, Panzhihua Iron and Steel, Shagang, BYD, BOE, Chery Automobile, SAIC Group, China Tobacco Group, CIMC Group, Xuforging Group, Sany Heavy Industry, Tianzheng, CRRC Group, Southern Power Grid, and China National Currency Printing and Minting Corporation, and have been widely adopted in multiple major projects. It has also been applied in engineering projects, such as Shanghai maglev trains, Shenzhen subways, Shanghai subways, high-speed trains, Guiguang DC transmission projects, Shanghai World Expo, and Beijing Mercedes Benz factory, to create value for customers.
We rely on more than ten years of industry experience and professional accumulation, and based on countless product cases, we repeatedly analyze, design, simulate, and test to create the most outstanding products. These products will be widely used in various fields such as industry and engineering, improving and enhancing people's work efficiency.

In the future, we will focus on customer equipment and provide customers with products that better meet equipment requirements and have high cost-effectiveness through deep communication and close cooperation. Our responsibility is to manufacture the highest standard reducer products in China and strive to become a leading professional manufacturer of transmission products.

PRODUCTION ENVIRONMENT

生产环境

PRODUCTION ENVIRONMENT

生产环境

CONTENTS 目录

产品系列简介 / PRODUCT SERIES INTRODUCTION

FAB Series

7种可选尺寸		42mm—220mm
额定输出力矩		14Nm—2000Nm
减速比	单 级	3/4/5/6/7/8/10
	双 级	12/15/20/25/30/35 40/50/60/70/80/100
背 隙	单 级	≤1,≤3,≤5 arcmin
	双 级	≤3,≤5,≤7 arcmin

FABR Series

7种可选尺寸		42mm—220mm
额定输出力矩		14Nm—2000Nm
减速比	单 级	3/4/5/6/7/8/10/14/20
	双 级	12/15/20/25/30/35/40/50/60 70/80/100/120/140/160/200
背 隙	单 级	≤2,≤4,≤6 arcmin
	双 级	≤4,≤7,≤9 arcmin

FAD Series

7种可选尺寸		47mm — 255mm
额定输出力矩		14Nm — 2000Nm
减速比	单 级	4/5/6/7/8/10
	双 级	20/25/35/40/50/60 70/80/100
背 隙	单 级	≤1,≤3,≤5 arcmin
	双 级	≤3,≤5,≤7 arcmin

FADR Series

7种可选尺寸		47mm — 255mm
额定输出力矩		14Nm— 2000Nm
减速比	单 级	4/5/6/7/8/10/14/20
	双 级	20/25/35/40/50/60/70 80/100/120/140/160/200
背 隙	单 级	≤2,≤4,≤6 arcmin
	双 级	≤4,≤7,≤9 arcmin

FB Series

7种可选尺寸		42mm—220mm
额定输出力矩		14Nm—2000Nm
减速比	单 级	3/4/5/6/7/8/10
	双 级	12/15/20/25/30/35 40/50/60/70/80/100
背 隙	单 级	≤5 arcmin
	双 级	≤7 arcmin

FBR Seies

4种可选尺寸		60mm-142mm
额定输出力矩		40Nm-650Nm
减速比	单 级	3/4/5/6/7/8/10/14/20
	双 级	12/15/20/25/30/35 40/50/60/70/80/100 120/140/160/200
背 隙	单 级	10arcmin
	双 级	12arcmin

FLIKS
传动装置专业制造商
PROFESSIONAL MANUFACTURER OF TRANSMISSION DEVICE
行星系列

产品系列简介 / PRODUCT SERIES INTRODUCTION

FE Series

6种可选尺寸		70mm—235mm
额定输出力矩		40Nm—2000Nm
减速比	单 级	3/4/5/6/7/8/10
	双 级	12/15/20/25/30/35 40/50/60/70/80/100
背 隙	单 级	≤5 arcmin
	双 级	≤7 arcmin

FER Seies

4种可选尺寸		70mm-155mm
额定输出力矩		40Nm-650Nm
减速比	单 级	3/4/5/6/7/8/10/14/20
	双 级	12/15/20/25/30/35/40/50/60 70/80/100/120/140/160/200
背 隙	单 级	10arcmin
	双 级	12arcmin

FG Seies

10种可选尺寸		40mm—160mm
额定输出力矩		14Nm—650Nm
减速比	单 级	3/4/5/6/7/8/10
	双 级	12/15/20/25/30 35/40/50/60/70/80/100
背 隙	单 级	≤8 arcmin
	双 级	≤10 arcmin

FGR Seies

4种可选尺寸		60mm-160mm
额定输出力矩		40Nm-650Nm
减速比	单 级	3/4/5/6/7/8/10/14/20
	双 级	12/15/20/25/30/35 40/50/60/70/80/100 120/140/160/200
背 隙	单 级	13arcmin
	双 级	15arcmin

FGA Seies

10种可选尺寸		40mm—160mm
额定输出力矩		14Nm—650Nm
减速比	单 级	3/4/5/6/7/8/10
	双 级	12/15/20/25/30 35/40/50/60/70/80/100
背 隙	单 级	≤8 arcmin
	双 级	≤10 arcmin

FGAR Seies

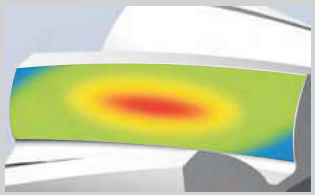
4种可选尺寸		60mm-160mm
额定输出力矩		40Nm-650Nm
减速比	单 级	3/4/5/6/7/8/10/14/20
	双 级	12/15/20/25/30/35 40/50/60/70/80/100 120/140/160/200
背 隙	单 级	13arcmin
	双 级	15arcmin

产品特性 / PRODUCTS FEATURES

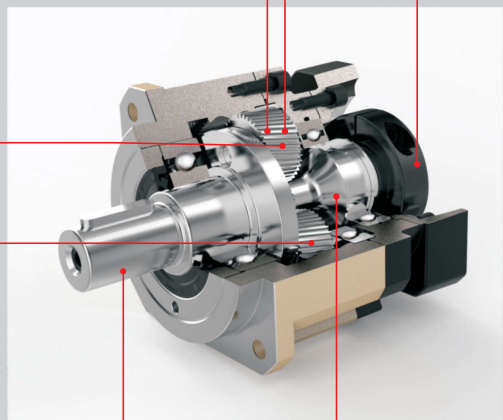
行星齿轮的传动介面采用**不含保持架之满滚针设计**，增加接触面积以提高结构刚性及输出扭矩。

减速机构采用螺旋齿轮设计，其齿形啮合率为一般正齿轮的两倍以上，具有运转平顺、低噪音、高输出扭矩和低背隙的特性。

输入轴与马达的连接采用筒夹式的锁紧机构并经动平衡分析，以确保在高输入转速下接口的同心度和零背隙的动力传递。



利用ANSYS技术对齿轮强度**进行有限元分析**，同时对齿面作**齿形及导程修整**，以减低齿轮啮合的冲击和噪音，增加齿轮系的使用寿命。



齿轮材料采用**优质合金钢**，经**碳-氮共渗处理**，从而获得最佳的耐磨性和耐冲击韧性。

行星架与输出轴采用一体式双支撑的结构设计，确保最大的扭转刚性。

太阳齿轮与输入轴采用一体式的结构设计，确保最大的扭转刚性及高输入转速下的零背隙动力传递。

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: Backlash is under 1 arcmin.Backlash for 2-stage speed reduction is within 3 arcmin.
3.High Efficiency: Efficiency for 1-stage model exceeds 95% ,For 2-stage model exceeds 92%.
4.High Input Speed: Input speed allows for up to 8000 RPM.
5.High Torque: Higher torque output than that of conventional planetary gear reducers.
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 deign.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 domain:
1. Aerospace, military industry.
2. Medical health, electronic information industry.
3. Industrial robots, Production automation, CNC machine tool manufacturing industry.
4. Motor, textile, printing, food, metallurgical, environmental protection engineering, warehouse logistics industr.

减速机的选用及注意事项 / GEAR UNIT 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

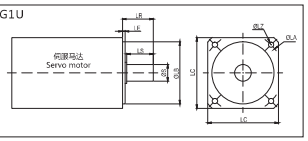
步骤	说明	代号	参数计算						
1	设备使用系数	f_1	Loading classification 负载类型	Running per hour 每小时启动次数Z	Using fs 使用系数fs				
					Running per day(h) 每日运行时间（h）				
					h<4	4<h<8	8<h<12	12<h<16	16<h<24
			Uniform 均匀负载	Z<10	0.85	0.95	1.00	1.20	1.60
				10<Z<30	0.90	1.10	1.15	1.40	1.80
				30<Z<100	1.00	1.20	1.30	1.60	2.00
			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fs-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	$P_1=(T_2\times n_1)/(9550\times i\times\eta)$ 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	

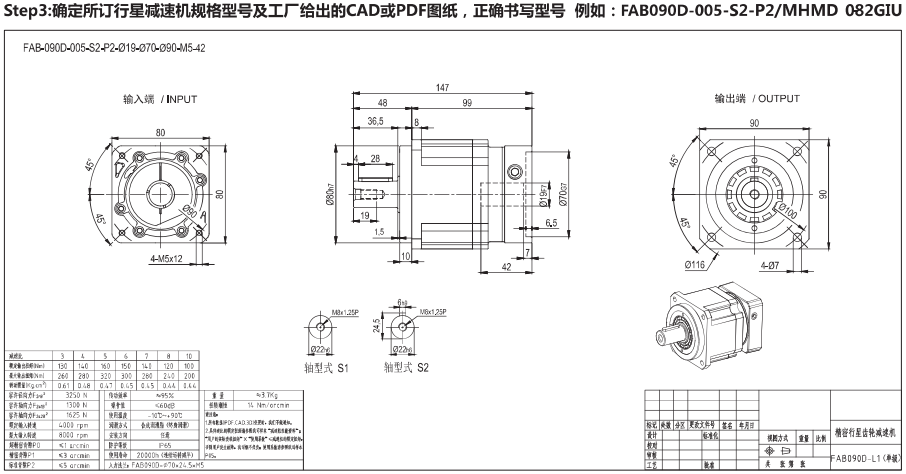


Notice for ordering 订货须知

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：
Mounting position&others requir:
外形及安装方式方面特殊要求：
Backlash:
实际等级：

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

FAB-090D-005-S2-P2-Ø19-Ø70-Ø90-M5-42



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

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

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。

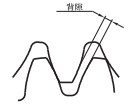
Precise positioning 定位精度

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。

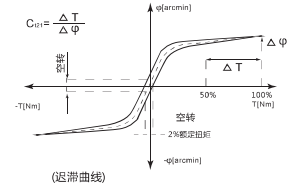
Backlash 回程间隙背隙

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仍差角，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 UNIT SELECTION & ANNOUNCEMENTS

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

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$T_{2HOT}=2\cdot T_{2B}$　FAB180以上机型为$T_{2HOT}=1.5\cdot T_{2B}$)
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。$C_{t21}=\Delta T/\Delta$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。

FAB
SERIES

型号说明 / MODEL ILLUMINATE

FAB 090 – 10 – S2 – P2 / 马达

减速机型式：
FAB042/FAB060/FAB090
FAB115/FAB142/FAB180/FAB220

输出轴型式选择：S1：平滑直轴
S2：附件直轴

马达型号：
马达制造及型号

减速比：单级(L1)：3,4,5,6,7,8,10
双级(L2)：12,15,20,25,30,35,40,50,60,70,80,100

背隙：P0：超精密背隙
P1：精密背隙
P2：标准背隙

选用范例：FAB090-10-S2-P2/MHMD-082G1U

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

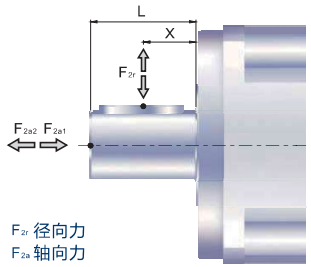
规 格		级 数	减速比[1]	FAB042	FAB060	FAB090	FAB115	FAB142	FAB180	FAB220
转动惯量J_1	kg·cm²	1	3	0.03	0.16	0.61	3.25	9.21	28.98	69.61
			4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
			5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
			6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
			7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
			8	0.03	0.13	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（$i=N_{in}/N_{out}$）
* 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。

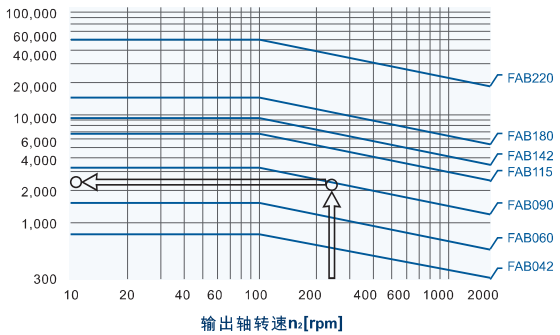
减速机输出轴之容许径向力及轴向力

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



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。

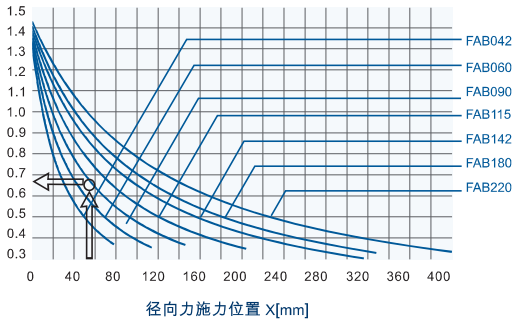
容许径向力 F_{2rB}[N] 施力于轴中心位置



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



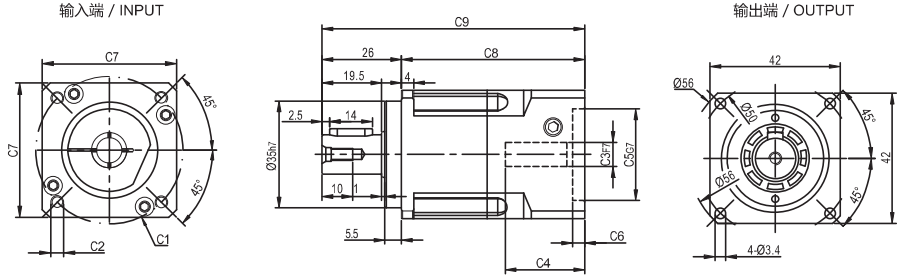
当径向力F_{2r}施力不在轴中心位置时，越靠近减速机即X＜1/2xL，所能承受之容许径向力变大，越远离减速机即X＞1/2xL时，所能承受之容许径向力则变小，藉由左图，依减速机规格及径向力施力位置X，查出位置负荷洗漱K_b，在代入下列公式，求出容许
径向力：
$F'_{2rB}=KbxF_{2rB}$
轴向力:
$F'_{2a1B}=0.2xF'_{2rB}$
$F'_{2a2B}=0.1xF'_{2rB}$

＊连续运转降低使用寿命二分之一。

外形尺寸图表 / OUTLINE DIMENSION SHEET

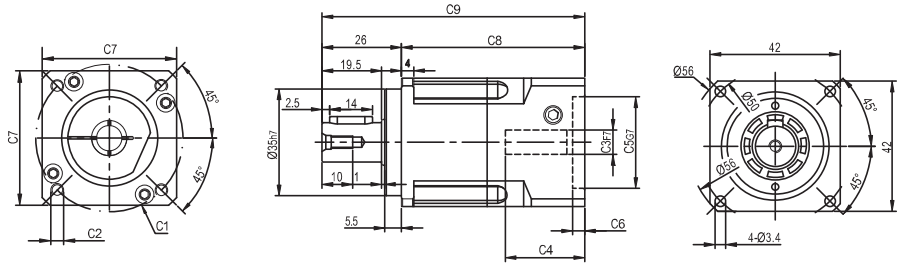
FAB-042D-L1

输入端 / INPUT　　输出端 / OUTPUT

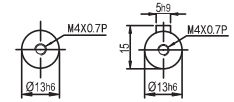


FAB-042D-L2

输入端 / INPUT　　输出端 / OUTPUT



输出轴径/Output Diameter



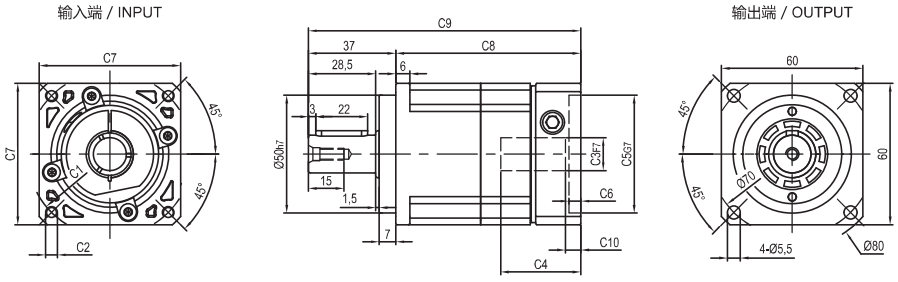
轴型式 S1　　轴型式 S2

尺寸	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							

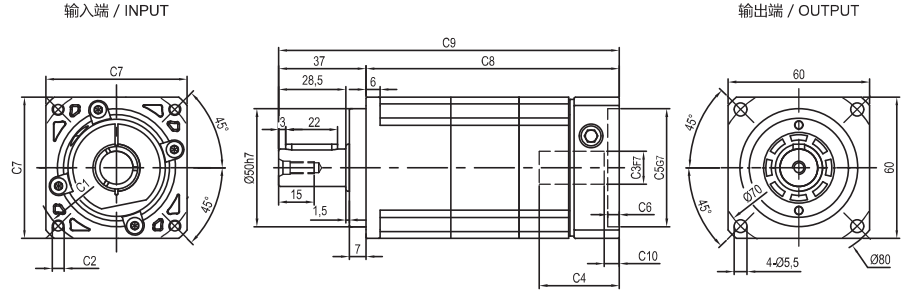
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised.
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

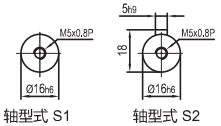
FAB-060D(M1)-L1



FAB-060D(M1)-L2



输出轴径/Output Diameter



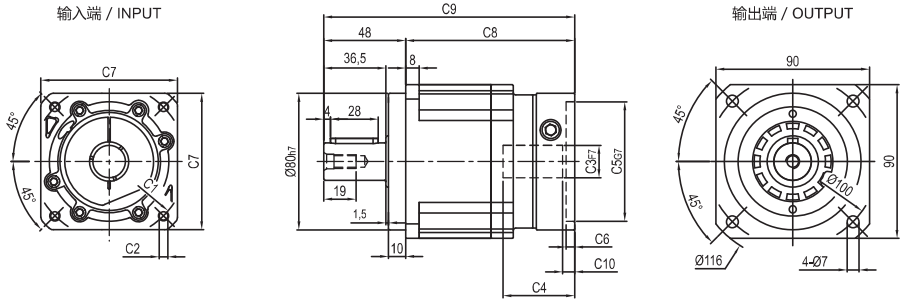
轴型式 S1　　轴型式 S2

尺寸	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

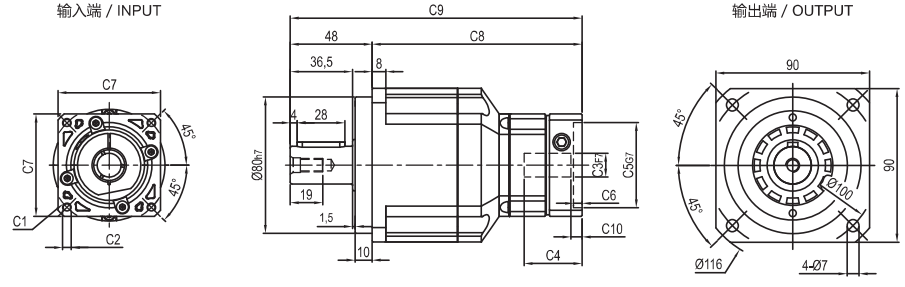
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised.
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

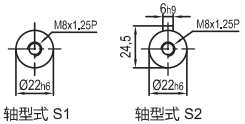
FAB-090D(M1)-L1



FAB-090D(M1)-L2



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

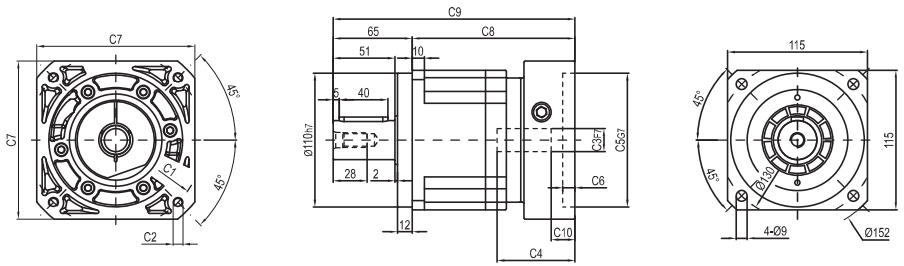
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	99	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	99	147	6
FAB-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	114.5	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	117	165	19
FAB-090D-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	123	171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

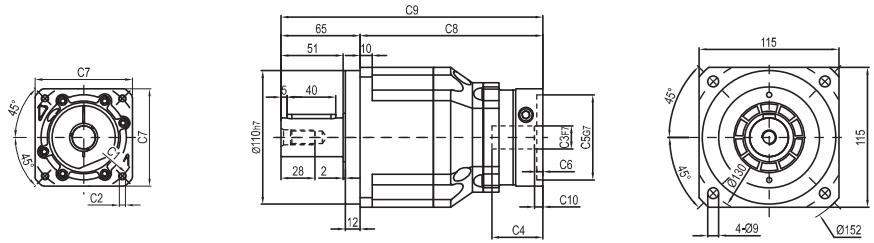
FAB-115D(M1)-L1

输入端 / INPUT　　输出端 / OUTPUT

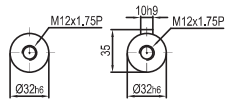


FAB-115D(M1)-L2

输入端/ INPUT　　输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

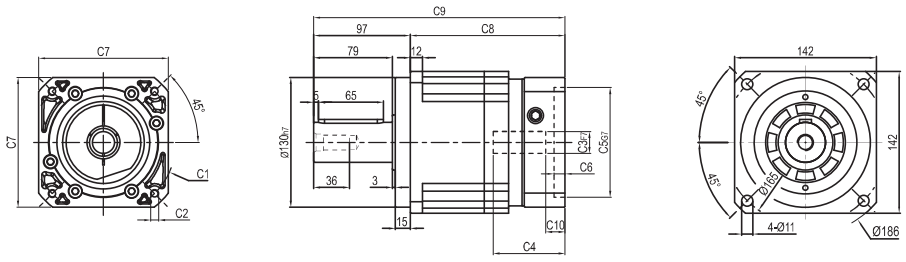
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-115D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	134	199	19.5
FAB-115M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	151.5	216.5	28
FAB-115D-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	150.5	215.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	150.5	215.5	6
FAB-115M1-L2	Ø115	4-M8x20	Ø19,Ø22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

外形尺寸图表 / OUTLINE DIMENSION SHEET

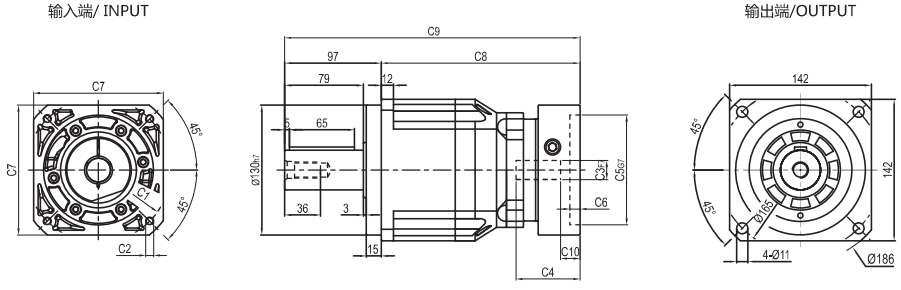
FAB-142D(M1)-L1

输入端/ INPUT　　输出端/OUTPUT

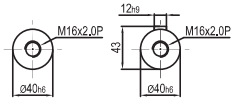


FAB-142D(M1)-L2

输入端/ INPUT　　输出端/OUTPUT



输出轴径/Output Diameter



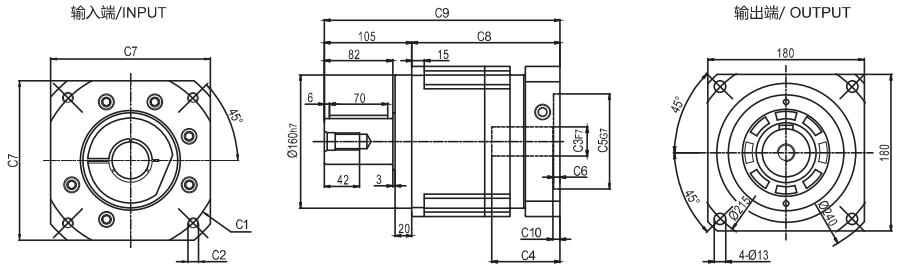
轴型式 S1　　轴型式 S2

尺寸	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

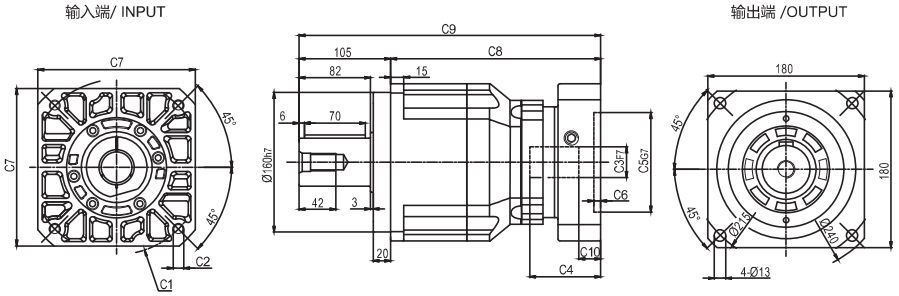
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

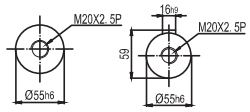
FAB-180D-L1



FAB-180D-L2



输出轴径/Output Diameter



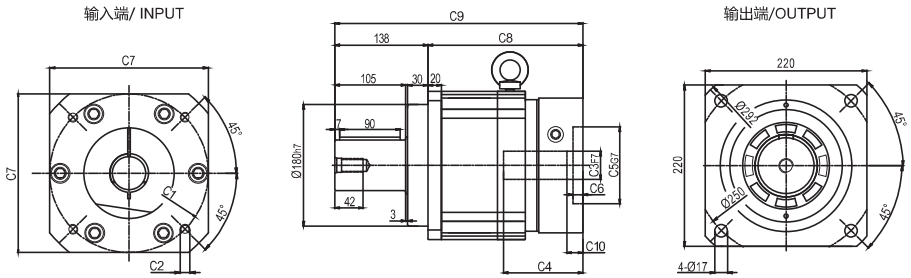
轴型式 S1　　轴型式 S2

尺寸	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

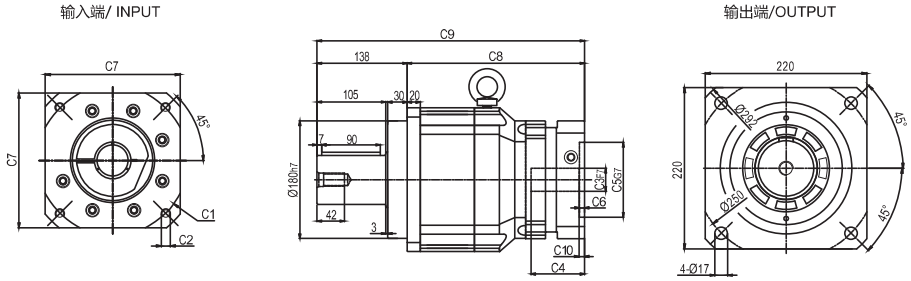
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

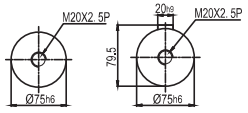
FAB-220D-L1



FAB-220D-L2



输出轴径/Output Diameter

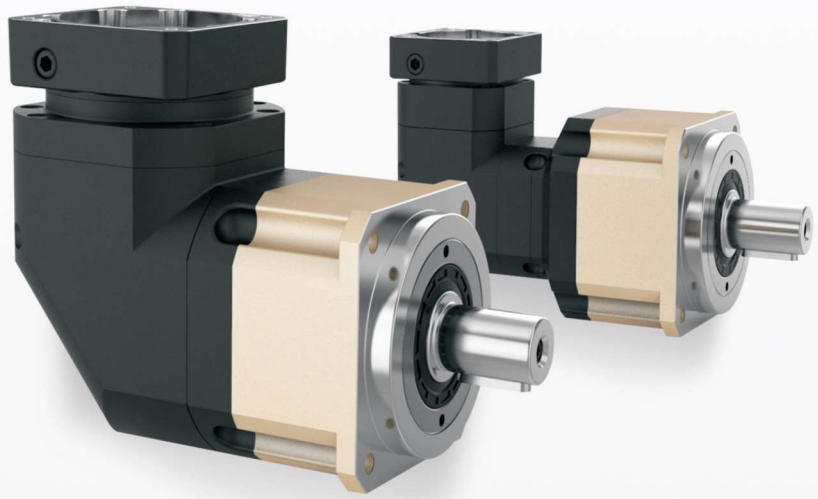


轴型式 S1　　轴型式 S2

尺寸	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。
* 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

FABR
SERIES



型号说明 / MODEL ILLUMINATE

FABR 090 – 10 – S2 – P2 / 马达

- FABR 090：减速机型式：FABR042/FABR060/FABR090 FABR115/FABR142/FABR180/FABR220
- S2：输出轴型式选择：S1：平滑直轴 S2：附件直轴
- P2：背隙：P0：超精密背隙 P1：精密背隙 P2：标准背隙
- 马达：马达型号：马达制造及型号
- 10：减速比：单级(L1)：3,4,5,6,7,8,10,14,20 双级(L2)：12,15,20,25,30,35,40,50,60,70 80,100,120,140,160,200

选用范例：FABR090-10-S2-P2/MHMD-082G1U

减速机性能资料 / GEAR BOX PERFORMANCE INFORMATION

规 格		级 数	减速比[1]	FABR042	FABR060	FABR090	FABR115	FABR142	FABR180	FABR220
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	50	140	290	542	1,050	1,700
			10	14	60	160	330	650	1,200	2,000
			14	–	50	140	300	550	1,100	1,800
			20	–	40	100	230	450	900	1,500
		2	12	–	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	22	55	150	310	600	1,100	1,900
			70	22	60	160	330	650	1,200	2,000
			80	22	50	140	290	542	1,050	1,700
			100	22	60	160	330	650	1,200	2,000
			120	–	–	150	310	600	1,100	1,900
			140	–	–	140	300	550	1,100	1,800
			160	–	–	120	260	500	1,000	1,600
			200	–	–	100	230	450	900	1,500
最大输出力矩T_{2B}	Nm	1,2	3~200	3倍额定输出力矩						
额定输入转速n_1	rpm	1,2	3~200	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	3~200	10,000	10,000	8,000	8,000	6,000	6,000	4,000
超精密背隙 P0	arcmin	1	3~20	–	–	≤2	≤2	≤2	≤2	≤2
		2	12~200	–	–	≤4	≤4	≤4	≤4	≤4
精密背隙 P1	arcmin	1	3~20	≤4	≤4	≤4	≤4	≤4	≤4	≤4
		2	12~200	≤7	≤7	≤7	≤7	≤7	≤7	≤7
标准背隙 P2	arcmin	1	3~20	≤6	≤6	≤6	≤6	≤6	≤6	≤4
		2	12~200	≤9	≤9	≤9	≤9	≤9	≤9	≤7
扭转刚性	Nm/arcmin	1,2	3~200	3	7	14	25	50	145	225
容许径向力F_{2rB}[2]	N	1,2	3~200	780	1,530	3,250	6,700	9,400	14,500	50,000
容许轴向力F_{2a1B}[2]	N	1,2	3~200	350	630	1,300	3,000	4,000	6,200	35,000
容许轴向力F_{2a2B}[2]	N	1,2	3~200	390	765	1,625	3,350	4,700	7,250	25,000
使用寿命	hr	1,2	3~200	20,000*						
效率 η	%	1	3~20	≤95%						
		2	12~200	≤92%						
重量	kg	1	3~20	0.9	2.1	6.4	13	24.5	51	83
		2	12~200	1.2	2.5	7.8	14.2	27.5	54	95
使用温度	℃	1,2	3~200	-10℃~+90℃						
润滑		1,2	3~200	合成润滑油脂						
防护等级		1,2	3~200	IP65						
安装方向		1,2	3~200	任意方向						
噪音值（n_1=3000rpm）	dB	1,2	3~200	≤61	≤63	≤65	≤68	≤70	≤72	≤74

减速机转动惯量

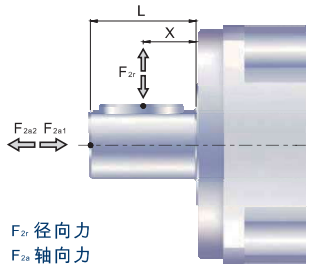
规 格		级 数	减速比[1]	FABR042	FABR060	FABR090	FABR115	FABR142	FABR180	FABR220
转动惯量J_1	kg · cm²	1	3~7	0.09	0.35	2.25	6.84	23.4	68.9	135.4
			8~10	0.09	0.07	1.87	6.25	21.8	65.6	119.8
			14~20	–	0.07	1.87	6.25	21.8	65.6	119.8
		2	12~40	0.09	0.35	0.35	2.25	6.84	23.4	68.9
			50	0.09	0.07	0.31	1.87	6.25	21.8	65.6
			60	0.09	0.07	0.35	2.25	6.84	23.4	68.9
			70~100	0.09	0.07	0.31	1.87	6.25	21.8	65.6
			120~200	–	–	0.31	1.87	6.25	21.8	65.6

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

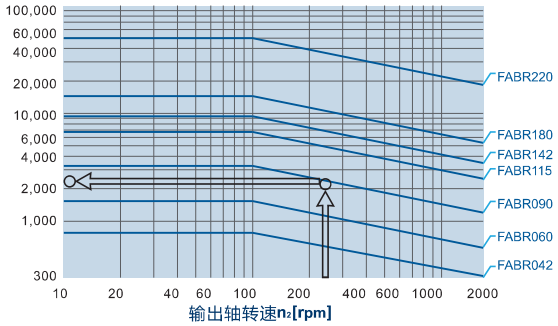
REDUCER OUTPUT SHAFT OF THE PERMISSIBLE RADIAL FORCE AND SHAFT AND FORCE



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.

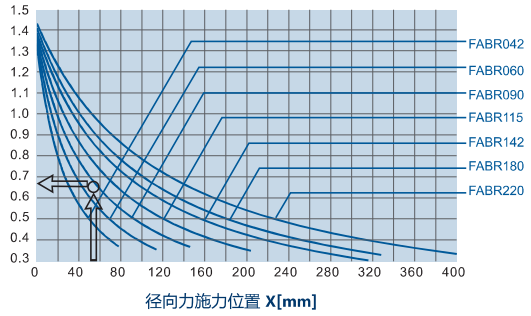
容许径向力 F_{2rB}[N] 施力于轴中心位置



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:

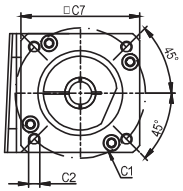
$F'_{2a1B}=0.2xF'_{2rB}$
$F'_{2a2B}=0.1xF'_{2rB}$

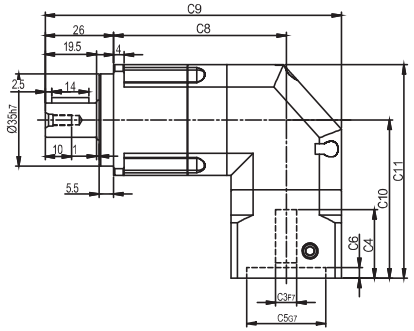
*连续运转降低使用寿命二分之一。

外形尺寸图表 / OUTLINE DIMENSION SHEET

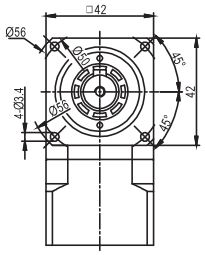
FABR-042D-L1

输入端/INPUT



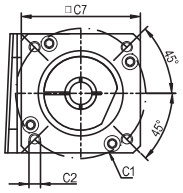


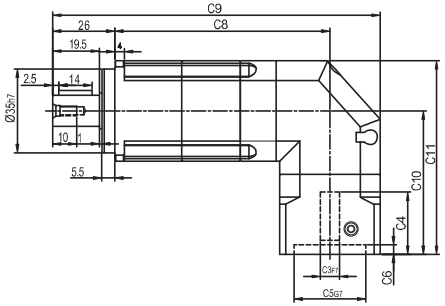
输出端/ OUTPUT



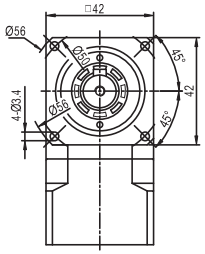
FABR-042D-L2

输入端/ INPUT

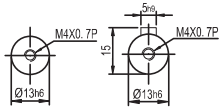




输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FABR-042D-L1	Ø46	4-M4x10	Ø8	26	Ø30	4	42	65.5	112.5	60	81
	Ø45	4-M3x8									
FABR-042D-L2	Ø46	4-M4x10	Ø8	26	Ø30	4	42	90	137	60	81
	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

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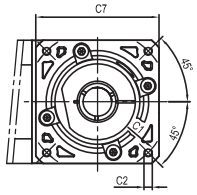
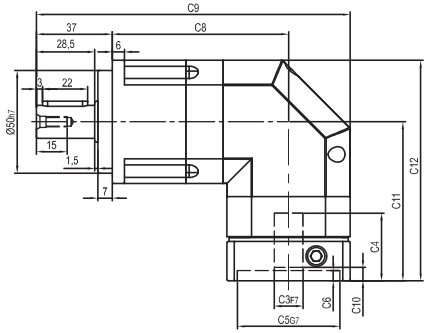
外形尺寸图表 / OUTLINE DIMENSION SHEET

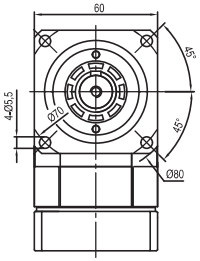
FABR-060D(M1)-L1

输入端/ INPUT



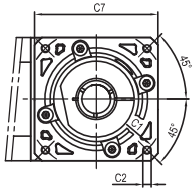


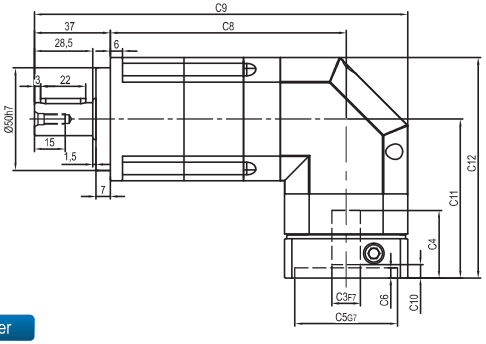
输出端/OUTPUT



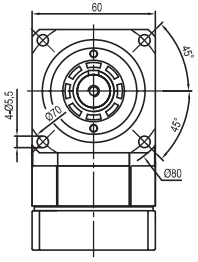
FABR-060D(M1)-L2

输入端/ INPUT

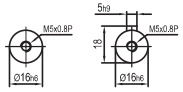




输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

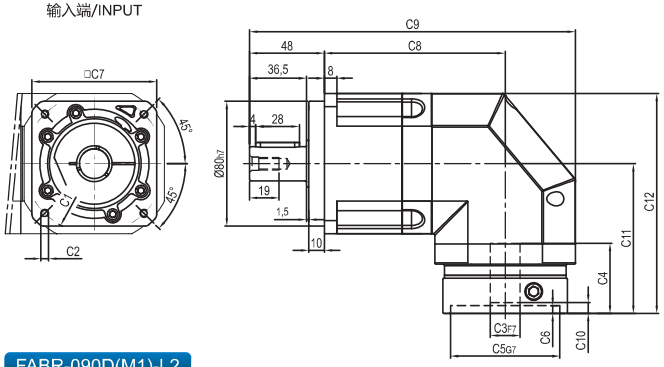
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-060D-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	86	153	5.5	77.5	107.5
FABR-060D-L2								115	182			
FABR-060D-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	86	153	5.5	77.5	107.5
FABR-060D-L2								115	182			
FABR-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	86	163	12	87	117
FABR-060M1-L2								115	192			

* 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

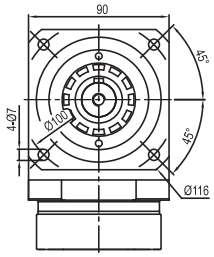
外形尺寸图表 / OUTLINE DIMENSION SHEET

FABR-090D(M1)-L1

输入端/INPUT

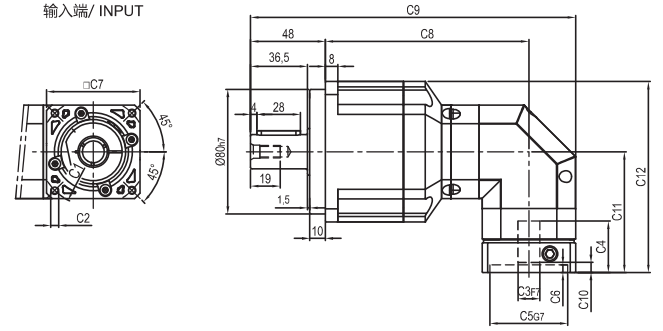


输出端/ OUTPUT

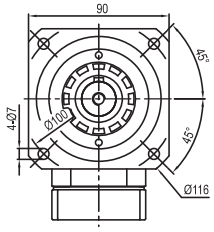


FABR-090D(M1)-L2

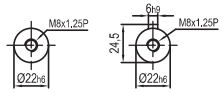
输入端/ INPUT



输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	116	209	7	96	141
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	116	209	6	96	141
FABR-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	116	214	16.5	117.5	162.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	116	229	19	120	165
FABR-090D-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	130.5	208.5	5.5	77.5	122.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	130.5	208.5	5.5	77.5	122.5
FABR-090M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	130.5	218.5	12	87	132
	Ø100	4-M6x14	Ø16	42.5	Ø80	6.5	86	130.5	221.5	11	87	132

* 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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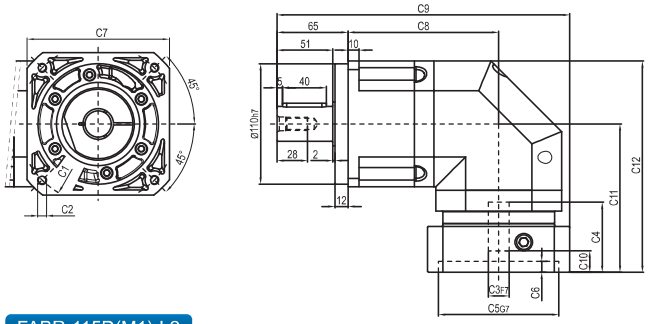
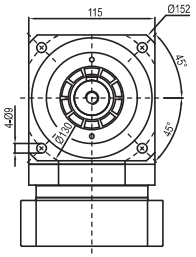
外形尺寸图表 / OUTLINE DIMENSION SHEET

FABR-115D(M1)-L1

输入端/ INPUT

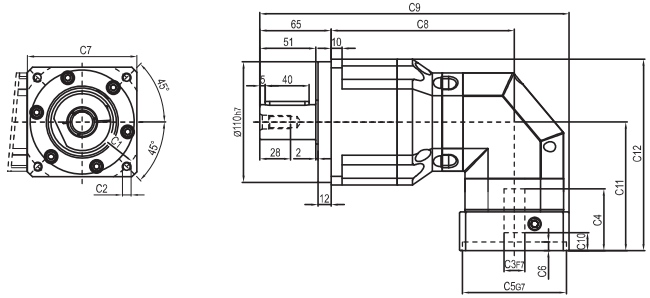


输出端/OUTPUT

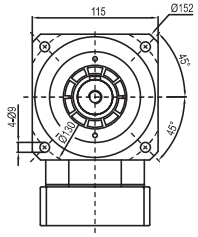


FABR-115D(M1)-L2

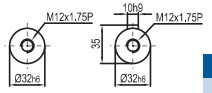
输入端/ INPUT



输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

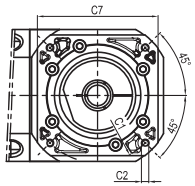
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-115D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	137.5	267.5	19.5	135.5	193
FABR-115M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	137.5	292.5	28	152.5	210
FABR-115D-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	167.5	277.5	7	96	153.5
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	167.5	277.5	6	96	153.5
FABR-115M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	167.5	282.5	16.5	117.5	175
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	167.5	297.5	19	120	177.5

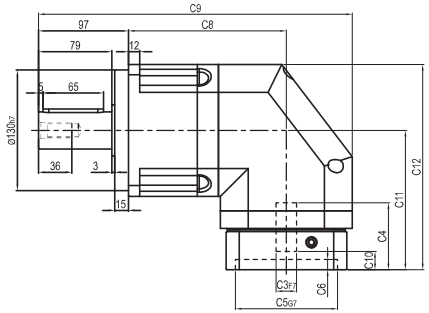
* C1~C7是公制标准马达连接板之尺寸.可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

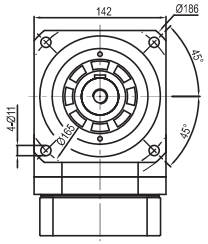
FABR-142D(M1)-L1

输入端/INPUT



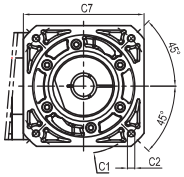


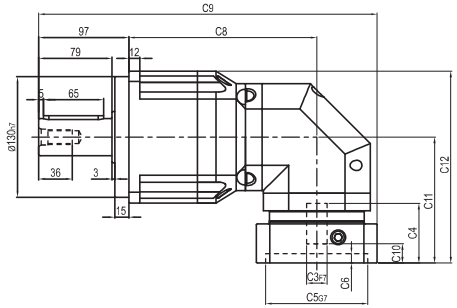
输出端/ OUTPUT



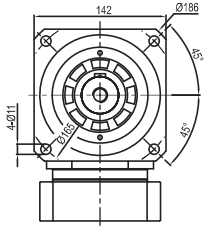
FABR-142D(M1)-L2

输入端/ INPUT

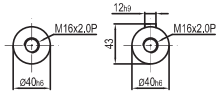




输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-142D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	170	338	19.5	150	221
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	170	357	25	160	231
FABR-142D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	202.5	364.5	19.5	135.5	206.5
FABR-142M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	202.5	389.5	28	152.5	223.5

* 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。
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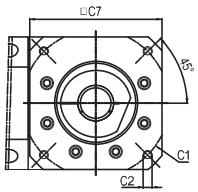
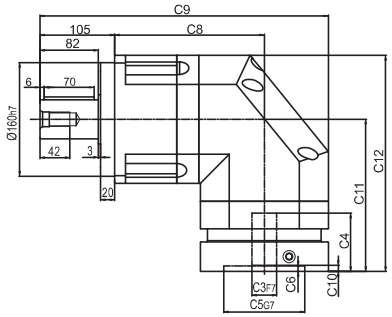
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

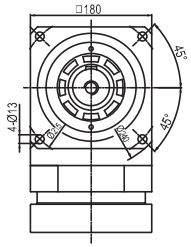
FABR-180D-L1

输入端/ INPUT



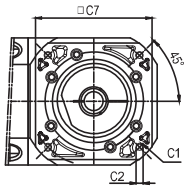


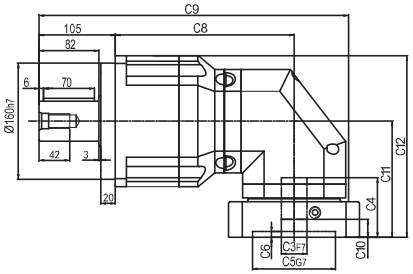
输出端/OUTPUT



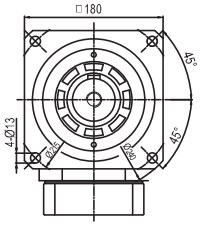
FABR-180D-L2

输入端/ INPUT

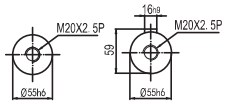




输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

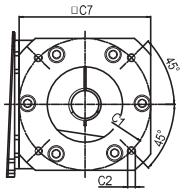
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-180D-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	210.5	405.5	8.5	214	304
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	210.5	405.5	45.5	249.5	339.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	210.5	411.5	13.5	219	309
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	213.5	318.5	45.5	249.5	339.5
FABR-180D-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	246	422	19.5	150	240
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	246	441	25	160	250

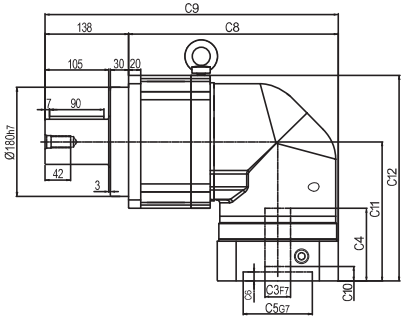
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

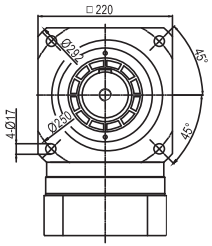
FABR-220D-L1

输入端/INPUT



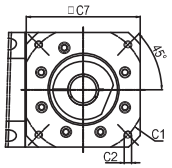


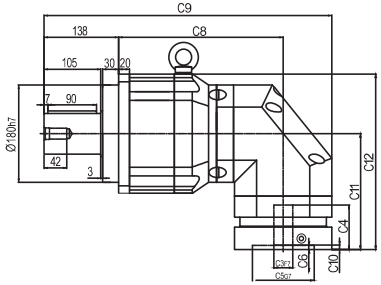
输出端/ OUTPUT



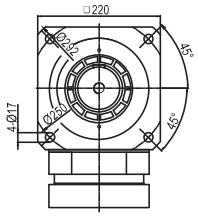
FABR-220D-L2

输入端/ INPUT



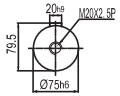


输出端 /OUTPUT



输出轴径/Output Diameter

轴型式 S1



轴型式 S2

尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-220D-L1	Ø200	4-M12x28	Ø35,Ø42	120	Ø114.3	15	200	346.5	484.5	24	230	340
	Ø215	4-M12x30	Ø38	110	Ø180	8	200	346.5	484.5	11.5	220	330
	Ø235	4-M12x30	Ø42,Ø55	120	Ø200	10	220	346.5	494.5	24	230	340
FABR-220D-L2	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	304	532	8.5	214	324
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	304	532	45.5	249.5	359.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	304	538	13.5	219	329
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	304	552	45.5	249.5	359.5

* 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

FAD
SERIES

型号说明 / MODEL ILLUMINATE

FAD 090 – 10 – P2 / 马达

减速机型式：
FAD047/FAD064/FAD090
FAD110/FAD140/FAD200/FAD255

背隙：P0：超精密背隙
P1：精密背隙
P2：标准背隙

减速比：单级(L1)：4,5,6,7,8,10
双级(L2)：20,25,35,40,50,60,70,80,100

马达型号：
马达制造及型号

选用范例：FAD090-10-P2/MHMD-082G1U

FLIKS 传动装置专业制造商
PROFESSIONAL MANUFACTURER OF TRANSMISSION DEVICE
FAD系列

减速机性能资料 / GEAR BOX PERFORMANCE INFORMATION

规 格		级 数	减速比[1]	FAD047	FAD064	FAD090	FAD110	FAD140	FAD200	FAD255
额定输出力矩T_{2N}	Nm	1	4	19	48	130	270	560	1,100	1,700
			5	22	60	160	330	650	1,200	2,000
			6	-	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	20	19	48	130	270	560	1,100	1,700
			25	22	60	160	330	650	1,200	2,000
			35	22	60	160	330	650	1,200	2,000
			40	22	48	130	270	560	1,100	1,700
			50	22	60	160	330	650	1,200	2,000
			60	-	55	150	310	600	1,100	1,900
			70	19	50	140	300	550	1,100	1,800
			80	-	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	4~100	3倍额定输出力矩						
额定输入转速n_1	rpm	1,2	4~100	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	4~100	10,000	10,000	8,000	8,000	6,000	6,000	4,000
超精密背隙 P0	arcmin	1	4~100	-	-	≤1	≤1	≤1	≤1	≤1
		2	4~10	-	-	-	≤3	≤3	≤3	≤3
精密背隙 P1	arcmin	1	20~100	≤3	≤3	≤3	≤3	≤3	≤3	≤3
		2	4~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5
标准背隙 P2	arcmin	1	20~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	4~10	≤7	≤7	≤7	≤7	≤7	≤7	≤7
扭转刚性	Nm/arcmin	1,2	20~100	7	13	31	82	151	440	1,006
最大弯曲力矩M_{2KB}[2]	Nm	1,2	4~100	42.5	125	235	430	1,300	3,064	5,900
容许径向力F_{2B}[2]	N	1,2	4~100	1,080	2,110	2,310	4,800	6,200	5,450	10,600
使用寿命	hr	1,2	4~100	20,000＊						
效率 η	%	1	4~10	≥97%						
		2	20~100	≥94%						
重量	kg	1	4~10	0.7	1.2	3.0	5.6	11.9	31.6	56.1
		2	20~100	1.0	1.6	3.7	7.3	15.9	36.9	70.4
使用温度	℃	1,2	4~100	-10℃~+90℃						
润滑		1,2	4~100	合成润滑油脂						
防护等级		1,2	4~100	IP65						
安装方向		1,2	4~100	任意方向						
噪音值（n_1=3000rpm）	dB	1,2	4~100	≤56	≤58	≤60	≤63	≤65	≤67	≤70

减速机转动惯量

规 格		级 数	减速比[1]	FAD047	FAD064	FAD090	FAD110	FAD140	FAD200	FAD255
转动惯量J_1	kg·cm²	1	4	0.03	0.14	0.51	2.87	7.54	25.03	58.31
			5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
			6	-	0.13	0.45	2.65	7.25	-	-
			7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
			8	0.03	0.13	0.45	2.58	7.07	22.48	50.97
			10	0.03	0.13	0.44	2.57	7.03	22.51	50.56
		2	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
			35	0.03	0.13	0.13	0.47	2.71	7.42	23.29
			40	0.03	0.13	0.13	0.44	2.57	7.03	22.51
			50	0.03	0.13	0.13	0.44	2.57	7.03	22.51
			60	-	0.13	0.13	0.44	2.57	-	-
			70	0.03	0.13	0.13	0.44	2.57	7.03	22.51
			80	-	0.13	0.13	0.44	2.57	-	-
			100	0.03	0.13	0.13	0.44	2.57	7.03	22.51

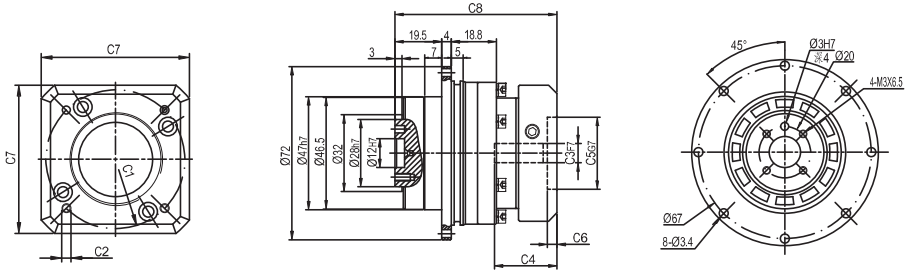
1.减速比（$i=N_{in}/N_{out}$）
* 连续运转降低使用寿命二分之一。

2.输出转数 **100rpm** 时，作用于输出轴中心位置。

外形尺寸图表 / OUTLINE DIMENSION SHEET

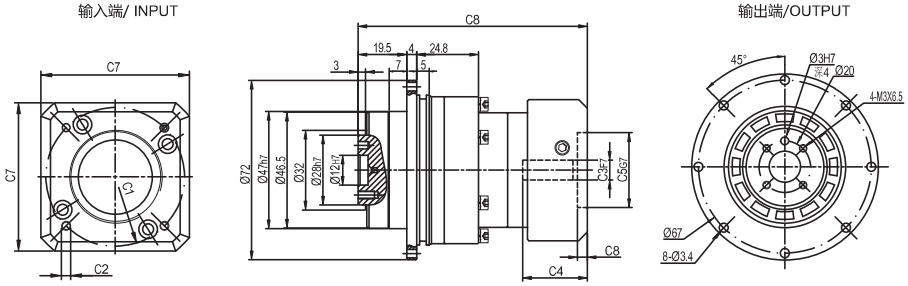
FAD-047D-L1

输入端/ INPUT　　输出端/OUTPUT



FAD-047D-L2

输入端/ INPUT　　输出端/OUTPUT



尺寸	C1	C2	C3	C4	C5	C6	C7	C8
FAD-047D-L1	Ø46	4-M4x10	Ø8	26	Ø30	4	42	67.5
	Ø45	4-M3x8						
FAD-047D-L2	Ø46	4-M4x10	Ø8	26	Ø30	4	42	92
	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。
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* D: Conventional Hole, M1: Limit Hole

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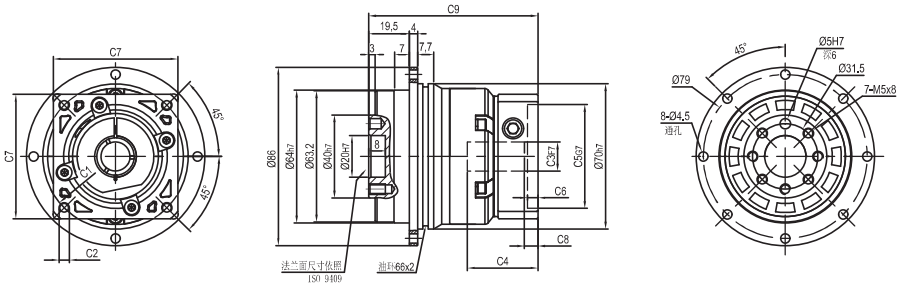
FAD系列

外形尺寸图表 / OUTLINE DIMENSION SHEET

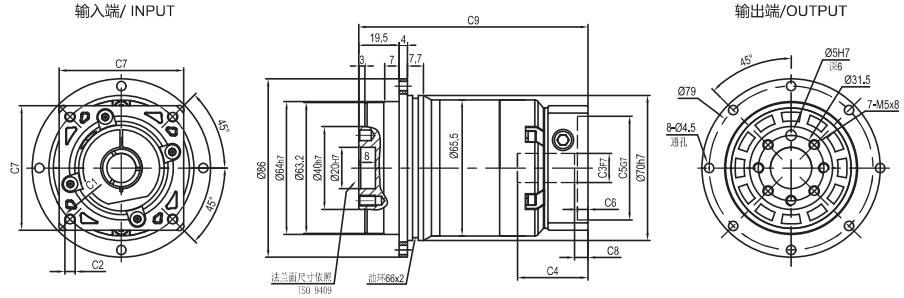
FAD-064D(M1)-L1

输入端/ INPUT　　输出端/OUTPUT



FAD-064D(M1)-L2

输入端/ INPUT　　输出端/OUTPUT



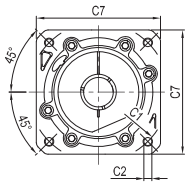
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-064D-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	5.5	81.5
FAD-064D-L2									110.5
FAD-064D-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	5.5	81.5
FAD-064D-L2									110.5
FAD-064M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	12	88
FAD-064M1-L2									117

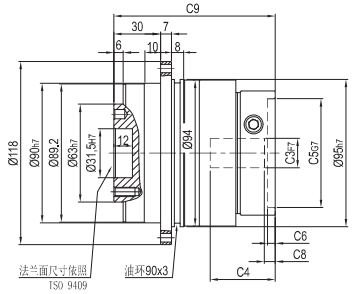
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

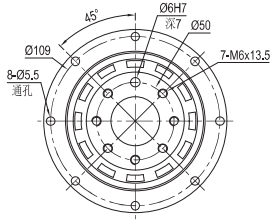
FAD-090D(M1)-L1

输入端/INPUT



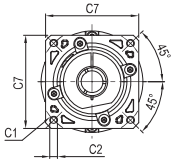


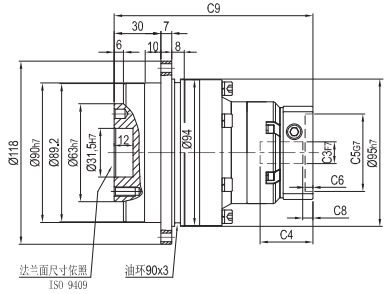
输出端/ OUTPUT



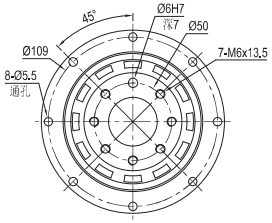
FAD-090D(M1)-L2

输入端/ INPUT





输出端 /OUTPUT



尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-090D-L1	Ø90	4-M5x12 , 4-M6x14	Ø19	42	Ø70	6.5	80	7	104
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	6	104
FAD-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	16.5	119.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	19	122
FAD-090D-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	5.5	128
	Ø70	4-M4x10 , 4-M5x12	Ø11,Ø14	34	Ø50	5	60	5.5	128
FAD-090M1-L2	Ø90	4-M5x12 , 4-M6x14	Ø19	42	Ø70	6.5	80	12	134.5
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	11	134.5

* 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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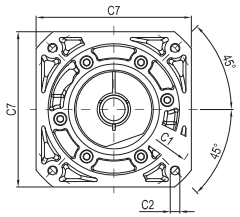
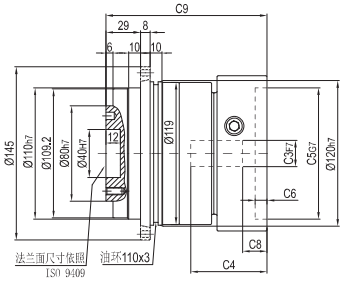
FAD系列

外形尺寸图表 / OUTLINE DIMENSION SHEET

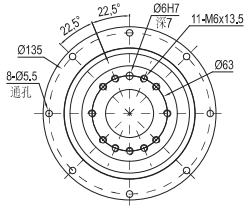
FAD-110D(M1)-L1

输入端/ INPUT



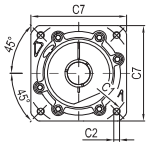


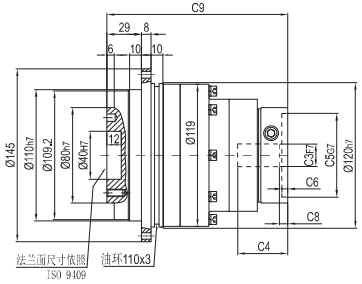
输出端/OUTPUT



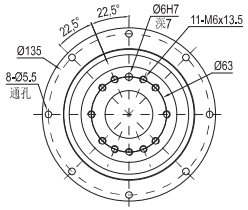
FAD-110D(M1)-L2

输入端/ INPUT





输出端/OUTPUT



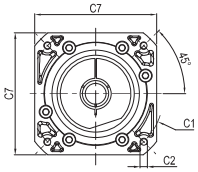
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-110D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	19.5	135
FAD-110M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	28	152.5
FAD-110D-L2	Ø90	4-M5x12 , 4-M6x14	Ø19	42	Ø70	6.5	80	7	151.5
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	6	151.5
FAD-110M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	16.5	167
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	19	169.5

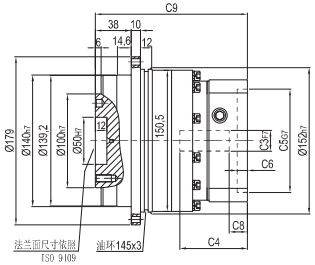
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

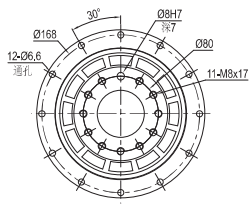
FAD-140D(M1)-L1

输入端/INPUT



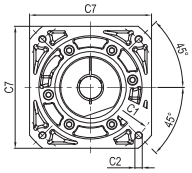


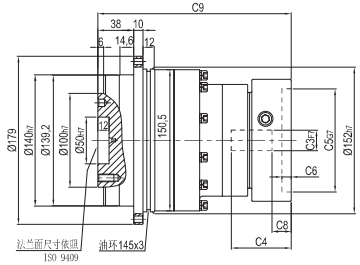
输出端/ OUTPUT



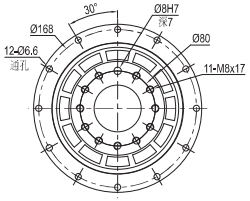
FAD-140D(M1)-L2

输入端/ INPUT





输出端 /OUTPUT



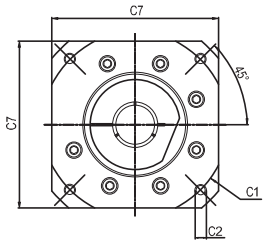
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-140D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	19.5	162
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	25	172
FAD-140D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	19.5	206
FAD-140M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	28	223.5

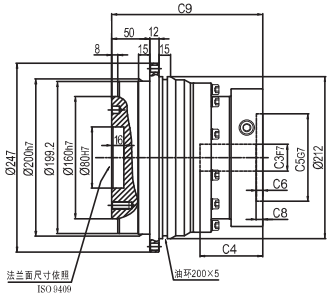
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

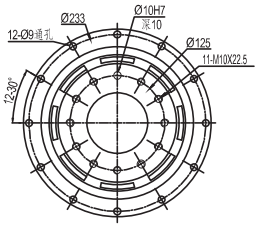
FAD-200D-L1

输入端/ INPUT



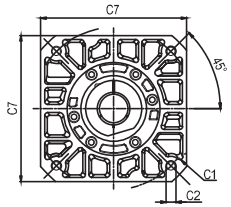


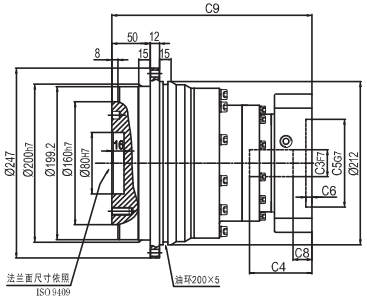
输出端/OUTPUT



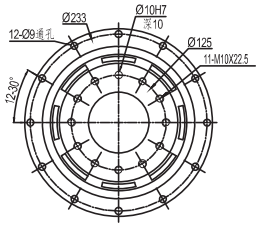
FAD-200D-L2

输入端/ INPUT





输出端/OUTPUT

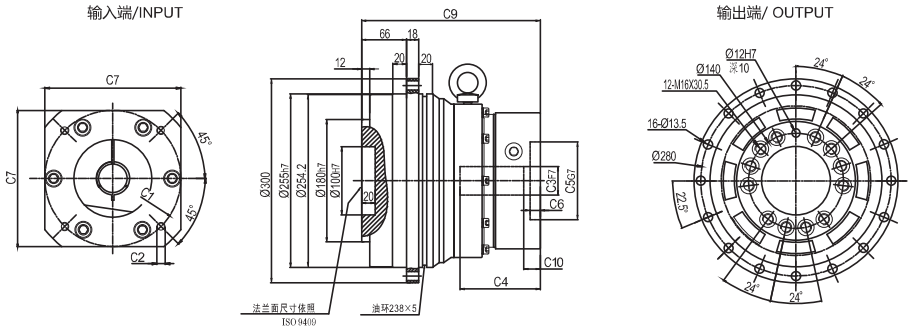


尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-200D-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	8.5	197.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	45.5	233
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	13.5	202.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	45.5	233
FAD-200D-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	19.5	250.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	25	260.5

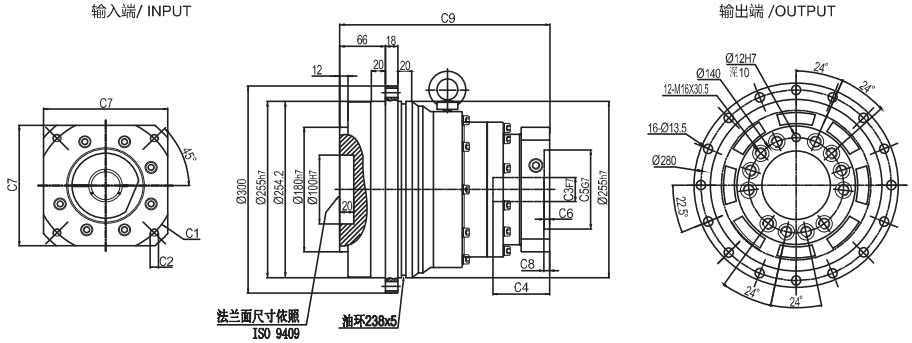
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

FAD-255D-L1



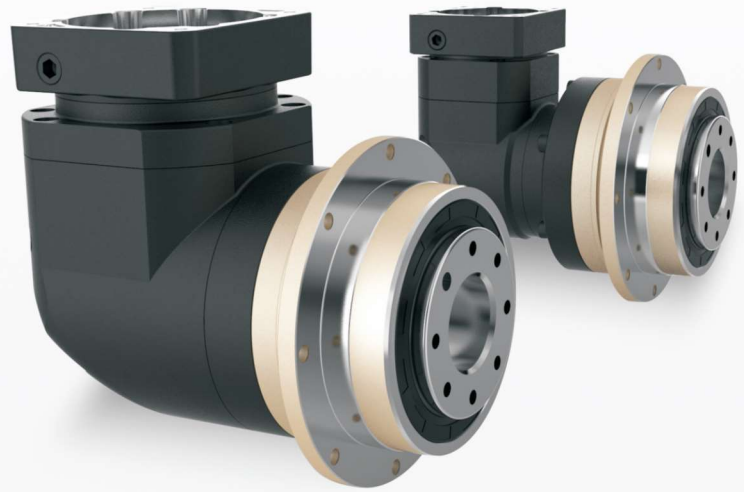
FAD-255D-L2



尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-255D-L1	Ø200	4-M12x28	Ø35,Ø42	118	Ø114.3	15	200	24	262.5
	Ø215	4-M12x30	Ø38	108	Ø180	8	200	11.5	252.5
	Ø235	4-M12x30	Ø42,Ø55	118	Ø200	10	220	24	262.5
FAD-255D-L2	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	8.5	304
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	45.5	339.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	13.5	309
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	45.5	339.5

* 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

FADR
SERIES



型号说明 / MODEL ILLUMINATE

FADR 090 – 10 – P2 / 马达

减速机型式：
FADR047/FADR064/FADR090
FADR110/FADR140/FADR200/FADR255

背隙：P0：超精密背隙
P1：精密背隙
P2：标准背隙

减速比：单级(L1)： 4,5,6,7,8,10,14,20
双级(L2)： 20,25,35,40,50,60,70,80,
100,120,140,160,200

马达型号：
马达制造及型号

选用范例：FADR090-10-P2/MHMD-082G1U

FLIKS 传动装置专业制造商
PROFESSIONAL MANUFACTURER OF TRANSMISSION DEVICE
FADR系列

减速机性能资料/ GEAR BOX PERFORMANCE INFORMATION

规 格		级 数	减速比[1]	FADR047	FADR064	FADR090	FADR110	FADR140	FADR200	FADR255
额定输出力矩T_{2N}	Nm	1	4	19	48	130	270	560	1,100	1,700
			5	22	60	160	330	650	1,200	2,000
			6	-	55	150	310	600	1,100	1,900
			7	19	50	140	300	550	1,100	1,800
			8	17	48	130	270	560	1,100	1,700
			10	14	60	160	330	650	1,200	2,000
			14	-	50	140	300	550	1,100	1,800
			20	-	40	100	230	450	900	1,500
		2	20	19	48	130	270	560	1,100	1,700
			25	22	60	160	330	650	1,200	2,000
			35	22	60	160	330	650	1,200	2,000
			40	22	48	130	270	560	1,100	1,700
			50	22	60	160	330	650	1,200	2,000
			60	-	55	150	310	600	1,100	1,900
			70	22	60	160	330	650	1,200	2,000
			80	-	48	130	270	560	1,100	1,700
			100	22	60	160	330	650	1,200	2,000
			120	-	-	150	310	600	1,100	1,900
			140	-	-	140	300	550	1,100	1,800
			160	-	-	120	260	500	1,000	1,600
			200	-	-	100	230	450	900	1,500
最大输出力矩T_{2B}	Nm	1,2	4~200	3倍额定输出力矩						
额定输入转速n_1	rpm	1,2	4~200	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	4~200	10,000	10,000	8,000	8,000	6,000	6,000	4,000
超精密背隙 P0	arcmin	1	4~20	-	-	≤2	≤2	≤2	≤2	≤2
		2	20~200	-	-	≤4	≤4	≤4	≤4	≤4
精密背隙 P1	arcmin	1	4~20	≤4	≤4	≤4	≤4	≤4	≤4	≤4
		2	20~200	≤7	≤7	≤7	≤7	≤7	≤7	≤7
标准背隙 P2	arcmin	1	4~20	≤6	≤6	≤6	≤6	≤6	≤6	≤6
		2	20~200	≤9	≤9	≤9	≤9	≤9	≤9	≤9
扭转刚性		1,2	4~200	7	13	31	82	151	440	1,006
最大弯曲力矩M_{2KB}[2]	Nm	1,2	4~200	42.5	125	235	430	1,300	3,064	5,900
容许径向力F_{2B}[2]	N	1,2	4~200	1,080	2,110	2,310	4,800	6,200	5,450	10,600
使用寿命	hr	1,2	4~200	20,000＊						
效率 η	%	1	4~20	≥95%						
		2	20~200	≥92%						
重量	kg	1	4~20	1.1	2.1	5.9	10.5	21.9	50.9	85.4
		2	20~200	1.4	1.9	4.5	9.8	20.1	45.4	85.9
使用温度	℃	1,2	4~200	-10℃~+90℃						
润滑		1,2	4~200	合成润滑油脂						
防护等级		1,2	4~200	IP65						
安装方向		1,2	4~200	任意方向						
噪音值（n_1=3000rpm）	dB	1,2	4~200	≤61	≤63	≤65	≤68	≤70	≤72	≤74

减速机转动惯量

规 格		级 数	减速比[1]	FADR047	FADR064	FADR090	FADR110	FADR140	FADR200	FADR255
转动惯量J_1	kg·cm²	1	4~7	0.09	0.35	2.25	6.84	23.4	68.9	135.4
			8~10	0.09	0.07	1.87	6.25	21.8	65.6	119.8
			14~20	–	0.07	1.87	6.25	21.8	65.6	119.8
		2	20~40	0.09	0.35	0.35	2.25	6.84	23.4	68.9
			50	–	0.07	0.31	1.87	6.25	21. 8	65.6
			60	–	0.07	0.35	2.25	6.84	–	–
			70~100	–	0.07	0.31	1.87	6.25	21. 8	65.6
			120~200	–	0.07	0.31	1.87	6.25	21. 8	65.6

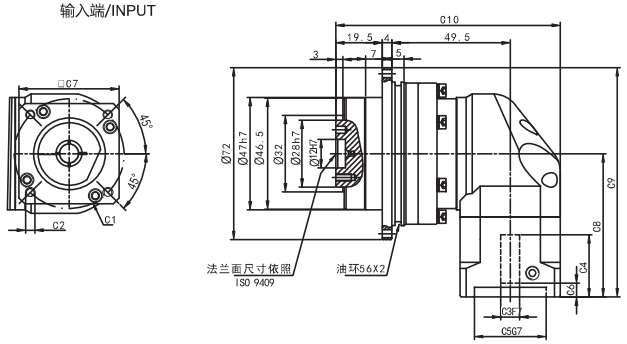
1.减速比（$i=N_{in}/N_{out}$）
＊ 连续运转降低使用寿命二分之一。

2.输出转数 100rpm 时，作用于输出轴中心位置。

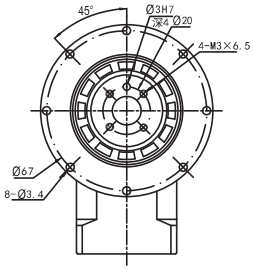
外形尺寸图表 / OUTLINE DIMENSION SHEET

FADR-047D-L1

输入端/INPUT

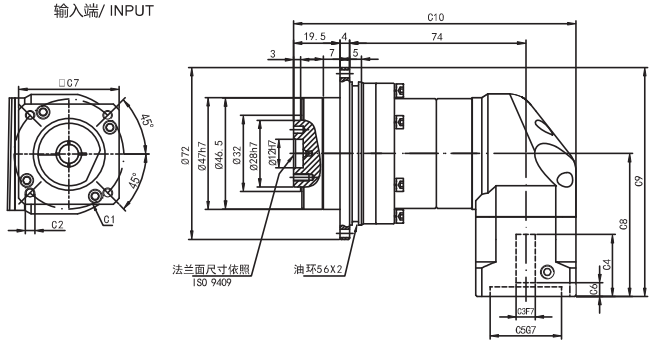


输出端/ OUTPUT

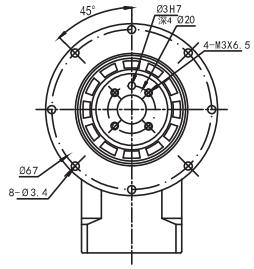


FADR-047D-L2

输入端/ INPUT



输出端 /OUTPUT



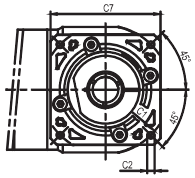
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FADR-047D-L1	Ø46	4-M4x10	Ø8	26	Ø30	4	42	60	96	94
	Ø45	4-M3x8								
FADR-047D-L2	Ø46	4-M4x10	Ø8	26	Ø30	4	42	60	96	118.5
	Ø45	4-M3x8								

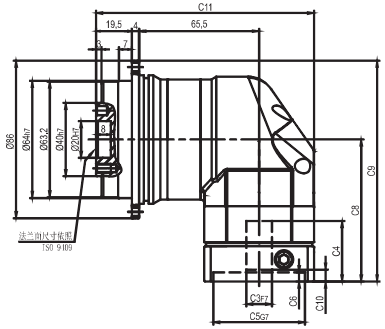
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised.
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

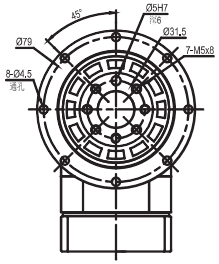
FADR-064D(M1)-L1

输入端/ INPUT



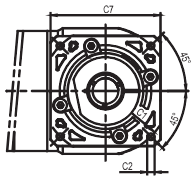


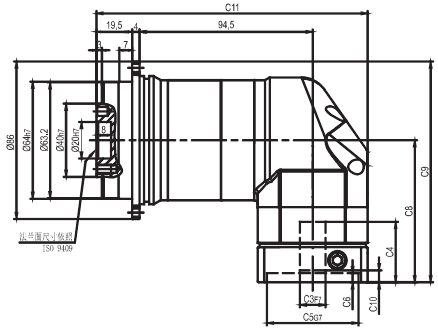
输出端/OUTPUT



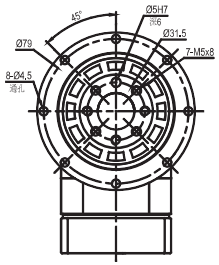
FADR-064D(M1)-L2

输入端/ INPUT





输出端/OUTPUT



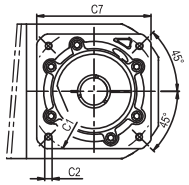
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FADR-064D-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	77.5	120.5	5.5	119
FADR-064D-L2											148
FADR-064D-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	77.5	120.5	5.5	119
FADR-064D-L2											148
FADR-064M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	87	130	12	129
FADR-064M1-L2											158

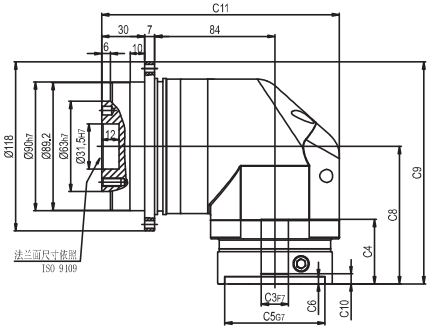
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

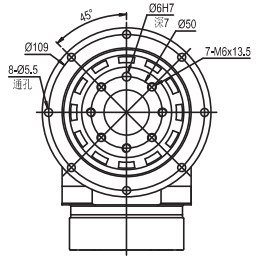
FADR-090D(M1)-L1

输入端/INPUT



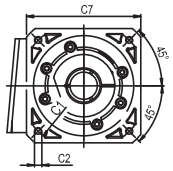


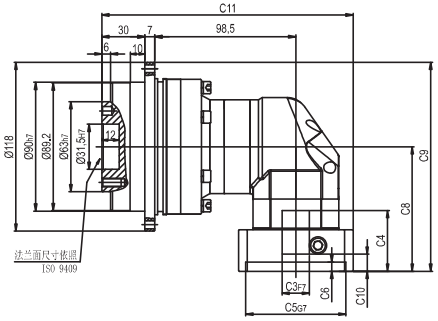
输出端/ OUTPUT



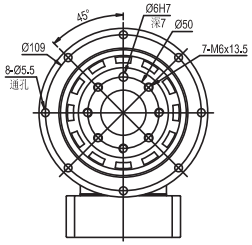
FADR-090D(M1)-L2

输入端/ INPUT





输出端 /OUTPUT



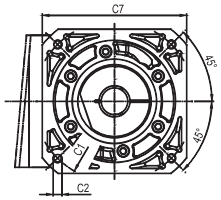
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FADR-090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	96	155	7	166
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	96	155	6	166
FADR-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	117.5	176.5	16.5	171
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	120	179	19	186
FADR-090D-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	77.5	136.5	5.5	165.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	77.5	136.5	5.5	165.5
FADR-090M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	87	146	12	175.5
	Ø100	4-M6x14	Ø16	42.5	Ø80	6.5	86	87	146	11	175.5

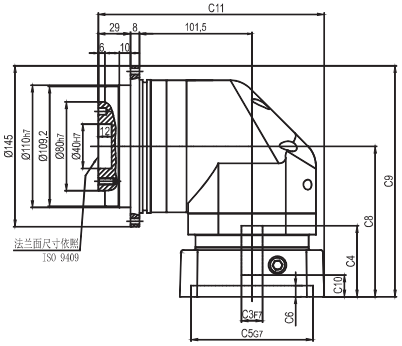
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

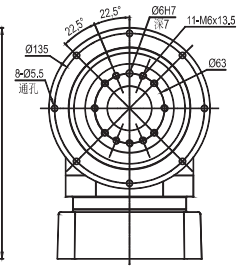
FADR-110D(M1)-L1

输入端/ INPUT



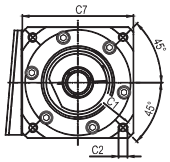


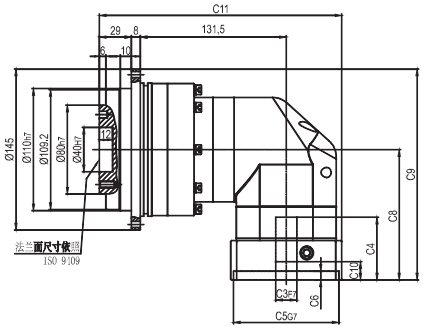
输出端/OUTPUT



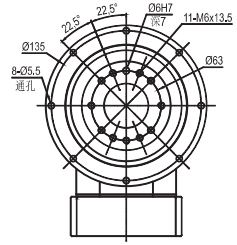
FADR-110D(M1)-L2

输入端/ INPUT





输出端/OUTPUT



尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FADR-110D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	135.5	208	19.5	203.5
FADR-110M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	152.5	225	28	228.5
FADR-110D-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	96	168.5	7	213.5
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	96	168.5	6	213.5
FADR-110M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	117.5	190	16.5	218.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	120	192.5	19	233.5

* 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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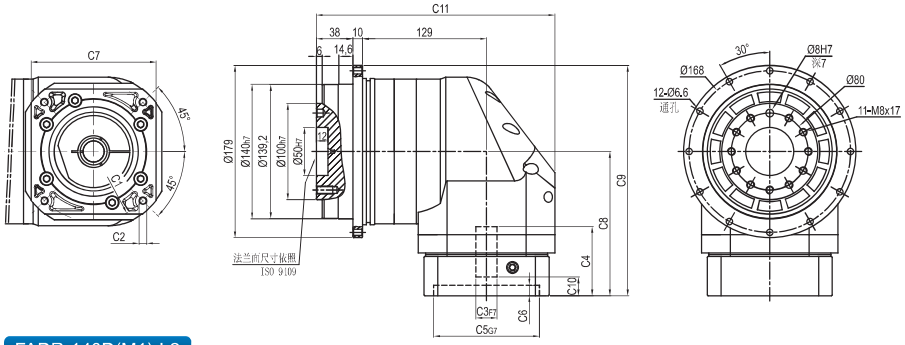
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

FADR-140D(M1)-L1

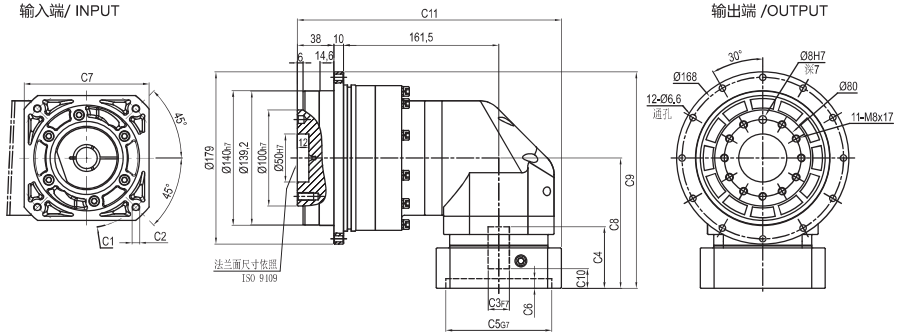
输入端/INPUT



输出端/ OUTPUT

FADR-140D(M1)-L2

输入端/ INPUT



输出端 /OUTPUT

尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FADR-140D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	150	239.5	19.5	248
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	160	249.5	25	267
FADR-140D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	135.5	225	19.5	274.5
FADR-140M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	152.5	242	28	299.5

* 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:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

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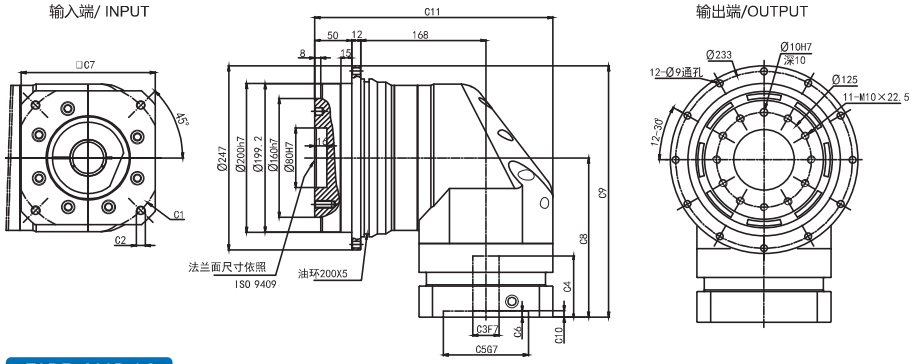
FADR系列

外形尺寸图表 / OUTLINE DIMENSION SHEET

FADR-200D-L1

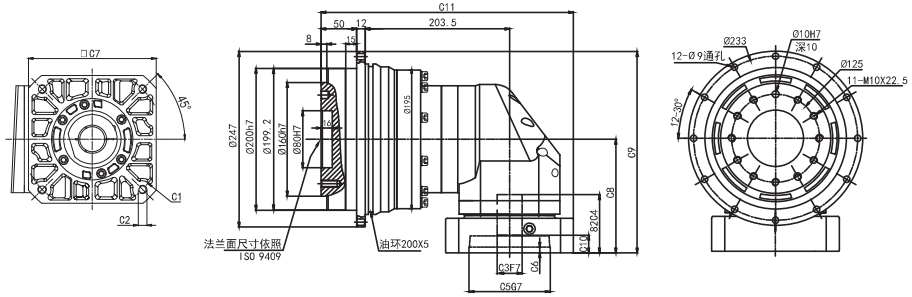
输入端/ INPUT



输出端/OUTPUT

FADR-200D-L2

输入端/ INPUT



输出端/OUTPUT

尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FADR-200D-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	214	337.5	8.5	320
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	249.5	373	45.5	320
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	219	342.5	13.5	326
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	249.5	373	45.5	320
FADR-200D-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	150	247.5	19.5	336.5
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	160	283.5	25	355.5

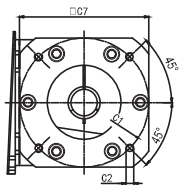
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

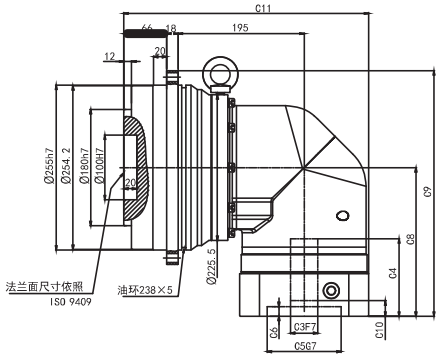
FB/FE SERIES

外形尺寸图表 / OUTLINE DIMENSION SHEET

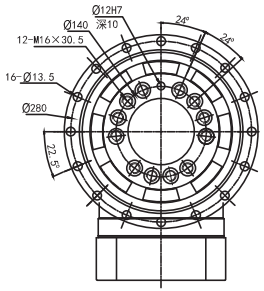
FADR-255D-L1

输入端/INPUT



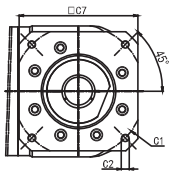


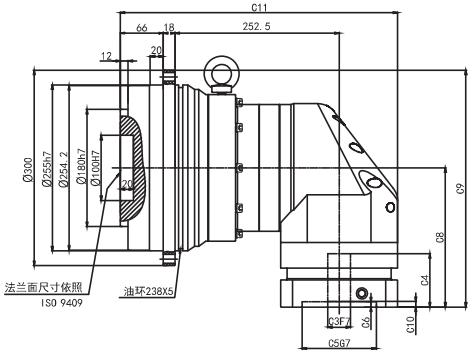
输出端/ OUTPUT



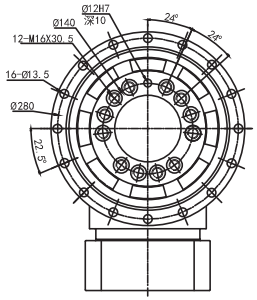
FADR-255D-L2

输入端/ INPUT



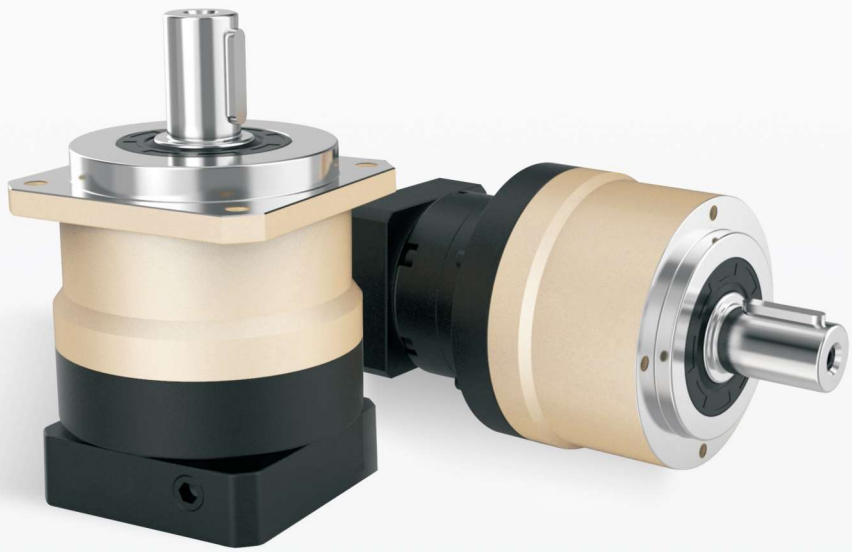


输出端 /OUTPUT



尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FADR-255D-L1	Ø200	4-M12x28	Ø35,Ø42	120	Ø114.3	15	200	230	380	24	379
	Ø215	4-M12x30	Ø38	110	Ø180	8	200	220	370	11.5	379
	Ø235	4-M12x30	Ø42,Ø55	120	Ø200	10	220	230	380	24	389
FADR-255D-L2	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	214	364	8.5	426.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	249.5	399.5	45.5	426.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	219	369	13.5	432.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	249.5	399.5	45.5	446.5

* 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



型号说明 / MODEL ILLUMINATE

FB090 – 10 – S2 – 马达

减速机型式：
FB042/FB060/FB090/FB115/FB142
FB180/FB220
FE070/FE090/FE120/FE155/FE205
FE235

输出轴型式选择：S1：平滑直轴
S2：附件直轴

马达型号：
马达制造及型号

减速比：单级(L1)： 3,4,5,6,7,8,10
双级(L2)： 12,15,20,25,30,35,40,50,60,70,80,100

选用范例：FB090-10-S2/MHMD-082G1U

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PROFESSIONAL MANUFACTURER OF TRANSMISSION DEVICE
FB/FE系列

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_{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

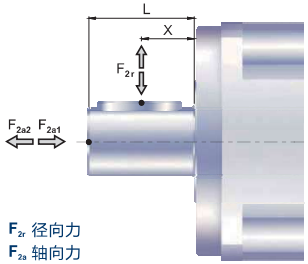
规 格		级 数	减速比[1]	FB042	FB060 FE070	FB090 FE090	FB115 FE120	FB142 FE155	FB180 FE205	FB220 FE235
转动惯量J_1	kg·cm²	1	3	0.03	0.16	0.61	3.25	9.21	28.98	69.61
			4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
			5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
			6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
			7	0.03	0.13	0.45	2.62	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

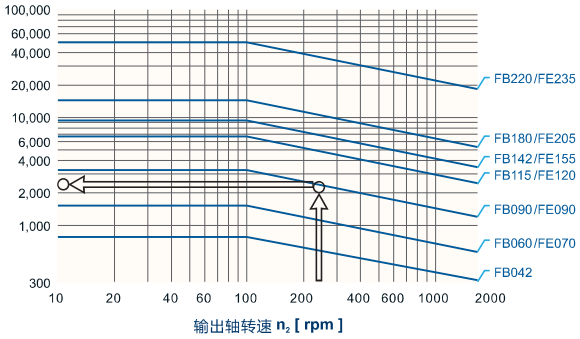
REDUCER OUTPUT SHAFT OF THE PERMISSIBLE RADIAL FORCE AND SHAFT AND FORCE



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.

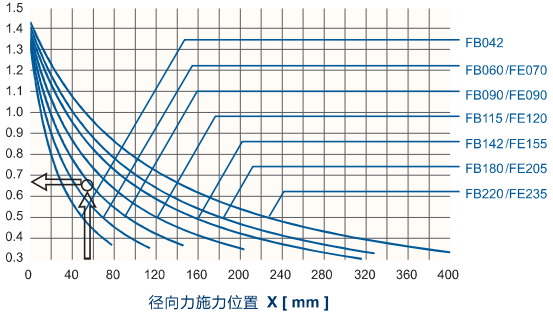
容许径向力F_{2rB} [N] 施力于轴中心位置



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：

$F'_{2rB}=KbxF_{2rB}$

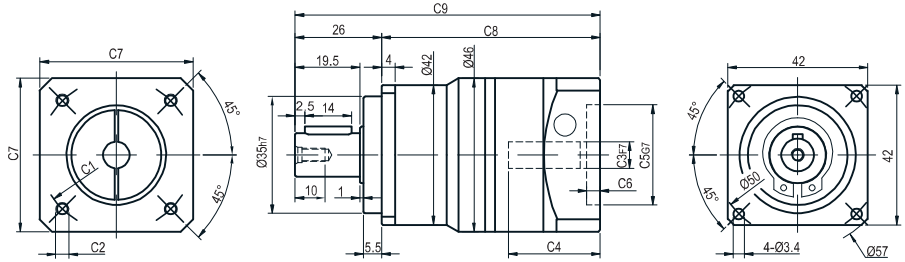
轴向力:

$F'_{2a1B}=0.2xF'_{2rB}$
$F'_{2a2B}=0.1xF'_{2rB}$

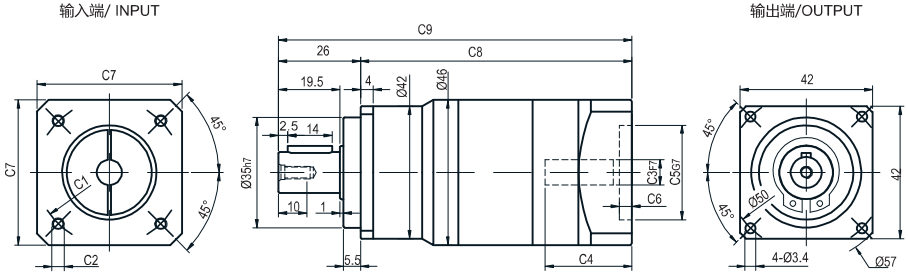
＊ 连续运转降低使用寿命二分之一。

外形尺寸图表 / OUTLINE DIMENSION SHEET

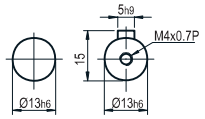
FB-042-L1



FB-042-L2



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

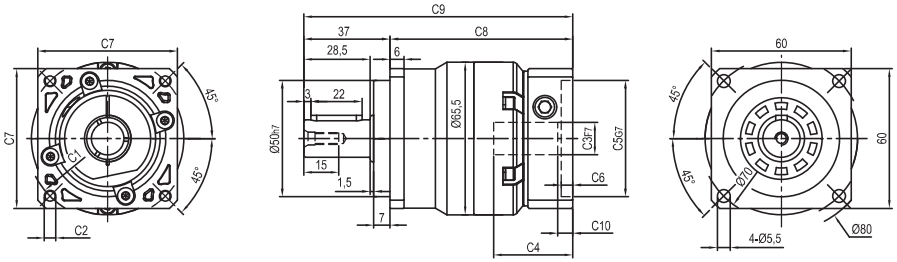
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9
FB-042-L1	Ø45	4-M3x8	Ø8	27.5	Ø30	5	46	65.5	91.5
	Ø46	4-M4x10	Ø8	27.5	Ø30	5	46	65.5	91.5
	Ø66.67	4-M4x10	Ø6.35,Ø8	27.5	Ø38.1	5	57	65.5	91.5
	Ø70	4-M4x10,4-M5x12	Ø11	32	Ø50	5	60	70	96
FB-042-L2	Ø45	4-M3x8	Ø8	27.5	Ø30	5	46	86	112
	Ø46	4-M4x10	Ø8	27.5	Ø30	5	46	86	112
	Ø66.67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

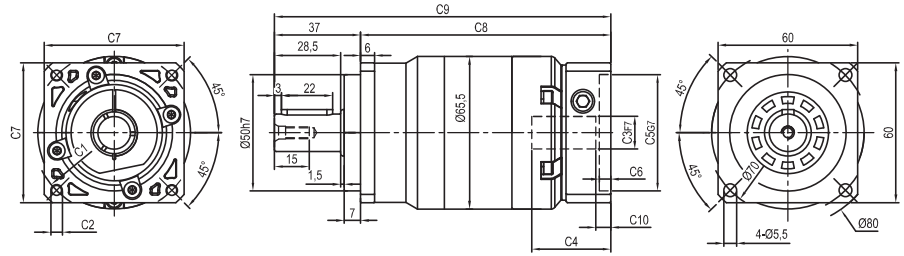
FB-060D(M1)-L1

输入端/INPUT　　输出端/ OUTPUT

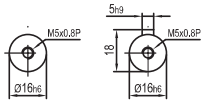


FB-060D(M1)-L2

输入端/ INPUT　　输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

尺寸	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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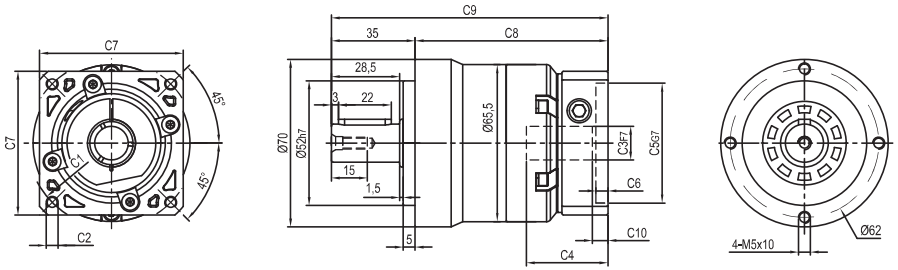
外形尺寸图表 / OUTLINE DIMENSION SHEET

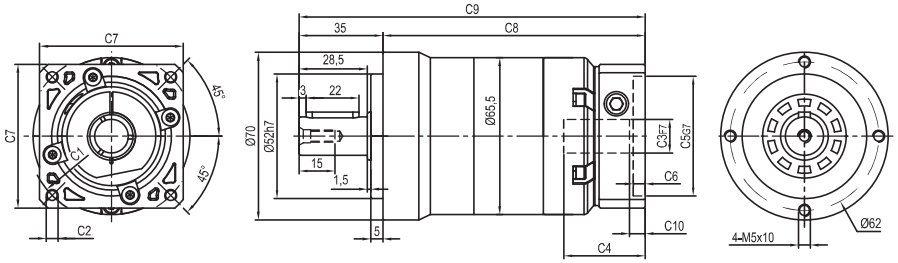
FE-070D(M1)-L1

输入端 / INPUT　　输出端 / OUTPUT

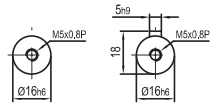


FE-070D(M1)-L2

输入端 / INPUT　　输出端 / OUTPUT



输出轴径/Output Diameter



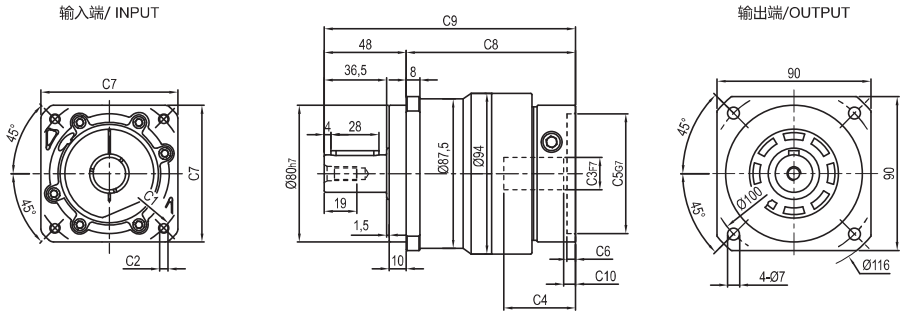
轴型式 S1　　轴型式 S2

尺寸	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

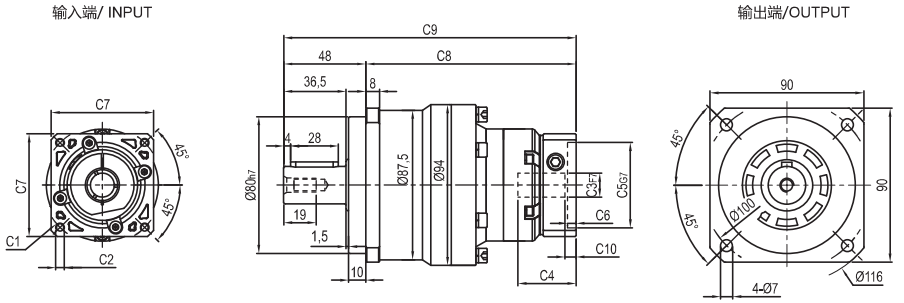
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

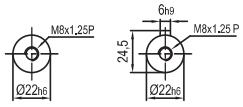
FB-090D(M1)-L1



FB-090D(M1)-L2



输出轴径/Output Diameter



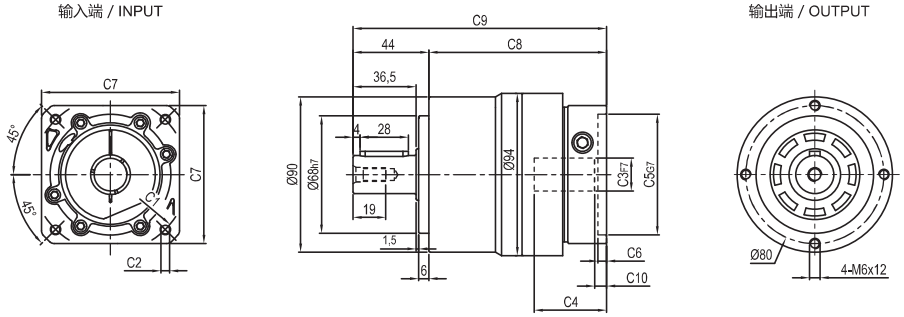
轴型式 S1　　轴型式 S2

尺寸	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

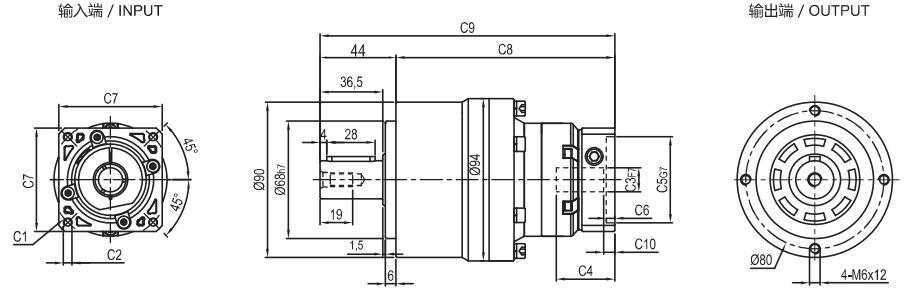
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

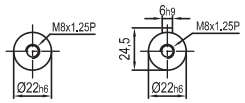
FE-090D(M1)-L1



FE-090D(M1)-L2



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

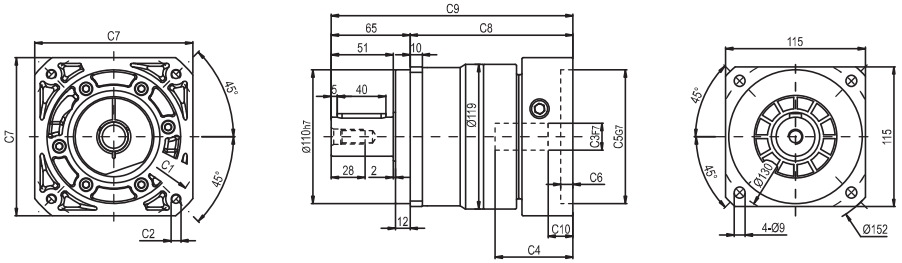
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	103	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	103	147	6
FE-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	118.5	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	121	165	19
FE-090D-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	127	171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

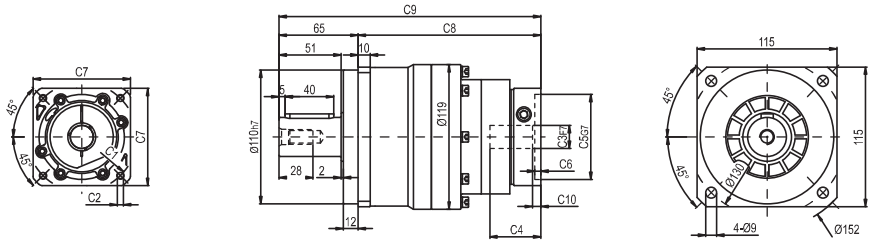
FB-115D(M1)-L1

输入端/INPUT　　输出端/ OUTPUT

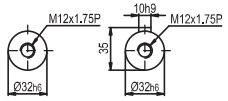


FB-115D(M1)-L2

输入端/ INPUT　　输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1　轴型式 S2

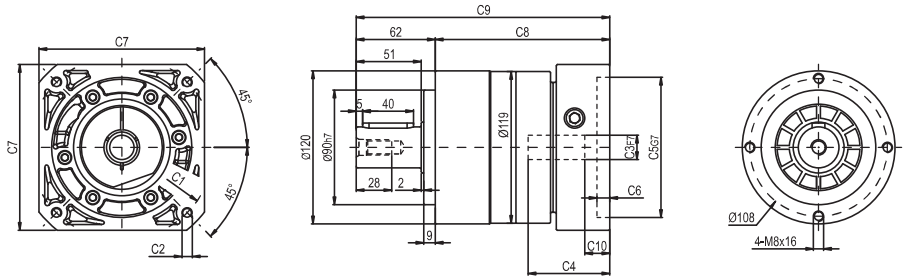
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-115D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	134	199	19.5
FB-115M1-L1	Ø200	4-M12x28	Ø35	81	Ø114. 3	10	180	151.5	216.5	28
FB-115D-L2	Ø90	4-M5x12 , 4-M6x14	Ø19	42	Ø70	6.5	80	150.5	215.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	150.5	215.5	6
FB-115M1-L2	Ø115	4-M8x20	Ø19,Ø22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

外形尺寸图表 / OUTLINE DIMENSION SHEET

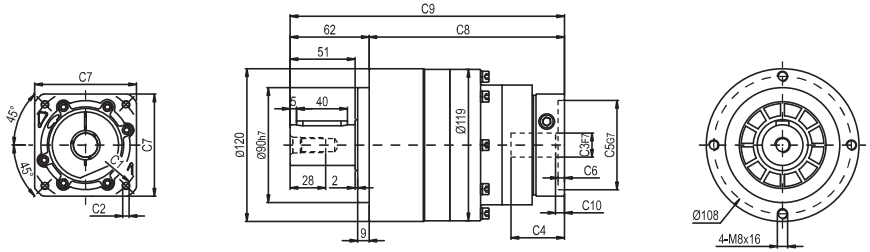
FE-120D(M1)-L1

输入端 / INPUT　　输出端 / OUTPUT

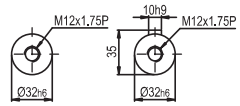


FE-120D(M1)-L2

输入端 / INPUT　　输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1　轴型式 S2

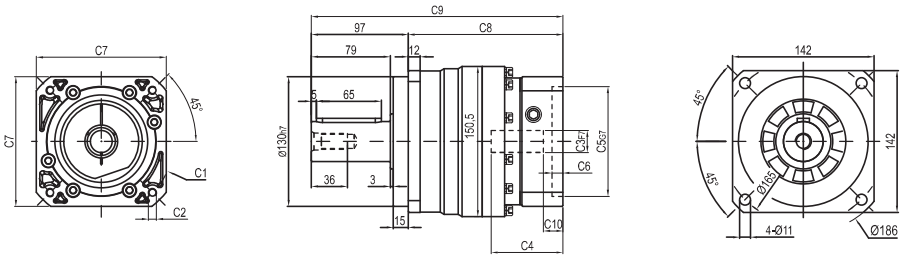
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-120D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	137	199	19.5
FE-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114. 3	10	180	154.5	216.5	28
FE-120D-L2	Ø90	4-M5x12 , 4-M6x14	Ø19	42	Ø70	6.5	80	153.5	215.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	153.5	215.5	6
FE-120M1-L2	Ø115	4-M8x20	Ø19,Ø22	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 / OUTLINE DIMENSION SHEET

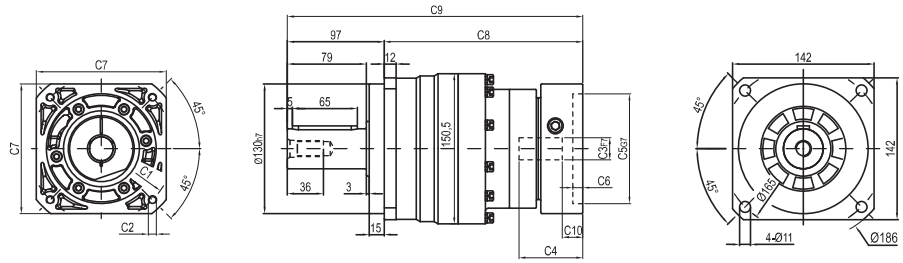
FB-142D(M1)-L1

输入端/ INPUT　　输出端/OUTPUT

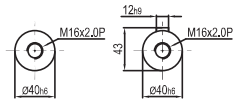


FB-142D(M1)-L2

输入端/ INPUT　　输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

尺寸	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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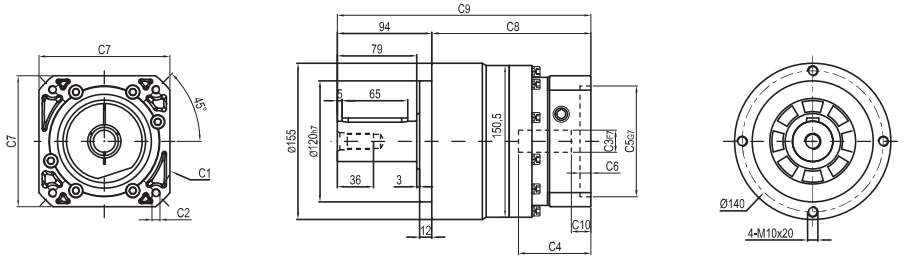
外形尺寸图表 / OUTLINE DIMENSION SHEET

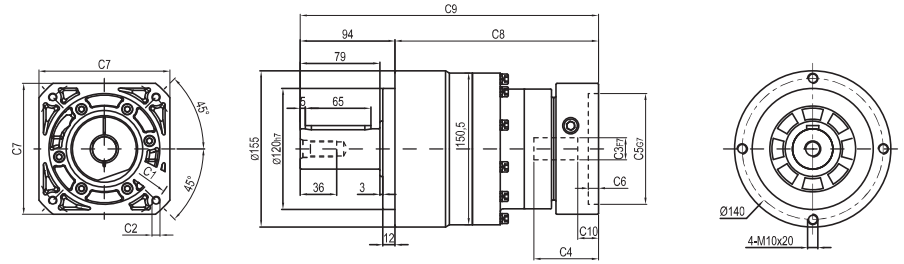
FE-155D(M1)-L1

输入端 / INPUT　　输出端 / OUTPUT

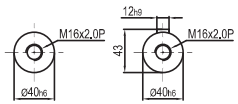


FE-155D(M1)-L2

输入端 / INPUT　　输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

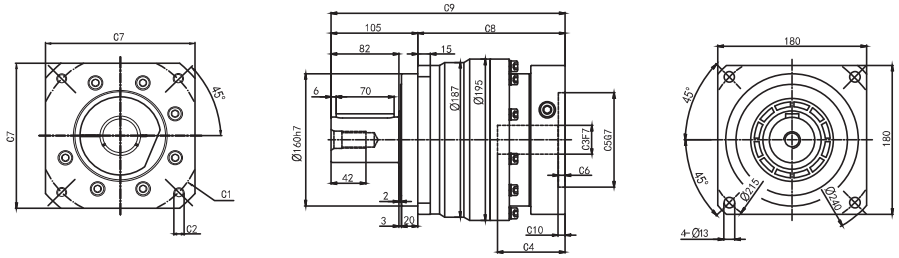
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-155D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	158	252	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	168	262	25
FE-155D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	202	296	19.5
FE-155M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	219.5	313.5	28

* 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 / OUTLINE DIMENSION SHEET

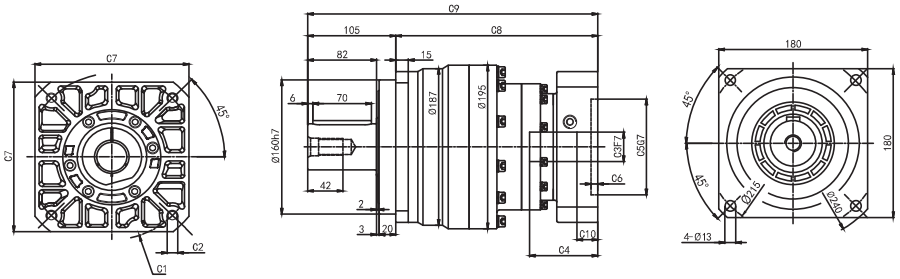
FB-180D-L1

输入端 / INPUT　　输出端 / OUTPUT

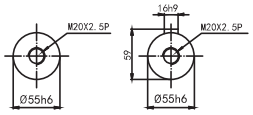


FB-180D-L2

输入端 / INPUT　　输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

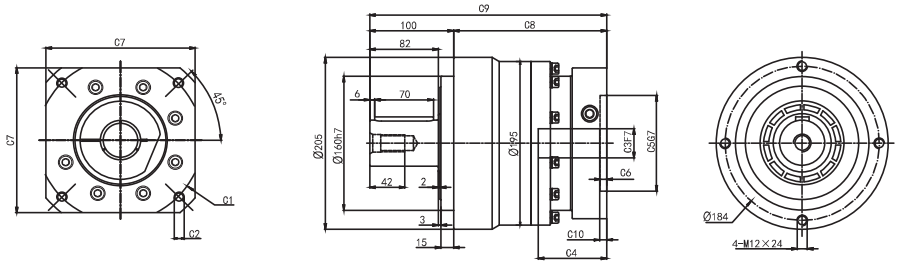
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-180D-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	178	283	8.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	213.5	318.5	45.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	183	288	13.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	213.5	318.5	45.5
FB-180D-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	231	336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

外形尺寸图表 / OUTLINE DIMENSION SHEET

FE-205D-L1

输入端 / INPUT　　输出端 / OUTPUT



FE-205D-L2

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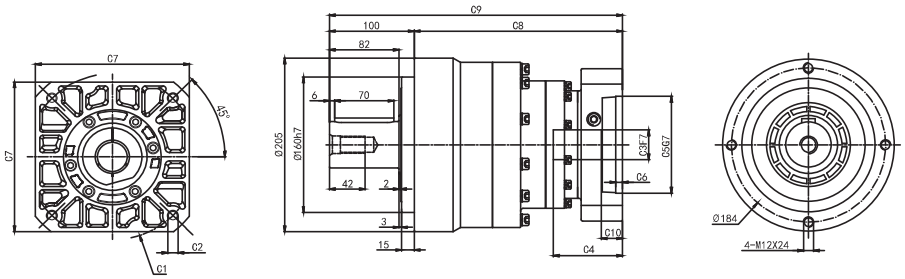
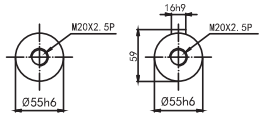


输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

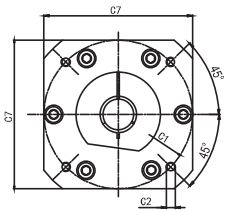
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-205D-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	183	283	8.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	218.5	318.5	45.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	188	288	13.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	218.5	318.5	45.5
FE-205D-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	236	336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

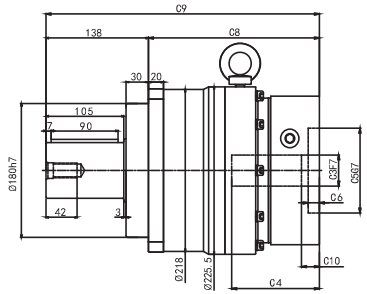
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

FB-220D-L1

输入端 / INPUT





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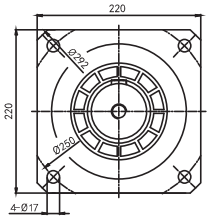

FB-220D-L2

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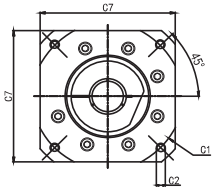
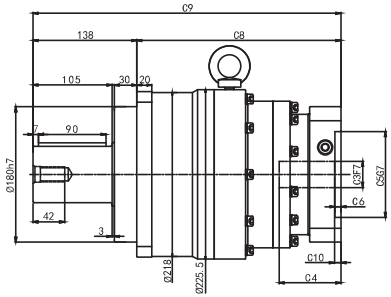
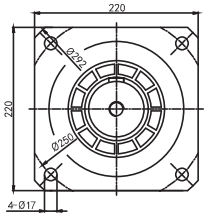
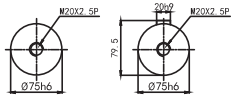




输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

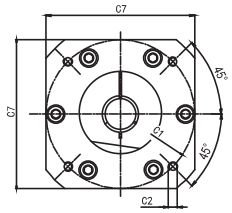
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-220D-L1	Ø200	4-M12x28	Ø35,Ø42	118	Ø114.3	15	200	230	368	24
	Ø215	4-M12x30	Ø38	108	Ø180	8	200	220	358	11.5
	Ø235	4-M12x30	Ø42,Ø55	118	Ø200	10	220	230	368	24
FB-220D-L2	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	271.5	409.5	8.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	307	445	45.5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

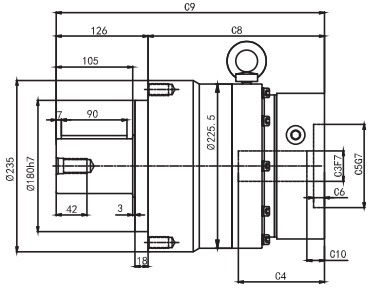
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

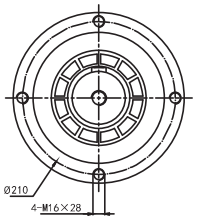
FE-235D-L1

输入端 / INPUT



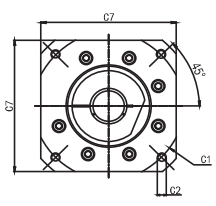


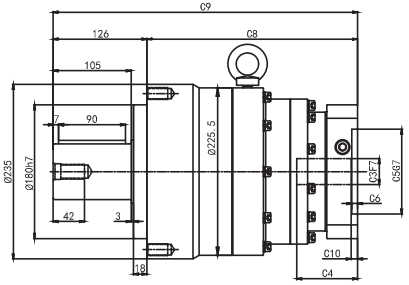
输出端 / OUTPUT



FE-235D-L2

输入端 / INPUT





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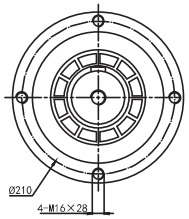
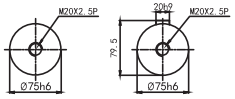


输出轴径/Output Diameter

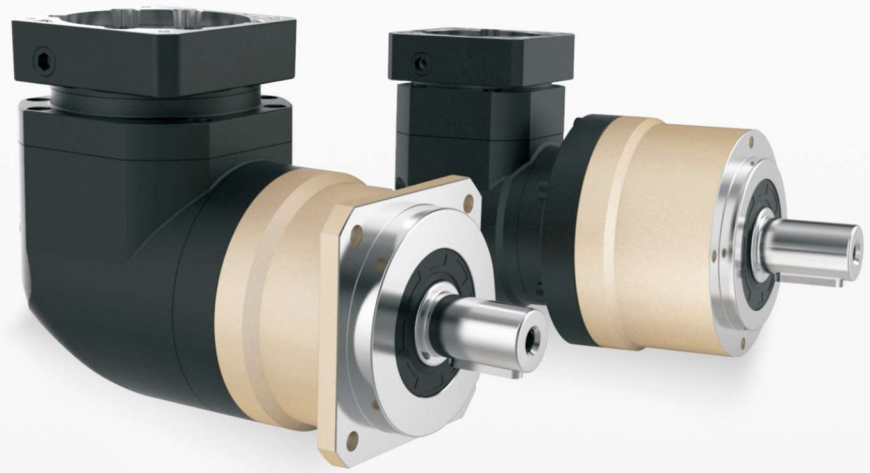


轴型式 S1　　轴型式 S2

尺寸	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

FBR/FER
SERIES



型号说明 / MODEL ILLUMINATION

FBR090 – 10 – S2 – 马达

减速机型式：FBR060/FER070
FBR090/FER090
FBR115/FER120
FBR142/FER155
FBR180/FER205
FBR220/FER235

输出轴型式选择：S1：平滑直轴
S2：附件直轴

马达型号：
马达制造及型号

减速比：单级（L1）：3,4,5,6,7,8,10,14,20
双级（L2）：12,15,20,25,30,35,40,50,60,
70,80,100,120,140,160,200

选用范例：FBR090-10-S2/MHMD-082G1U

减速机性能资料 / GEAR BOX PERFORMANCE INFORMATION

规 格		级 数	减速比[1]	FBR060 FER070	FBR090 FER090	FBR115 FER120	FBR142 FER155	FBR180 FER205	FBR220 FER235
额定输出力矩T_{2N}	Nm	1	3	55	130	208	342	588	1,140
			4	50	140	290	542	1,050	1,700
			5	60	160	330	650	1,200	2,000
			6	55	150	310	600	1,100	1,900
			7	50	140	300	550	1,100	1,800
			8	50	140	290	542	1,050	1,700
			10	60	160	330	650	1,200	2,000
			14	50	140	300	550	1,100	1,800
			20	40	100	230	450	900	1,500
		2	12	55	130	208	342	588	1,140
			15	55	130	208	342	588	1,140
			20	50	140	290	542	1,050	1,700
			25	60	160	330	650	1,200	2,000
			30	55	130	208	342	588	1,140
			35	60	160	330	650	1,200	2,000
			40	50	140	290	542	1,050	1,700
			50	60	160	330	650	1,200	2,000
			60	55	150	310	600	1,100	1,900
			70	60	160	330	650	1,200	2,000
			80	50	140	290	542	1,050	1,700
			100	60	160	330	650	1,200	2,000
			120	–	150	310	600	1,100	1,900
			140	–	140	300	550	1,100	1,800
			160	–	120	260	500	1,000	1,600
			200	–	100	230	450	900	1,500
最大输出力矩T_{2B}	Nm	1,2	3~200	3倍额定输出力矩					
额定输入转速n_1	rpm	1,2	3~200	5,000	4,000	4,000	3,000	3,000	2,000
最大输入转速n_{1B}	rpm	1,2	3~200	10,000	8,000	8,000	6,000	6,000	4,000
背隙	arcmin	1	3~20	≤10	≤10	≤10	≤10	≤10	≤10
		2	12~200	≤12	≤12	≤12	≤12	≤12	≤12
扭转刚性	Nm/arcmin	1,2	3~200	7	14	25	50	145	225
容许径向力F_{2rB}[2]	N	1,2	3~200	1,530	3,250	6,700	9,400	14,500	50,000
容许轴向力F_{2a1B}[2]	N	1,2	3~200	630	1,300	3,000	4,000	6,200	35,000
容许轴向力F_{2a2B}[2]	N	1,2	3~200	765	1,625	3,350	4,700	7,250	25,000
使用寿命	hr	1,2	3~200	20,000*					
效率 η	%	1	3~20	≤95%					
		2	12~200	≤92%					
重量	kg	1	3~20	2.1	6.4	13	24.5	51	83
		2	12~200	2.5	7.8	14.2	27.5	54	95
使用温度	℃	1,2	3~200	-10℃~+90℃					
润滑		1,2	3~200	合成润滑油脂					
防护等级		1,2	3~200	IP65					
安装方向		1,2	3~200	任意方向					
噪音值（n_1=3000rpm）	dB	1,2	3~200	≤63	≤65	≤68	≤70	≤72	≤74

减速机转动惯量

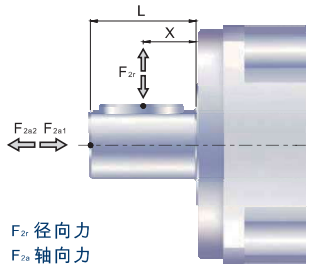
规 格		级 数	减速比[1]	FBR060 FER070	FBR090 FER090	FBR115 FER120	FBR142 FER155	FABR180 FER205	FABR220 FER235
转动惯量J_1	kg · cm²	1	3~7	0.35	2.25	6.84	23.4	68.9	135.4
			8~10	0.07	1.87	6.25	21.8	65.6	119.8
			14~20	0.07	1.87	6.25	21.8	65.6	119.8
		2	12~40	0.35	0.35	2.25	6.84	23.4	68.9
			50	0.07	0.31	1.87	6.25	21.8	65.6
			60	0.07	0.35	2.25	6.84	23.4	68.9
			70~100	0.07	0.31	1.87	6.25	21.8	65.6
			120~200	0.07	0.31	1.87	6.25	21.8	65.6

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

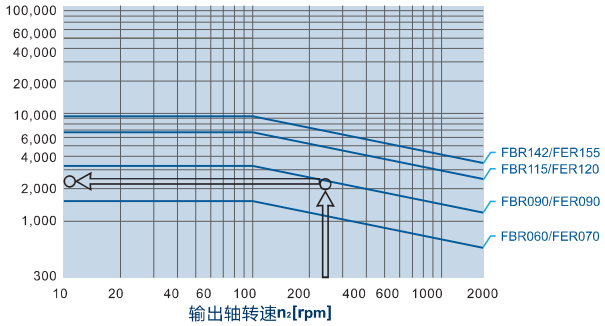
REDUCER OUTPUT SHAFT OF THE PERMISSIBLE RADIAL FORCE AND SHAFT AND FORCE



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.

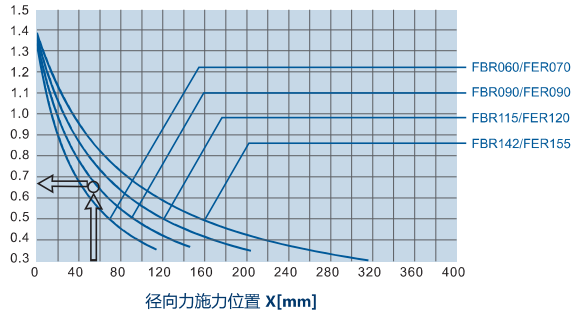
容许径向力 F_{2rB}[N] 施力于轴中心位置



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:

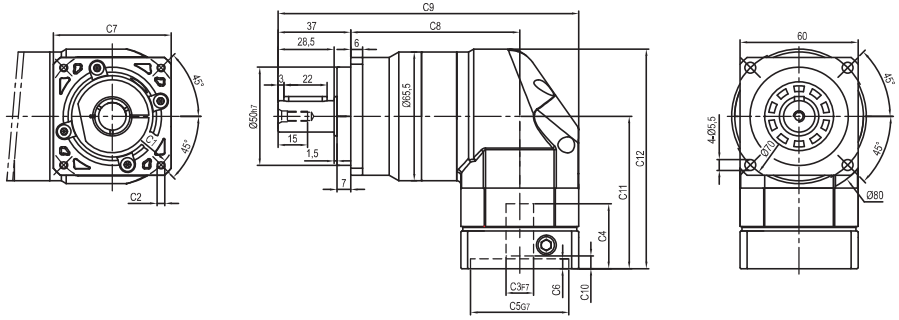
$F'_{2a1B}=0.2xF'_{2rB}$
$F'_{2a2B}=0.1xF'_{2rB}$

*连续运转降低使用寿命二分之一。

外形尺寸图表 / OUTLINE DIMENSION SHEET

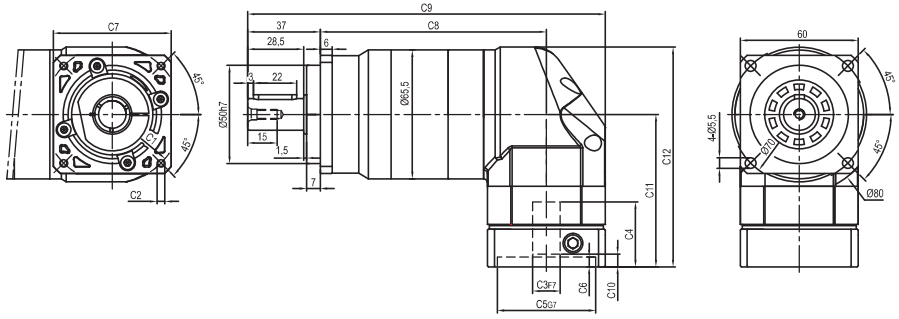
FBR-060D(M1)-L1

输入端 / INPUT　　输出端 / OUTPUT

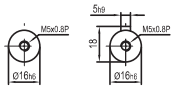


FBR-060D(M1)-L2

输入端 / INPUT　　输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1　轴型式 S2

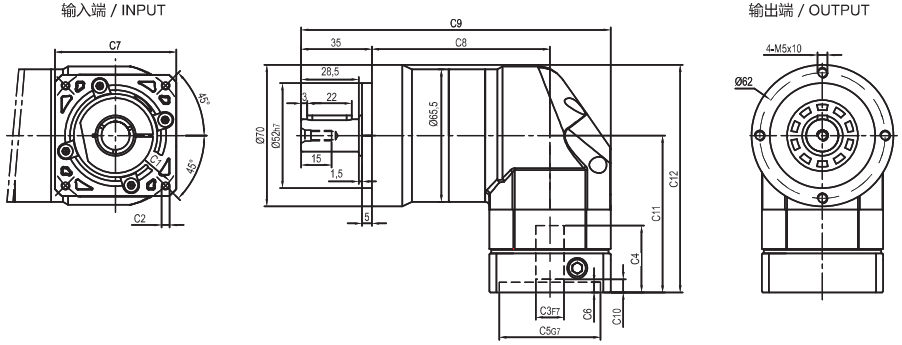
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-060D-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	86	153	5.5	77.5	111.75
FBR-060D-L2								115	182			
FBR-060D-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	86	153	5.5	77.5	111.75
FBR-060D-L2								115	182			
FBR-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	86	163	12	87	121.25
FBR-060M1-L2								115	192			

* 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 / OUTLINE DIMENSION SHEET

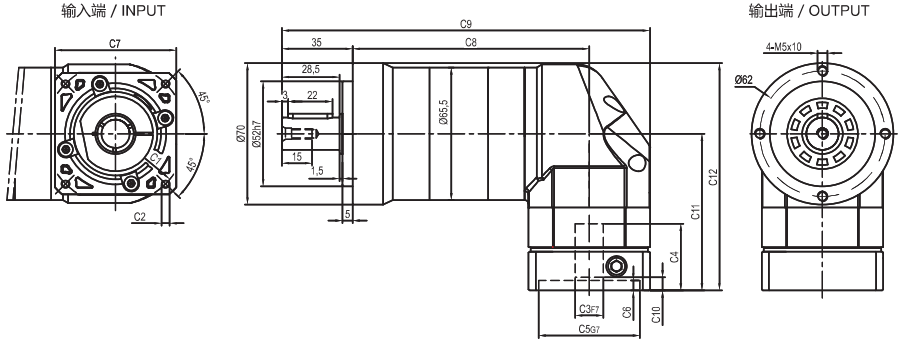
FER-070D(M1)-L1

输入端 / INPUT　　输出端 / OUTPUT

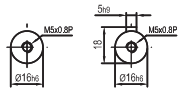


FER-070D(M1)-L2

输入端 / INPUT　　输出端 / OUTPUT



输出轴径/Output Diameter



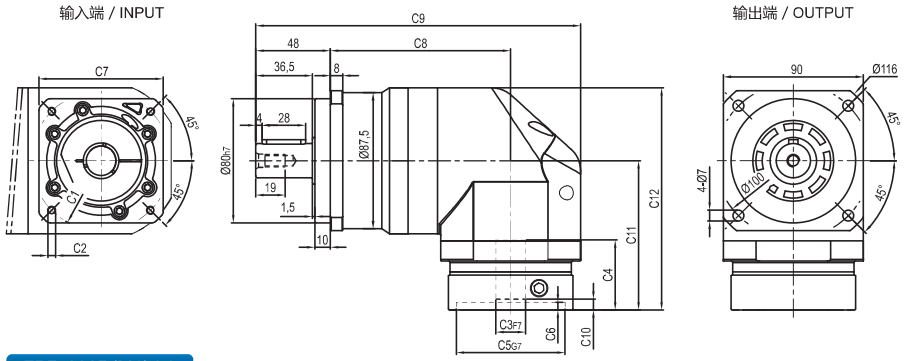
轴型式 S1　轴型式 S2

尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-070D-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	88	153	5.5	77.5	112.5
FER-070D-L2								117	182			
FER-070D-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	88	153	5.5	77.5	112.5
FER-070D-L2								117	182			
FER-070M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	88	163	12	87	122
FER-070M1-L2								117	192			

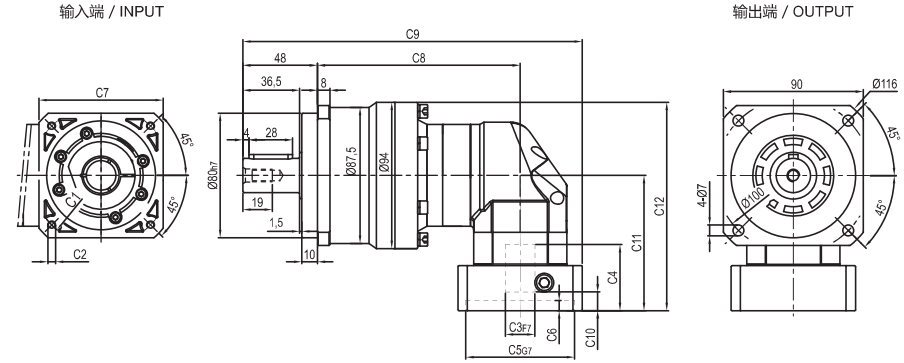
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

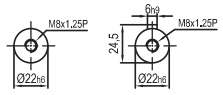
FBR-090D(M1)-L1



FBR-090D(M1)-L2



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	116	209	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	116	209	6	96	143
FBR-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	116	214	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	116	229	19	120	167
FBR-090D-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	130.5	208.5	5.5	77.5	124.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	130.5	208.5	5.5	77.5	124.5
FBR-090M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	130.5	218.5	12	87	134
	Ø100	4-M6x14	Ø16	42.5	Ø80	6.5	86	130.5	221.5	11	87	134

* 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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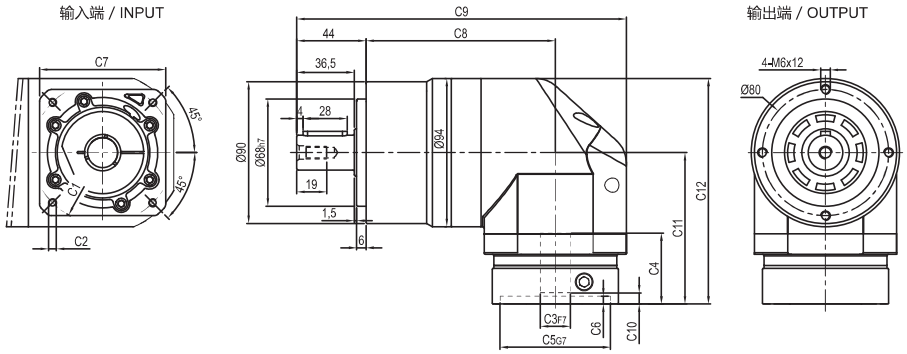
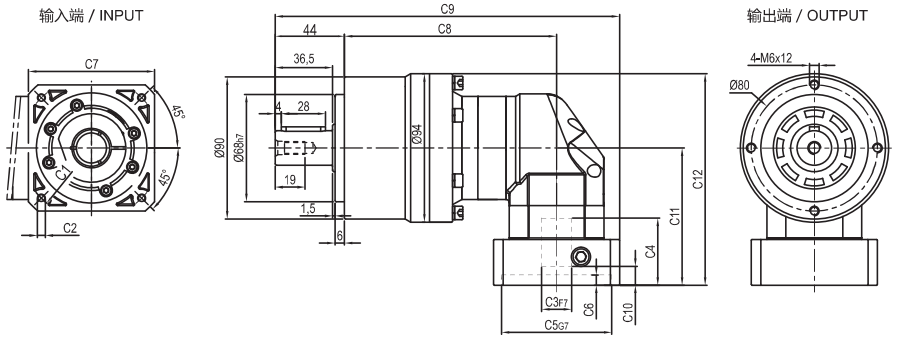
FBR/FER系列

外形尺寸图表 / OUTLINE DIMENSION SHEET

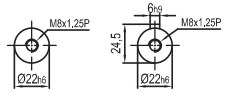
FER-090D(M1)-L1



FER-090D(M1)-L2



输出轴径/Output Diameter



轴型式 S1　　轴型式 S2

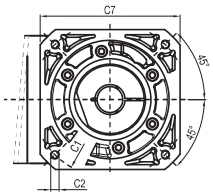
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	120	209	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	120	209	6	96	143
FER-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	120	214	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	120	229	19	120	167
FER-090D-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	134.5	208.5	5.5	77.5	124.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	134.5	208.5	5.5	77.5	124.5
FER-090M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	134.5	218.5	12	87	134
	Ø100	4-M6x14	Ø16	42.5	Ø80	6.5	86	134.5	221.5	11	87	134

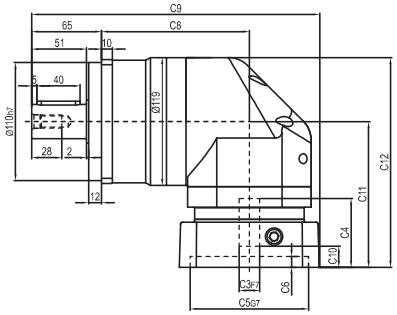
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

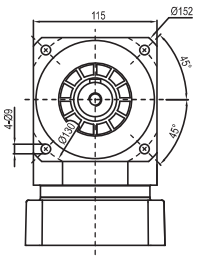
FBR-115D(M1)-L1

输入端 / INPUT



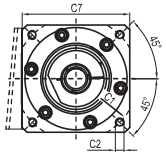


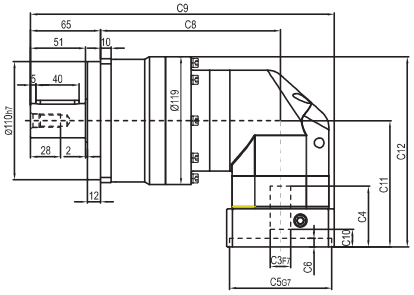
输出端 / OUTPUT



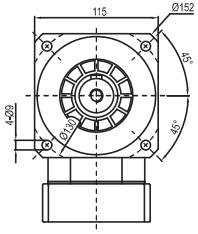
FBR-115D(M1)-L2

输入端 / INPUT

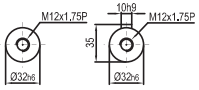




输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1　轴型式 S2

尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-115D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	137.5	267.5	19.5	135.5	195
FBR-115M1-L1	Ø200	4-M12x28	Ø35	81	Ø114. 3	10	180	137.5	292.5	28	152.5	212
FBR-115D-L2	Ø90	4-M5x12 ,4-M6x14	Ø19	45	Ø70	6.5	80	167.5	277.5	7	96	155.5
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	167.5	277.5	6	96	155.5
FBR-115M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	167.5	282.5	16.5	117.5	177
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	167.5	297.5	19	120	179.5

* 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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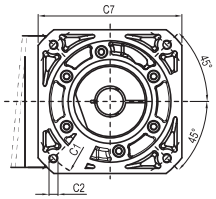
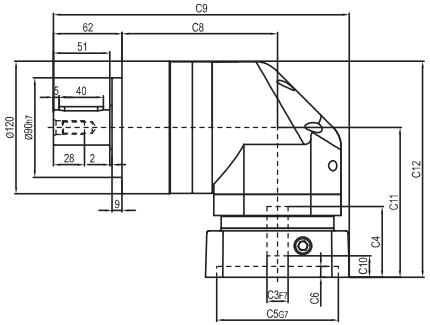
外形尺寸图表 / OUTLINE DIMENSION SHEET

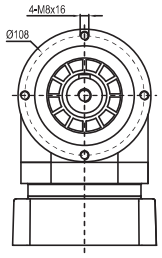
FER-120D(M1)-L1

输入端 / INPUT



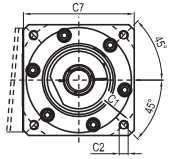


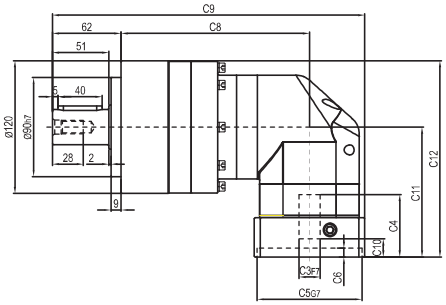
输出端 / OUTPUT



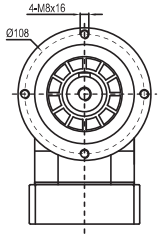
FER-120D(M1)-L2

输入端 / INPUT

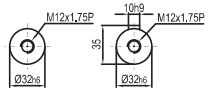




输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1　轴型式 S2

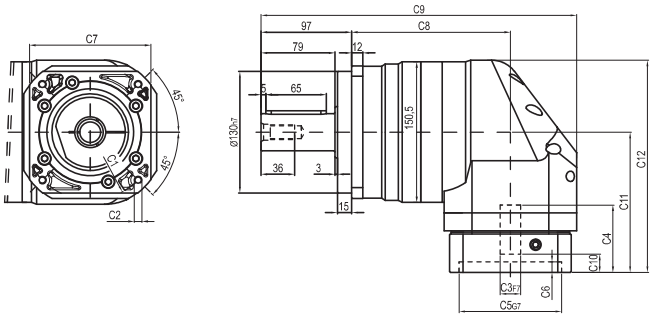
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-120D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	140.5	267.5	19.5	135.5	195.5
FER-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114,3	10	180	140.5	292.5	28	152.5	212.5
FER-120D-L2	Ø90	4-M5x12 , 4-M6x14	Ø19	45	Ø70	6.5	80	170.5	277.5	7	96	156
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	170.5	277.5	6	96	156
FER-120M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	170.5	282.5	16.5	117.5	177.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	170.5	297.5	19	120	180

* 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

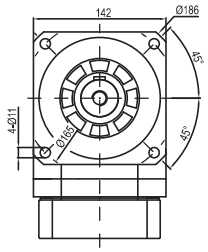
外形尺寸图表 / OUTLINE DIMENSION SHEET

FBR-142D(M1)-L1

输入端 / INPUT

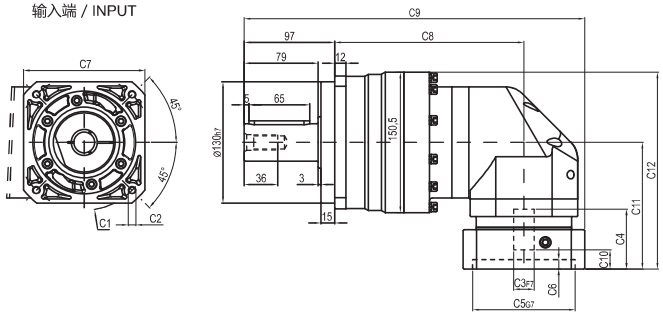


输出端 / OUTPUT

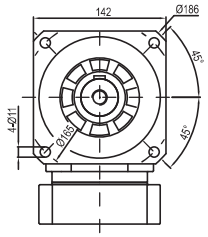


FBR-142D(M1)-L2

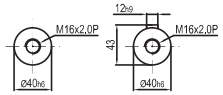
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1　轴型式 S2

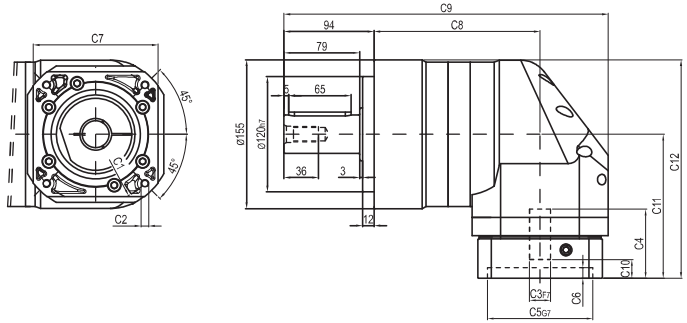
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-142D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	170	338	19.5	150	227.25
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	170	357	25	160	237.25
FBR-142D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	202.5	364.5	19.5	135.5	210.75
FBR-142M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	202.5	389.5	28	152.5	227.75

* 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

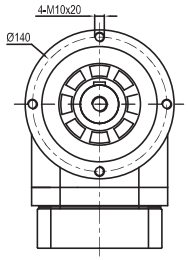
外形尺寸图表 / OUTLINE DIMENSION SHEET

FER-155D(M1)-L1

输入端 / INPUT

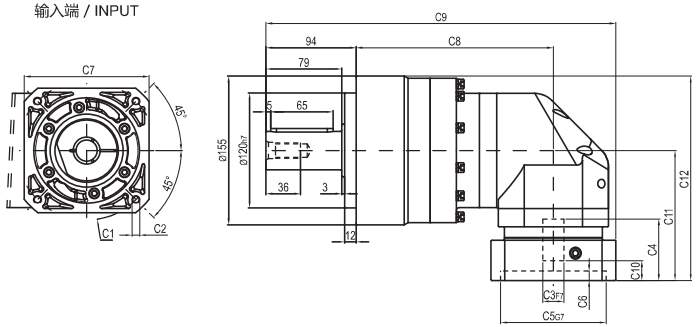


输出端 / OUTPUT

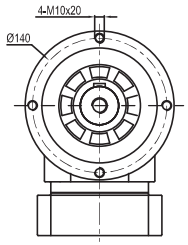


FER-155D(M1)-L2

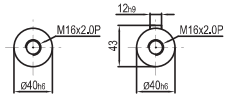
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1　轴型式 S2

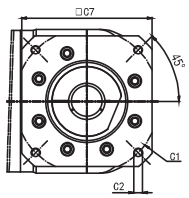
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-155D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	173	338	19.5	150	227.5
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	173	357	25	160	237.5
FER-155D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	205.5	364.5	19.5	135.5	213
FER-155M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	205.5	389.5	28	152.5	230

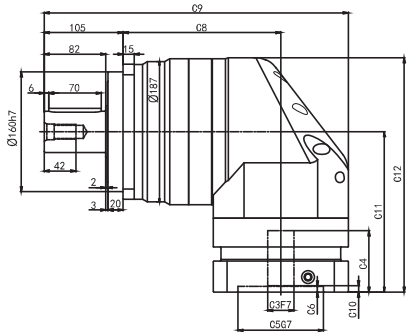
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

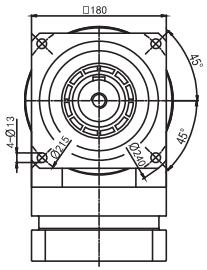
FBR-180D-L1

输入端 / INPUT



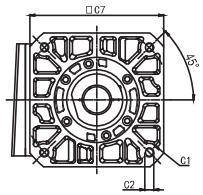


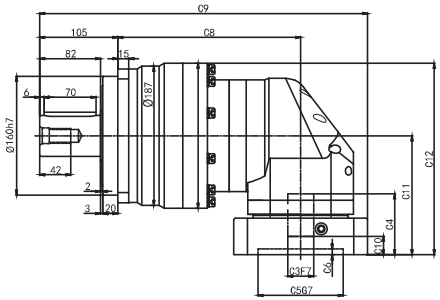
输出端 / OUTPUT



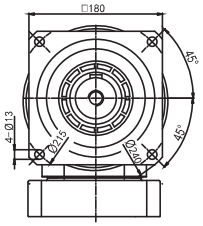
FBR-180D-L2

输入端 / INPUT

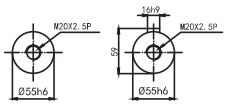




输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1　轴型式 S2

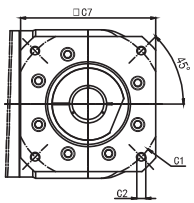
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-180D-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	210.5	405.5	8.5	214	313
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	210.5	405.5	45.5	249.5	348.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	210.5	411.5	13.5	219	318
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	213.5	318.5	45.5	249.5	348.5
FBR-180D-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	246	422	19.5	150	247.5
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	246	441	25	160	257.5

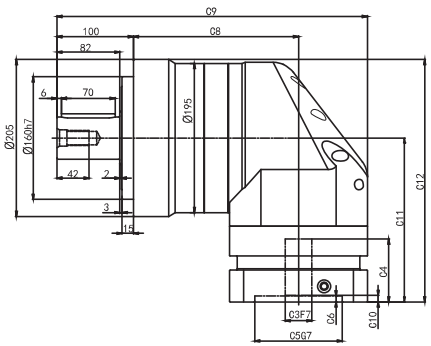
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

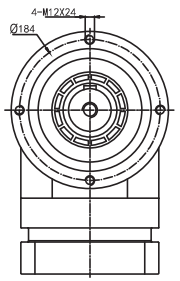
FER-205D-L1

输入端 / INPUT



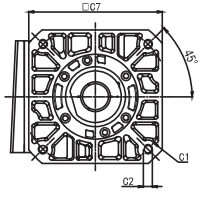


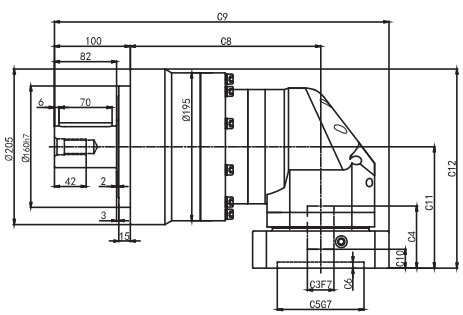
输出端 / OUTPUT



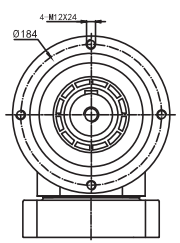
FER-205D-L2

输入端 / INPUT

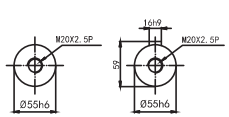




输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1　轴型式 S2

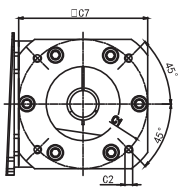
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-205D-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	215.5	405.5	8.5	214	318
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	215.5	405.5	45.5	249.5	353.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	215.5	411.5	13.5	219	323
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	218.5	318.5	45.5	249.5	353.5
FER-205D-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	251	422	19.5	150	252.5
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	251	441	25	160	262.5

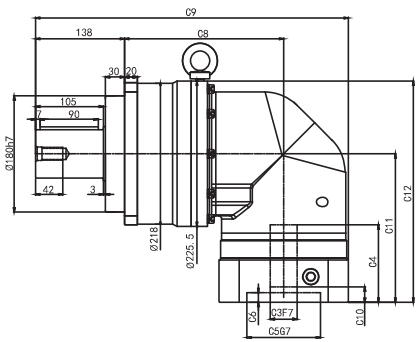
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

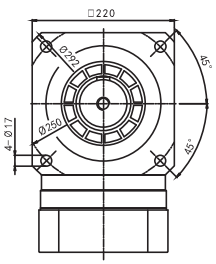
FBR-220D-L1

输入端 / INPUT



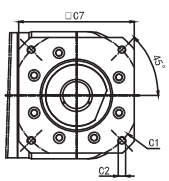


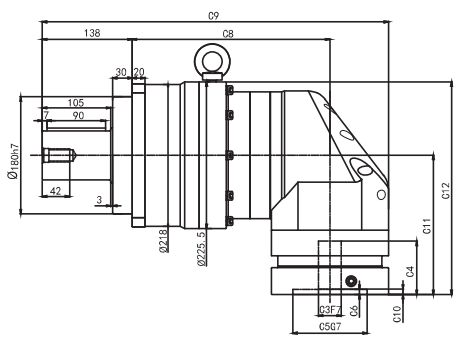
输出端 / OUTPUT



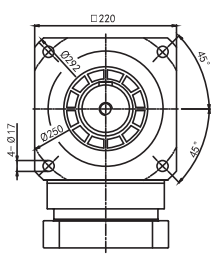
FBR-220D-L2

输入端 / INPUT

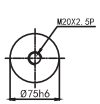




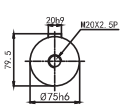
输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1



轴型式 S2

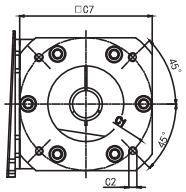
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-220D-L1	Ø200	4-M12x28	Ø35,Ø42	120	Ø114.3	15	200	246.5	484.5	24	230	342.75
	Ø215	4-M12x30	Ø38	110	Ø180	8	200	246.5	484.5	11.5	220	332.75
	Ø235	4-M12x30	Ø42,Ø55	120	Ø200	10	220	246.5	494.5	24	230	342.75
FBR-220D-L2	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	304	532	8.5	214	326.75
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	304	532	45.5	249.5	362.25
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	304	538	13.5	219	331.75
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	304	552	45.5	249.5	362.25

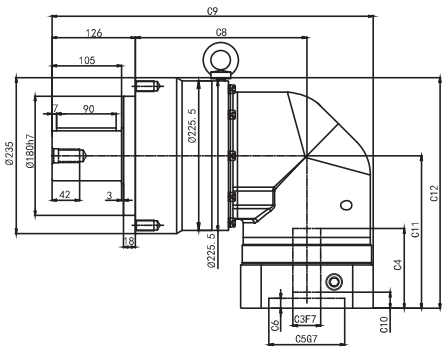
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

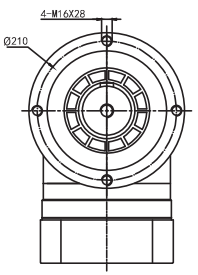
FER-235D-L1

输入端 / INPUT



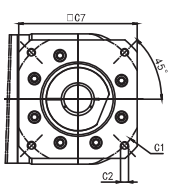


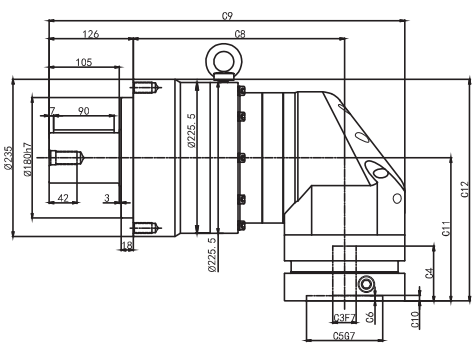
输出端 / OUTPUT



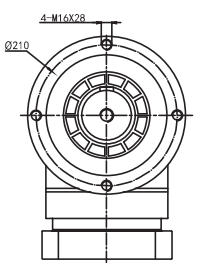
FER-235D-L2

输入端 / INPUT

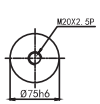




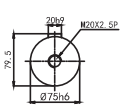
输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1



轴型式 S2

尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-235D-L1	Ø200	4-M12x28	Ø35,Ø42	120	Ø114.3	15	200	258.5	484.5	24	230	347.5
	Ø215	4-M12x30	Ø38	110	Ø180	8	200	258.5	484.5	11.5	220	337.5
	Ø235	4-M12x30	Ø42,Ø55	120	Ø200	10	220	258.5	494.5	24	230	347.5
FER-235D-L2	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	316	532	8.5	214	331.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	316	532	45.5	249.5	367
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	316	538	13.5	219	336.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	316	552	45.5	249.5	367

* 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

FG/FGA
SERIES

型号说明 / MODEL ILLUMINATE

FG 080 — 10 / 马达

减速机型式：
FG040/FGA040/FG060/FGA060/FG080
FGA080/FG120/FGA120/FG160/FGA160

减速比：单级(L1)：3,4,5,6,7,8,10
双级(L2)：12,15,20,25,30,35,
40,50,60,70,80,100

马达型号：
马达制造及型号

选用范例：FG080-10/MHMD-082G1U

减速机性能资料 / GEAR BOX PERFORMANCE INFORMATION

规 格		级 数	减速比[1]	FG040 FGA040	FG060 FGA060	FG080 FGA080	FG120 FGA120	FG160 FGA160
额定输出力矩T_{2N}	Nm	1	3	20	55	130	208	342
			4	19	50	140	290	542
			5	22	60	160	330	650
			6	20	55	150	310	600
			7	19	50	140	300	550
			8	17	45	120	260	500
			10	14	40	100	230	450
		2	12	20	55	130	208	342
			15	20	55	130	208	342
			20	19	50	140	290	542
			25	22	60	160	330	650
			30	22	55	130	208	342
			35	22	60	160	330	650
			40	22	50	140	290	542
			50	22	60	160	330	650
			60	20	55	150	310	600
			70	19	50	140	300	550
			80	17	45	120	260	500
			100	14	40	100	230	450
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
最大输入转速n_{1B}	rpm	1,2	3~100	10,000	10,000	8,000	8,000	6,000
背隙	arcmin	1	3~10	≤8	≤8	≤8	≤8	≤8
		2	12~100	≤10	≤10	≤10	≤10	≤10
扭转刚性	Nm/arcmin	1,2	3~100	3	7	14	25	50
容许径向力F_{2a}[2]	N	1,2	3~100	780	1,530	3,250	6,700	9,400
容许轴向力F_{2a1B}[2]	N	1,2	3~100	350	630	1,300	3,000	4,000
容许轴向力F_{2a2B}[2]	N	1,2	3~100	390	765	1,625	3,350	4,700
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
		2	12~100	0.8	1.9	4.1	9	17.5
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

减速机转动惯量

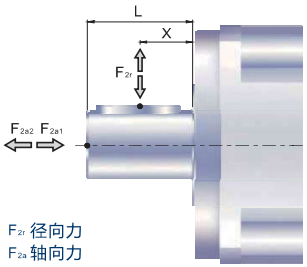
规 格		级 数	减速比[1]	FG040 FGA040	FG060 FGA060	FG080 FGA080	FG120 FGA120	FG160 FGA160
转动惯量J_1	kg·cm²	1	3	0.03	0.16	0.61	3.25	9.21
			4	0.03	0.14	0.48	2.74	7.54
			5	0.03	0.13	0.47	2.71	7.42
			6	0.03	0.13	0.45	2.65	7.25
			7	0.03	0.13	0.45	2.62	7.14
			8	0.03	0.13	0.44	2.58	7.07
			10	0.03	0.13	0.44	2.57	7.03
		2	12	0.03	0.03	0.13	0.47	2.71
			15	0.03	0.03	0.13	0.47	2.71
			20	0.03	0.03	0.13	0.47	2.71
			25	0.03	0.03	0.13	0.47	2.71
			30	0.03	0.03	0.13	0.47	2.71
			35	0.03	0.03	0.13	0.47	2.71
			40	0.03	0.03	0.13	0.47	2.71
			50	0.03	0.03	0.13	0.44	2.57
			60	0.03	0.03	0.13	0.44	2.57
			70	0.03	0.03	0.13	0.44	2.57
			80	0.03	0.03	0.13	0.44	2.57
			100	0.03	0.03	0.13	0.44	2.57

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。

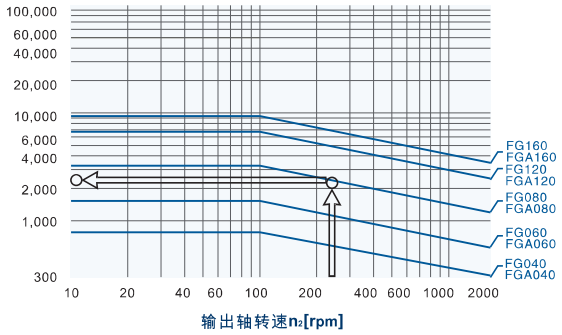
减速机输出轴之容许径向力及轴向力

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



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。

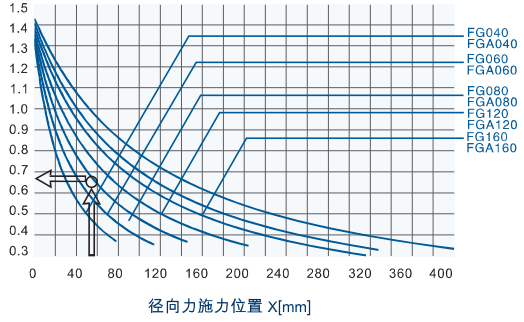
容许径向力 F_{2rB}[N] 施力于轴中心位置



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

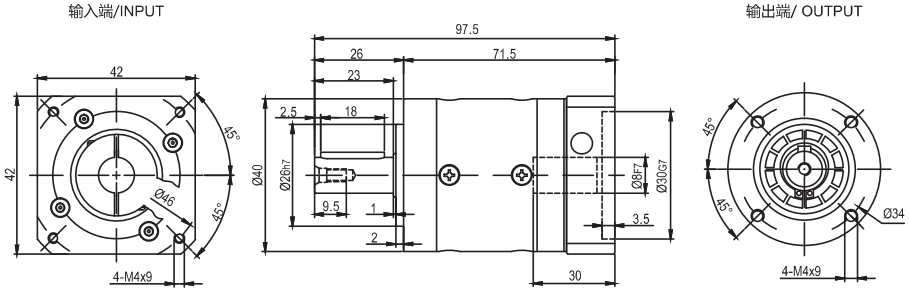


当径向力F_{2r}施力不在轴中心位置时，越靠近减速机即X＜1/2xL，所能承受之容许径向力变大，越远离减速机即X＞1/2xL时，所能承受之容许径向力则变小，藉由左图，依减速机规格及径向力施力位置X，查出位置负荷洗漱K_b，在代入下列公式，求出容许
径向力：
$F'_{2rB}=KbxF_{2rB}$
轴向力:
$F'_{2a1B}=0.2xF'_{2rB}$
$F'_{2a2B}=0.1xF'_{2rB}$

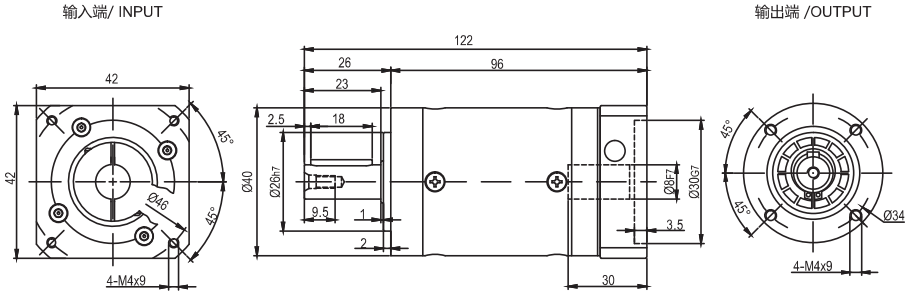
＊连续运转降低使用寿命二分之一。

外形尺寸图表 / OUTLINE DIMENSION SHEET

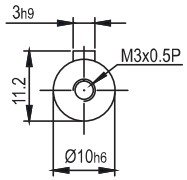
FG-040-L1



FG-040-L2



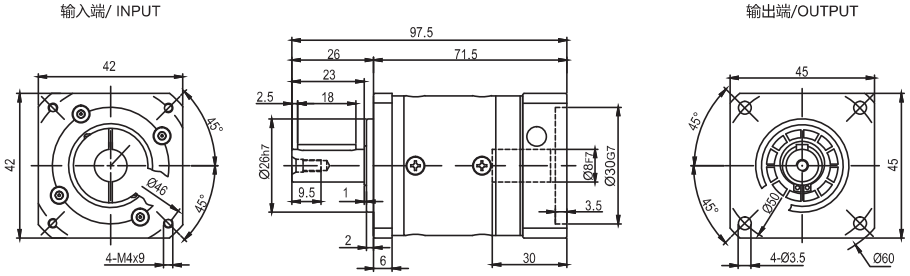
输出轴径/Output Diameter



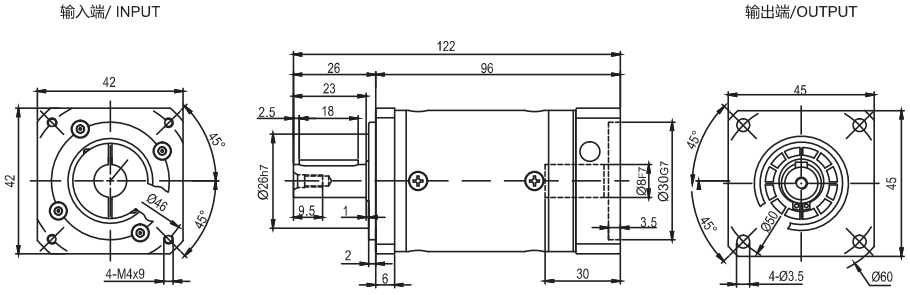
*输入马达连接板之尺寸,可根据客户要求单独定做。
*The input motor specific dimensions could be customised.

外形尺寸图表 / OUTLINE DIMENSION SHEET

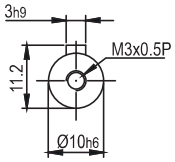
FGA-040-L1



FGA-040-L2



输出轴径/Output Diameter

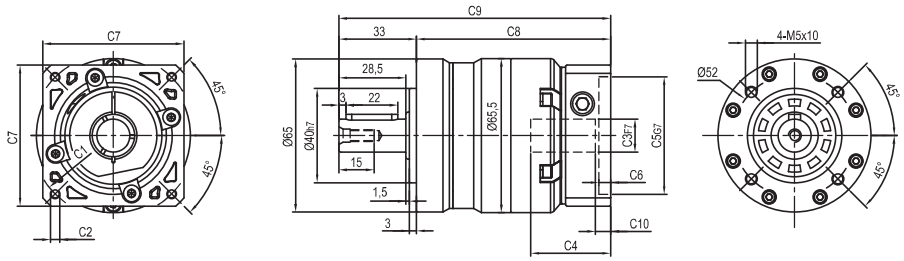


*输入马达连接板之尺寸,可根据客户要求单独定做。
*The input motor specific dimensions could be cumised.

外形尺寸图表 / OUTLINE DIMENSION SHEET

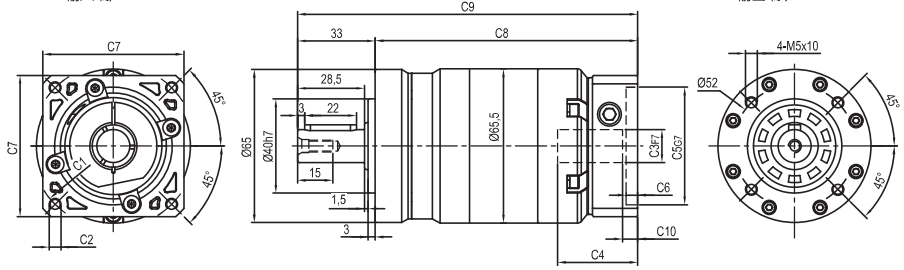
FG-060D(M1)-L1

输入端/INPUT　　输出端/ OUTPUT

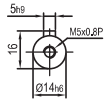


FG-060D(M1)-L2

输入端/ INPUT　　输出端 /OUTPUT



输出轴径/Output Diameter



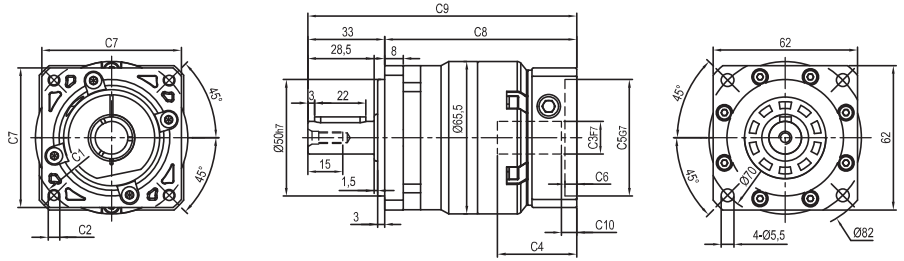
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FG-060D-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	82.5	115.5	5.5
FG-060D-L2								111.5	144.5	5.5
FG-060D-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	82.5	115.5	5.5
FG-060D-L2								111.5	144.5	5.5
FG-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	89	122	12
FG-060M1-L2								118	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 / OUTLINE DIMENSION SHEET

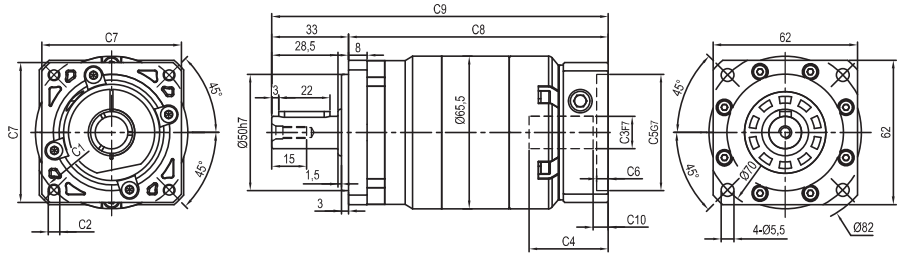
FGA-060D(M1)-L1

输入端/ INPUT　　输出端/OUTPUT

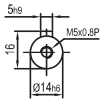


FGA-060D(M1)-L2

输入端/ INPUT　　输出端/OUTPUT



输出轴径/Output Diameter



尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FGA-060D-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	82.5	115.5	5.5
FGA-060D-L2								111.5	144.5	5.5
FGA-060D-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	82.5	115.5	5.5
FGA-060D-L2								111.5	144.5	5.5
FGA-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	89	122	12
FGA-060M1-L2								118	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。
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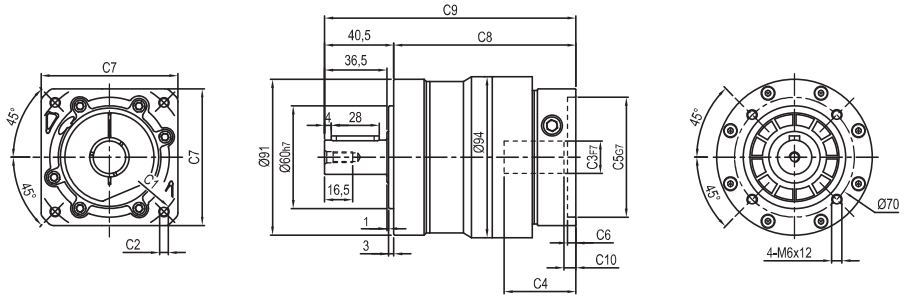
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

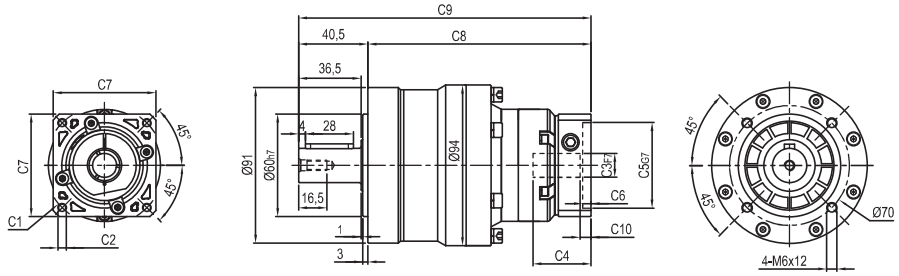
FG-080D(M1)-L1

输入端/INPUT　　输出端/ OUTPUT

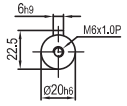


FG-080D(M1)-L2

输入端/ INPUT　　输出端 /OUTPUT



输出轴径/Output Diameter



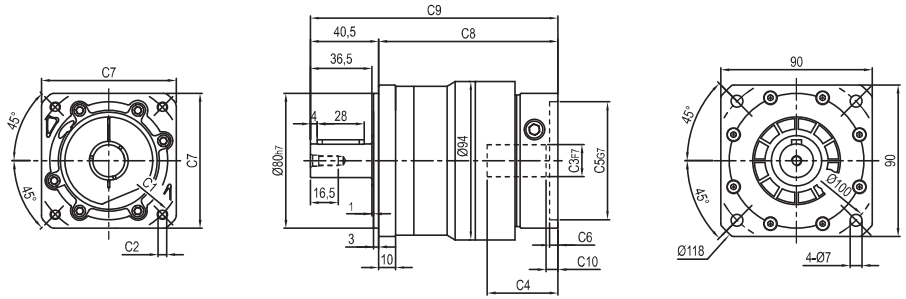
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FG-080D-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	106,5	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	106,5	147	6
FG-080M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	122	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	124.5	165	19
FG-080D-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	130.5	171	5.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	130.5	171	5.5
FG-080M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	137	177.5	12
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	137	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 / OUTLINE DIMENSION SHEET

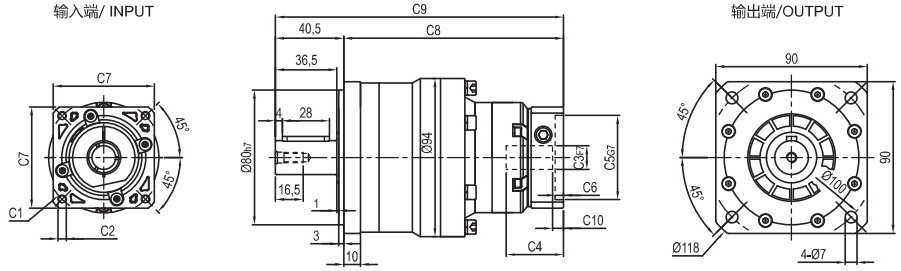
FGA-080D(M1)-L1

输入端/ INPUT　　输出端/OUTPUT

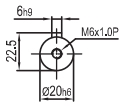


FGA-080D(M1)-L2

输入端/ INPUT　　输出端/OUTPUT



输出轴径/Output Diameter



尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FGA-080D-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	106,5	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	106,5	147	6
FGA-080M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	122	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	124.5	165	19
FGA-080D-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	130.5	171	5.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	130.5	171	5.5
FGA-080M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	137	177.5	12
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	137	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。
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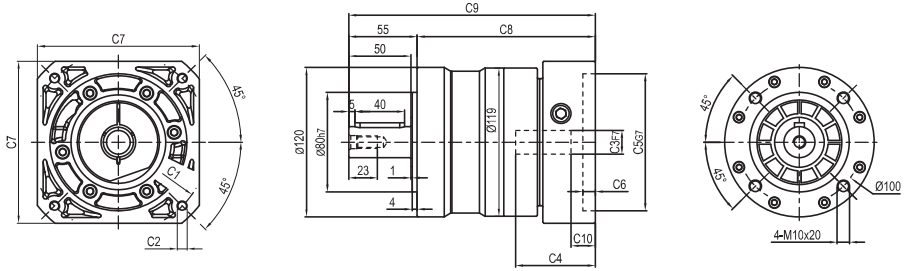
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

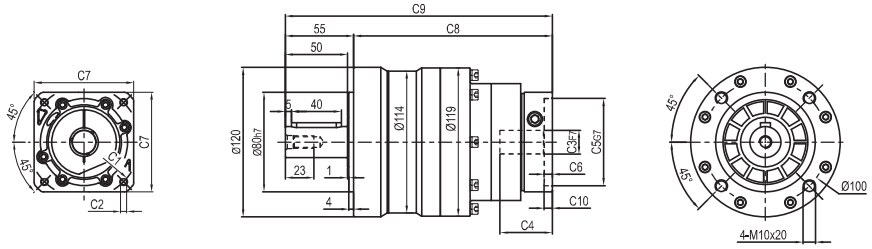
FG-120D(M1)-L1

输入端/INPUT　　输出端/ OUTPUT

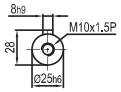


FG-120D(M1)-L2

输入端/ INPUT　　输出端 /OUTPUT



输出轴径/Output Diameter



尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FG-120D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	143	198	19.5
FG-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	160.5	215.5	28
FG-120D-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	159.5	214.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	159.5	214.5	6
FG-120M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	175	230	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	177.5	232.5	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。
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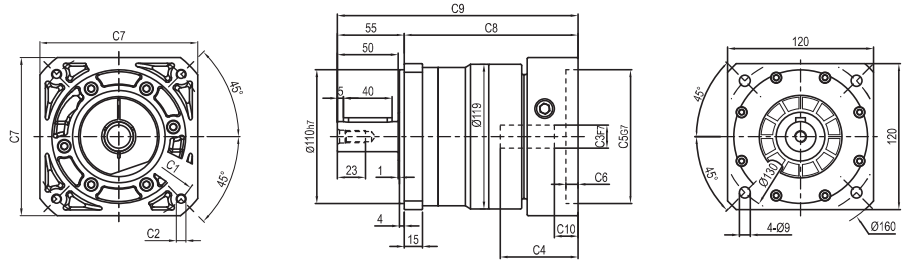
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

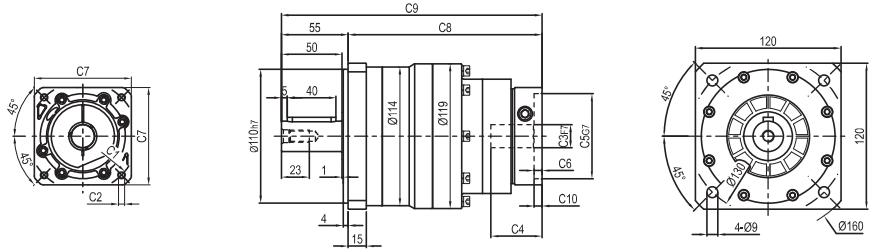
FGA-120D(M1)-L1

输入端/ INPUT　　输出端/OUTPUT

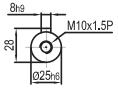


FGA-120D(M1)-L2

输入端/ INPUT　　输出端/OUTPUT



输出轴径/Output Diameter



尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FGA-120D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	143	198	19.5
FGA-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	160.5	215.5	28
FGA-120D-L2	Ø90	4-M5x12 , 4-M6x14	Ø19	42	Ø70	6.5	80	159.5	214.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	159.5	214.5	6
FGA-120M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	175	230	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	177.5	232.5	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。
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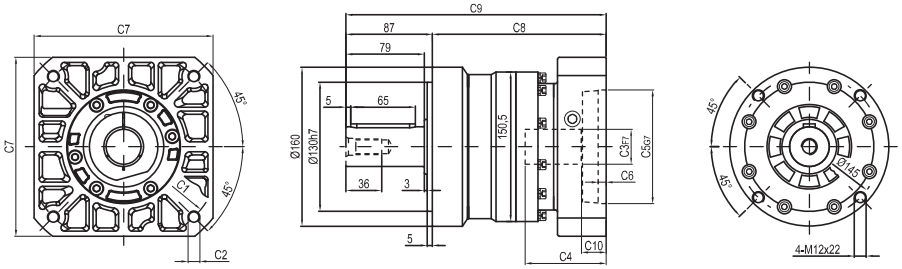
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

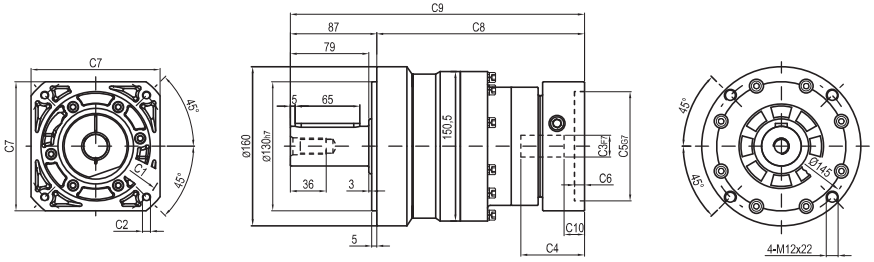
FG-160D(M1)-L1

输入端/INPUT　　输出端/ OUTPUT

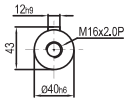


FG-160D(M1)-L2

输入端/ INPUT　　输出端 /OUTPUT



输出轴径/Output Diameter



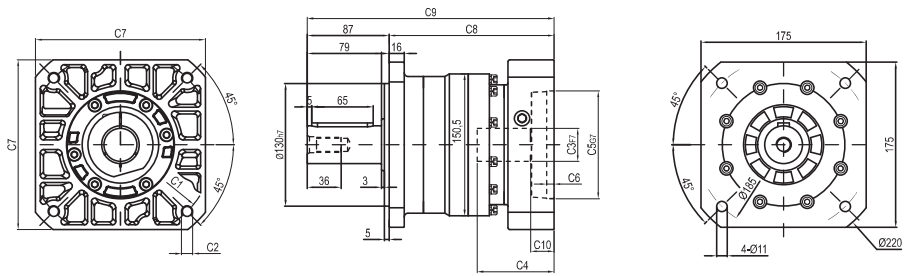
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FG-160D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	165	252	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	175	262	25
FG-160D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	209	296	19.5
FG-160M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	226.5	313.5	28

* 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 / OUTLINE DIMENSION SHEET

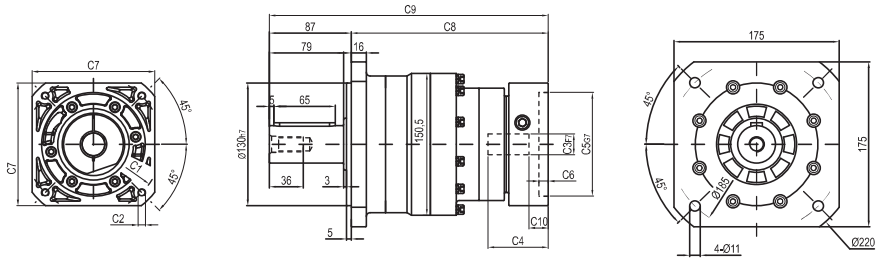
FGA-160D(M1)-L1

输入端/ INPUT　　输出端/OUTPUT

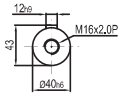


FGA-160D(M1)-L2

输入端/ INPUT　　输出端/OUTPUT



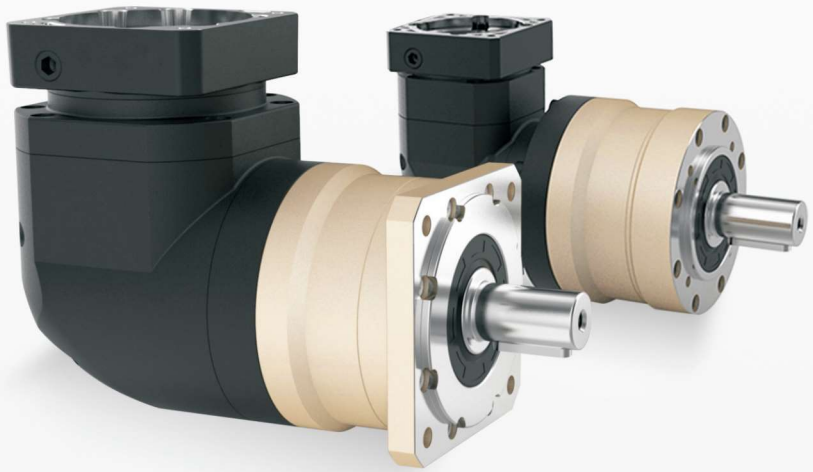
输出轴径/Output Diameter



尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FGA-160D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	165	252	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	175	262	25
FGA-160D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	209	296	19.5
FGA-160M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	226.5	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

FGR/FGAR
SERIES



型号说明 / MODEL ILLUMINATE

FGR 080 — 10 / 马达

减速机型式：
FGR060/FGAR060/FGR080/FGAR080
FGR120/FGAR120/FGR160/FGAR160

减速比：单级(L1)：3,4,5,6,7,8,10,14,20
双级(L2)：12,15,20,25,30,35,
40,50,60,70,80,100,
120,140,160,200

马达型号：
马达制造及型号

选用范例：FGR080-10/MHMD-082G1U

减速机性能资料 / GEAR BOX PERFORMANCE INFORMATION

规 格		级 数	减速比[1]	FGR060 FGAR060	FGR080 FGAR080	FGR120 FGAR120	FGR160 FGAR160
额定输出力矩T_{2N}	Nm	1	3	55	130	208	342
			4	50	140	290	542
			5	60	160	330	650
			6	55	150	310	600
			7	50	140	300	550
			8	50	140	290	542
			10	60	160	330	650
			14	50	140	300	550
			20	40	100	230	450
		2	12	55	130	208	342
			15	55	130	208	342
			20	50	140	290	542
			25	60	160	330	650
			30	55	130	208	342
			35	60	160	330	650
			40	50	140	290	542
			50	60	160	330	650
			60	55	150	310	600
			70	60	160	330	650
			80	50	140	290	542
			100	60	160	330	650
			120	–	150	310	600
			140	–	140	300	550
			160	–	120	260	500
			200	–	100	230	450
最大输出力矩T_{2B}	Nm	1,2	3~200	3倍额定输出力矩			
额定输入转速n_1	rpm	1,2	3~200	5,000	4,000	4,000	3,000
最大输入转速n_{1B}	rpm	1,2	3~200	10,000	8,000	8,000	6,000
背隙	arcmin	1	3~20	≤13	≤13	≤13	≤13
		2	12~200	≤15	≤15	≤15	≤15
扭转刚性	Nm/arcmin	1,2	3~200	7	14	25	50
容许径向力F_{2rB}[2]	N	1,2	3~200	1,530	3,250	6,700	9,400
容许轴向力F_{2a1B}[2]	N	1,2	3~200	630	1,300	3,000	4,000
容许轴向力F_{2a2B}[2]	N	1,2	3~200	765	1,625	3,350	4,700
使用寿命	hr	1,2	3~200	20,000*			
效率 η	%	1	3~20	≤95%			
		2	12~200	≤92%			
重量	kg	1	3~20	2.1	6.4	13	24.5
		2	12~200	2.5	7.8	14.2	27.5
使用温度	℃	1,2	3~200	-10℃~+90℃			
润滑		1,2	3~200	合成润滑油脂			
防护等级		1,2	3~200	IP65			
安装方向		1,2	3~200	任意方向			
噪音值（n_1=3000rpm）	dB	1,2	3~200	≤63	≤65	≤68	≤70

减速机转动惯量

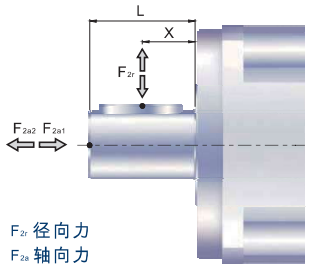
规 格		级 数	减速比[1]	FGR060 FGAR060	FGR080 FGAR080	FGR120 FGAR120	FGR160 FGAR160
转动惯量J_1	kg · cm²	1	3~7	0.35	2.25	6.84	23.4
			8~10	0.07	1.87	6.25	21.8
			14~20	0.07	1.87	6.25	21.8
		2	12~40	0.09	0.35	2.25	6.84
			50	0.09	0.31	1.87	6.25
			60	0.09	0.35	2.25	6.84
			70~100	0.09	0.31	1.87	6.25
			120~200	–	0.31	1.87	6.25

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。

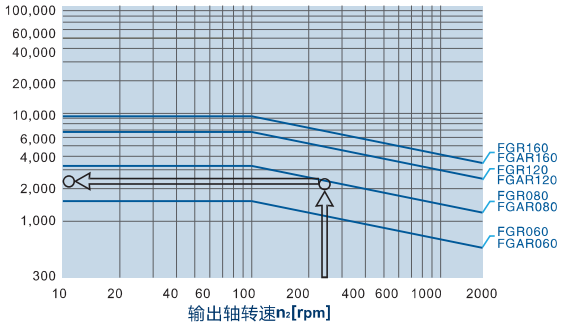
减速机输出轴之容许径向力及轴向力

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



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.

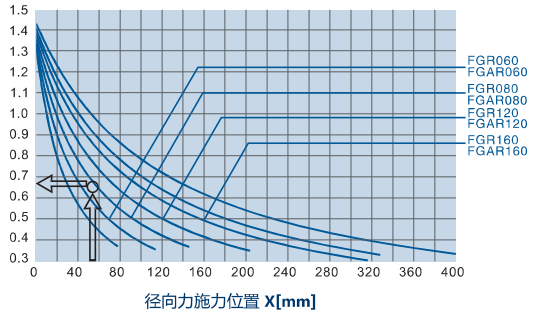
容许径向力 F_{2rB}[N] 施力于轴中心位置



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：

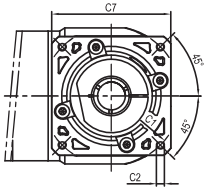
$F'_{2rB}=KbxF_{2rB}$
轴向力:
$F'_{2a1B}=0.2xF'_{2rB}$
$F'_{2a2B}=0.1xF'_{2rB}$

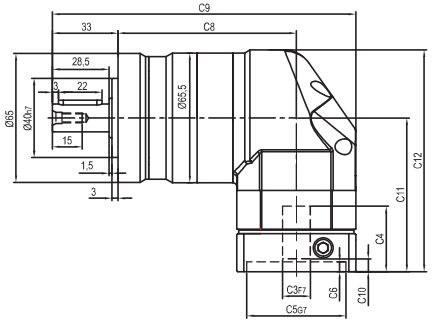
*连续运转降低使用寿命二分之一。

外形尺寸图表 / OUTLINE DIMENSION SHEET

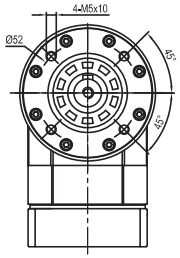
FGR-060D(M1)-L1

输入端/INPUT



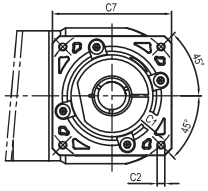


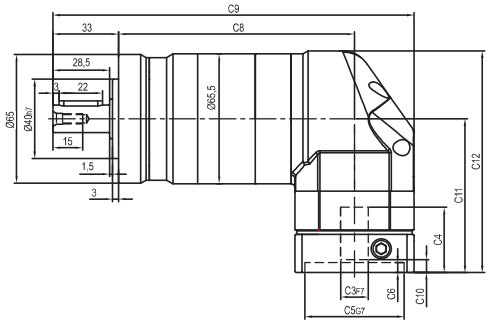
输出端/ OUTPUT



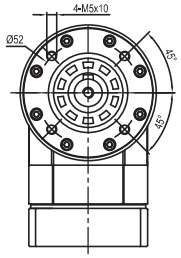
FGR-060D(M1)-L2

输入端/ INPUT





输出端 /OUTPUT



输出轴径/Output Diameter

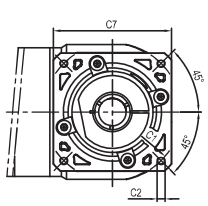
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGR-060D-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	90	153	5.5	77.5	111.75
FGR-060D-L2								119	182			
FGR-060D-L1	Ø70	4-M4x10,4-M5x12	Ø11, Ø14	33	Ø50	5	60	90	153	5.5	77.5	111.75
FGR-060D-L2								119	182			
FGR-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	90	163	12	87	121.25
FGR-060M1-L2								119	192			

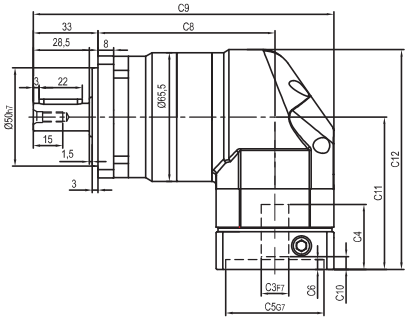
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

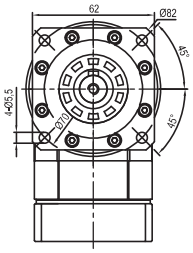
FGAR-060D(M1)-L1

输入端 / INPUT



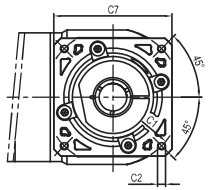


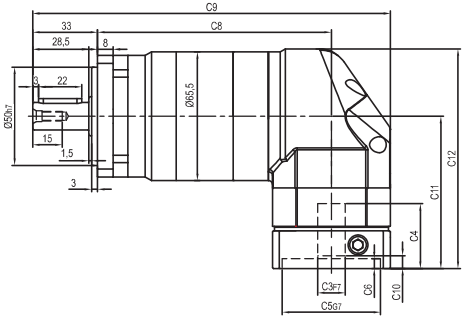
输出端 / OUTPUT



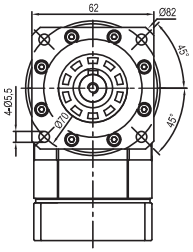
FGAR-060D(M1)-L2

输入端 / INPUT





输出端 / OUTPUT



输出轴径/Output Diameter

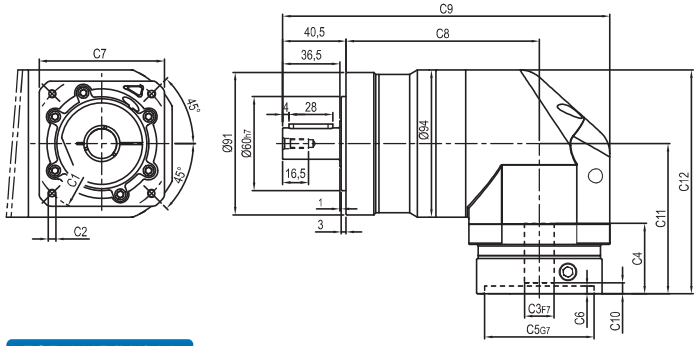
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGAR-060D-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	90	153	5.5	77.5	111.75
FGAR-060D-L2								119	182			
FGAR-060D-L1	Ø70	4-M4x10,4-M5x12	Ø11, Ø14	33	Ø50	5	60	90	153	5.5	77.5	111.75
FGAR-060D-L2								119	182			
FGAR-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	90	163	12	87	121.25
FGAR-060M1-L2								119	192			

* 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

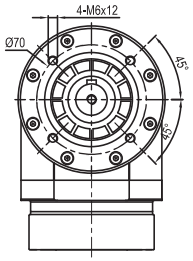
外形尺寸图表 / OUTLINE DIMENSION SHEET

FGR-080D(M1)-L1

输入端/INPUT

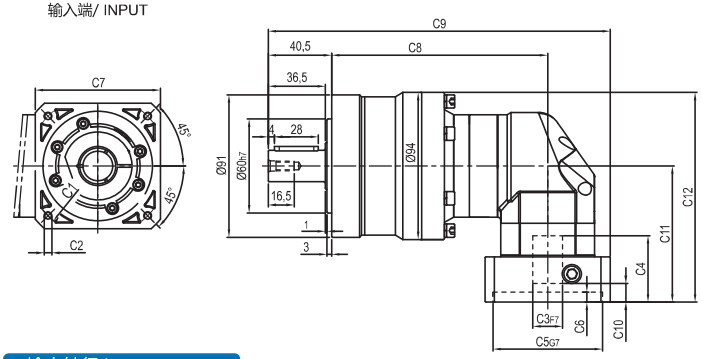


输出端/ OUTPUT

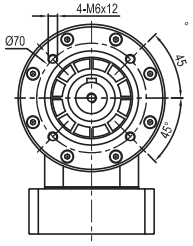


FGR-080D(M1)-L2

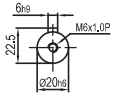
输入端/ INPUT



输出端 /OUTPUT



输出轴径/Output Diameter



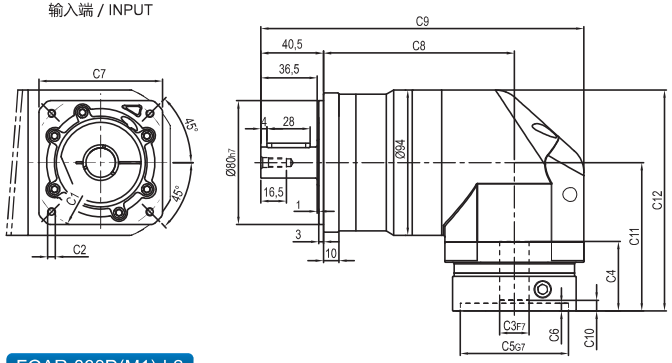
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGR-080D-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	123.5	209	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	123.5	209	6	96	143
FGR-080M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	123.5	214	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	123.5	229	19	120	167
FGR-080D-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	138	208.5	5.5	77.5	124.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	138	208.5	5.5	77.5	124.5
FGR-080M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	138	218.5	12	87	134
	Ø100	4-M6x14	Ø16	42.5	Ø80	6.5	86	138	221.5	11	87	134

* 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

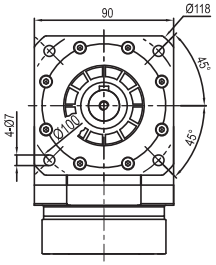
外形尺寸图表 / OUTLINE DIMENSION SHEET

FGAR-080D(M1)-L1

输入端 / INPUT

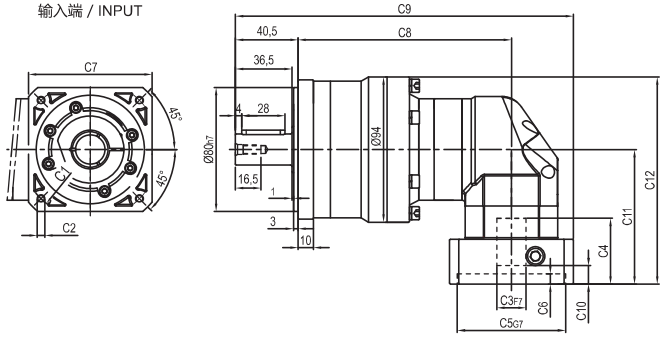


输出端 / OUTPUT



FGAR-080D(M1)-L2

输入端 / INPUT



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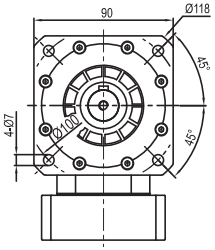
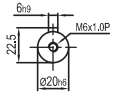


输出轴径/Output Diameter



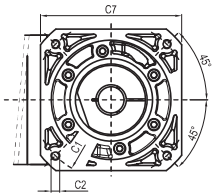
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGAR-080D-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	123.5	209	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	123.5	209	6	96	143
FGAR-080M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	123.5	214	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	123.5	229	19	120	167
FGAR-080D-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	138	208.5	5.5	77.5	124.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	138	208.5	5.5	77.5	124.5
FGAR-080M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	138	218.5	12	87	134
	Ø100	4-M6x14	Ø16	42.5	Ø80	6.5	86	138	221.5	11	87	134

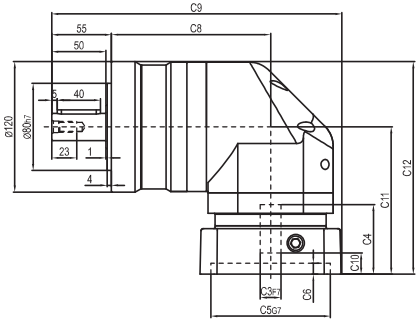
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

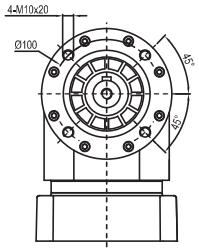
FGR-120D(M1)-L1

输入端/INPUT



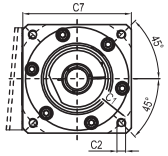


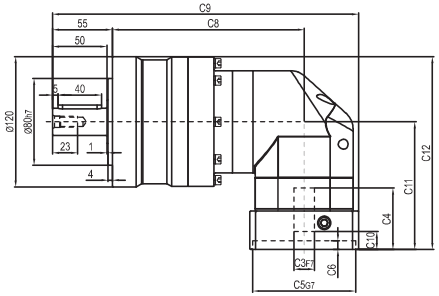
输出端/ OUTPUT



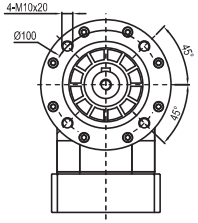
FGR-120D(M1)-L2

输入端/ INPUT

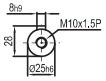




输出端 /OUTPUT



输出轴径/Output Diameter



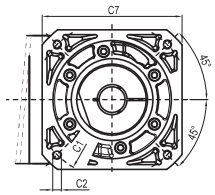
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGR-120D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	146.5	266.5	19.5	135.5	195.5
FGR-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	146.5	291.5	28	152.5	212.5
FGR-120D-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	176.5	276.5	7	96	156
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	176.5	276.5	6	96	156
FGR-120M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	176.5	281.5	16.5	117.5	177.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	176.5	296.5	19	120	180

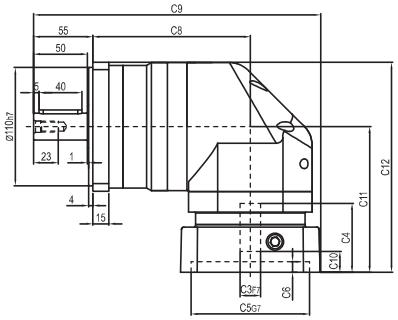
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

外形尺寸图表 / OUTLINE DIMENSION SHEET

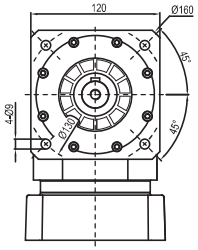
FGAR-120D(M1)-L1

输入端 / INPUT



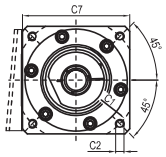


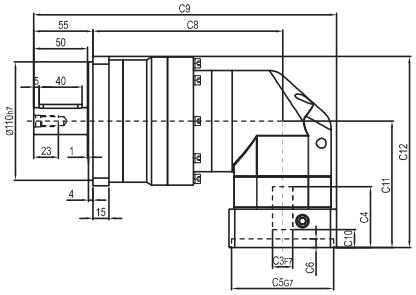
输出端 / OUTPUT



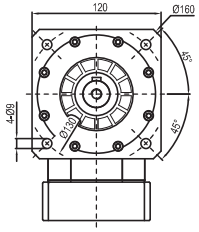
FGAR-120D(M1)-L2

输入端 / INPUT

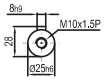




输出端 / OUTPUT



输出轴径/Output Diameter



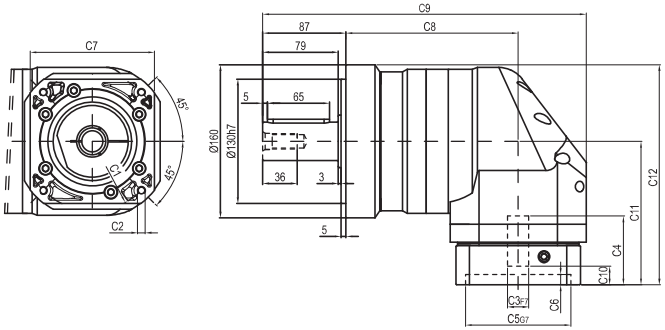
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGAR-120D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	146.5	266.5	19.5	135.5	195.5
FGAR-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	146.5	291.5	28	152.5	212.5
FGAR-120D-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	176.5	276.5	7	96	156
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	176.5	276.5	6	96	156
FGAR-120M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	176.5	281.5	16.5	117.5	177.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	176.5	296.5	19	120	180

* 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

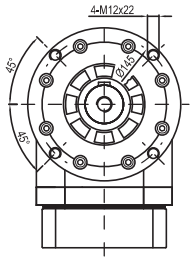
外形尺寸图表 / OUTLINE DIMENSION SHEET

FGR-160D(M1)-L1

输入端/INPUT

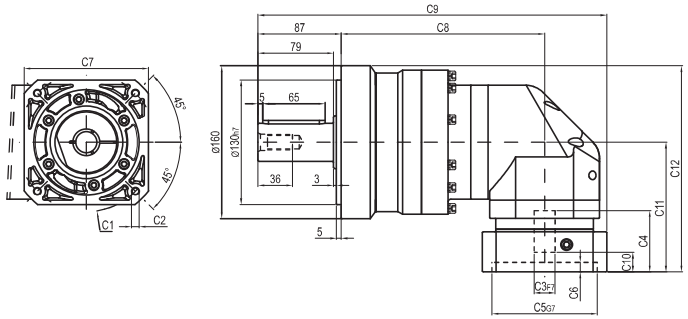


输出端/ OUTPUT

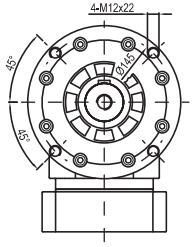


FGR-160D(M1)-L2

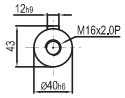
输入端/ INPUT



输出端 /OUTPUT



输出轴径/Output Diameter



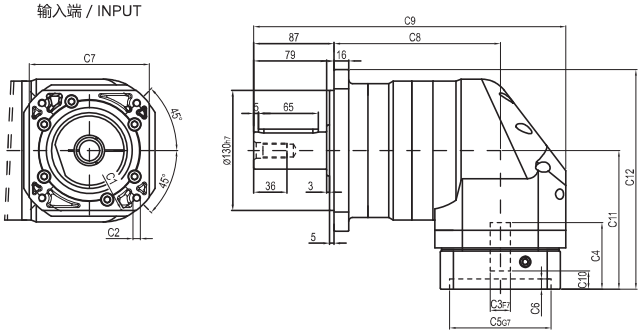
尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGR-160D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	180	338	19.5	150	230
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	180	357	25	160	240
FGR-160D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	212.5	364.5	19.5	135.5	215.5
FGR-160M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	212.5	389.5	28	152.5	232.5

* 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

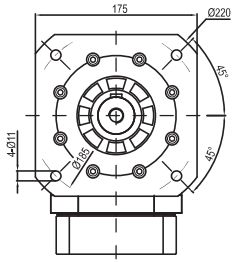
外形尺寸图表 / OUTLINE DIMENSION SHEET

FGAR-160D(M1)-L1

输入端 / INPUT

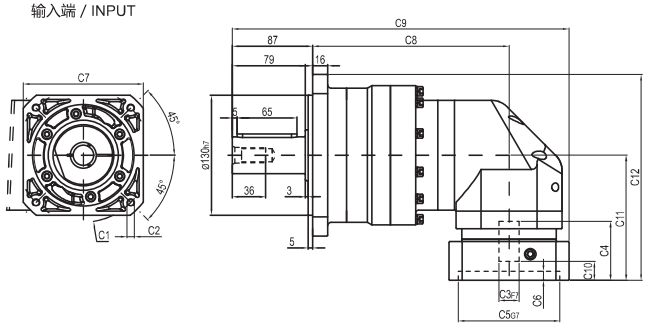


输出端 / OUTPUT

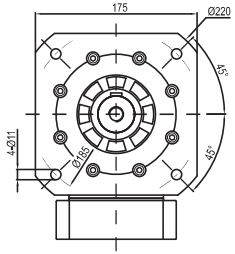


FGAR-160D(M1)-L2

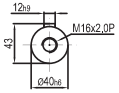
输入端 / INPUT



输出端 / OUTPUT



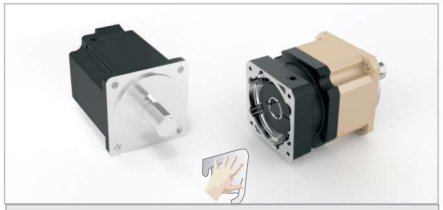
输出轴径/Output Diameter



尺寸	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGAR-160D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	180	338	19.5	150	237.5
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	180	357	25	160	247.5
FGAR-160D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	212.5	364.5	19.5	135.5	223
FGAR-160M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	212.5	389.5	28	152.5	240

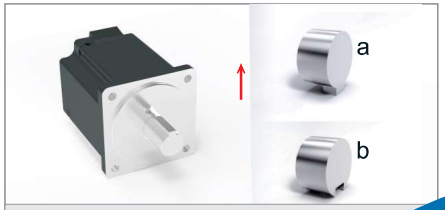
* C1~C7是公制标准马达连接板之尺寸,可根据客户要求单独定做。
* C1~C7are motor(metric standard) specific dimensions, which could be customised。
* D:常规孔,M1:极限孔
* D: Conventional Hole, M1: Limit Hole

FAB/FABR/FAD/FADR/FB/FBR/FE/FER/FG/FGA/FGR/FGAR系列
马达安装说明 / MOTOR INSTALLATION INSTRUCTIONS

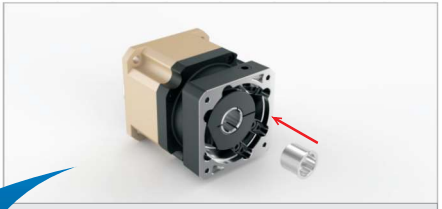


❶ 确认马达与减速机规格，并将马达及减速机之安装面擦拭干净。

❷ 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。



❸ 取下马达上原先之平键；
如有必要，请安装平衡键。

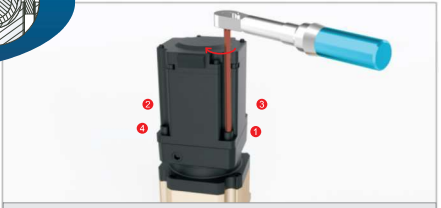


❹ 确认马达轴心尺寸，若有必要，装上轴套。

正确的锁固方式

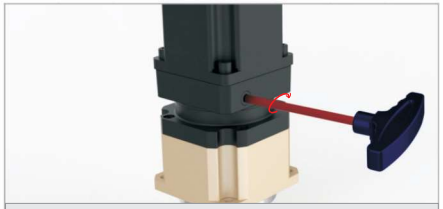
当马达为平轴状，对准入轴夹缝在平轴中心线，使锁紧毂螺丝与平轴呈垂直。

❺ 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的顺序，用扳手将附垫片之螺丝轻轻锁上。



❻ 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。

❼ 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。



❽ 锁回法兰侧孔堵头螺丝。

马达安装说明 / MOTOR INSTALLATION INSTRUCTIONS

表一　马达锁紧螺丝扭力建议表

螺丝尺寸	六角头尺寸	强度8.8螺丝之锁紧扭力		强度10.9螺丝之锁紧扭力		强度12.9螺丝之锁紧扭力	
	[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　马达锁紧螺丝扭力建议表

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