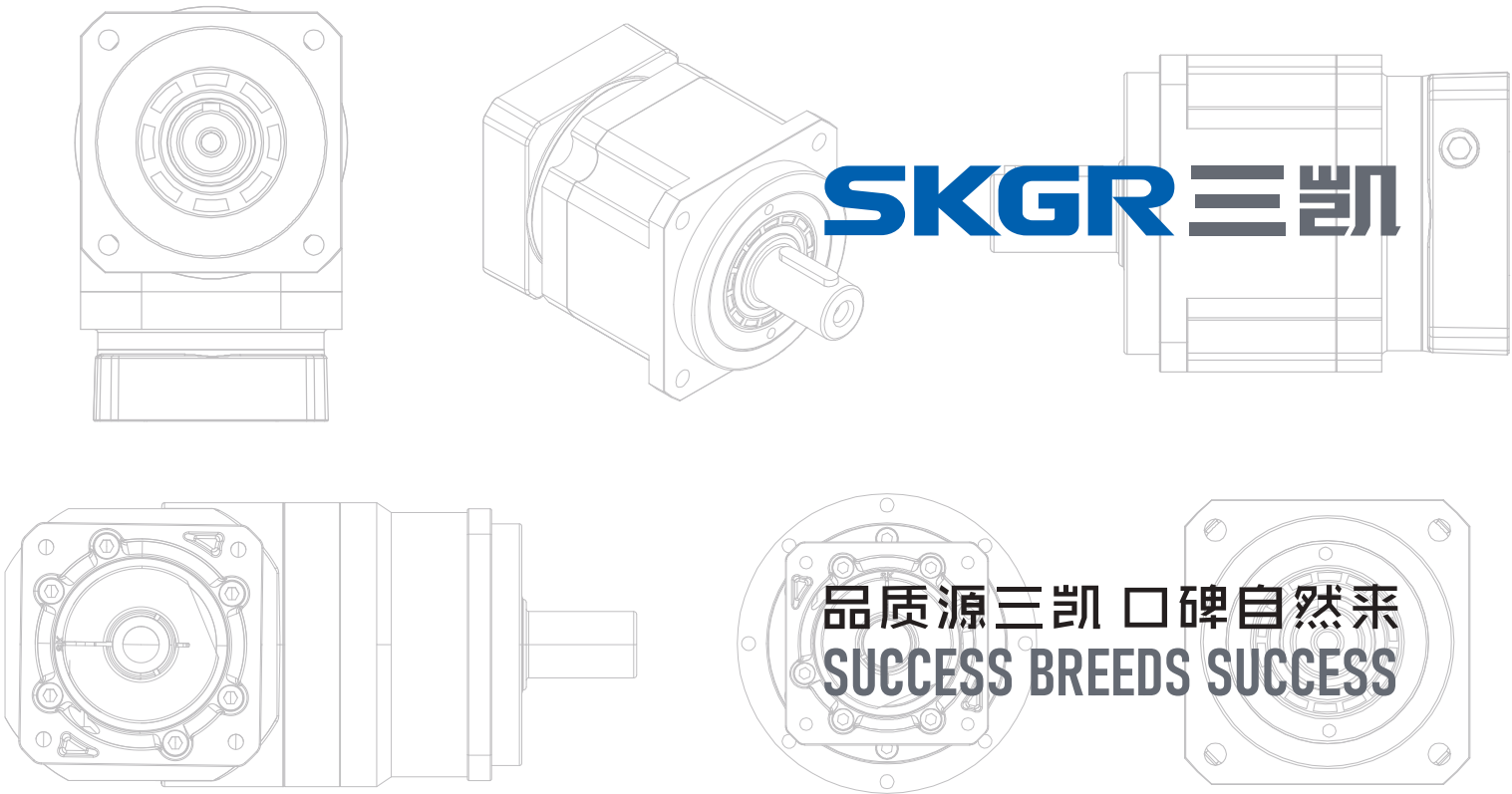


品质源三凯 口碑自然来
SUCCESS BREEDS SUCCESS

SKGR 三凯
精密行星

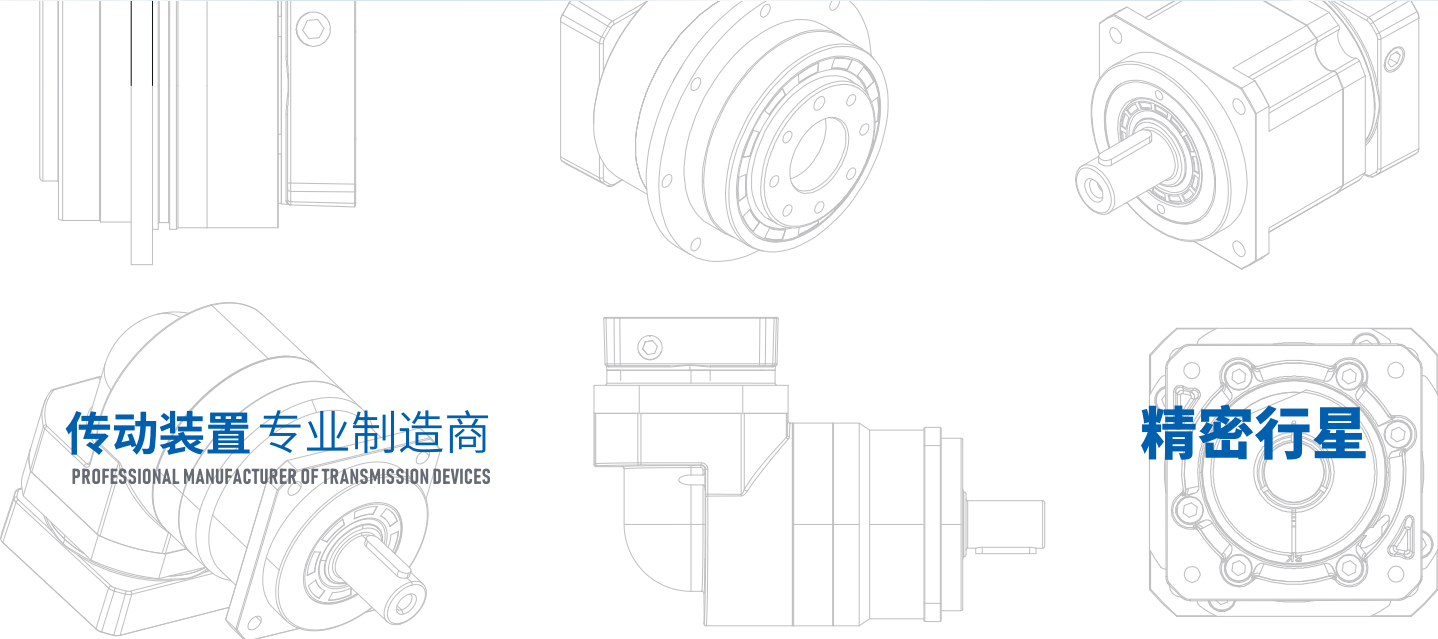


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ZHEJIANG SANKAI MECHANICAL AND ELECTRICAL CO., LTD

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WWW.ZJSKGR.COM
2025年7月版



传动装置专业制造商
PROFESSIONAL MANUFACTURER OF TRANSMISSION DEVICES

精密行星

随着传动技术的高速发展

全球范围内的传统传动设备发生了翻天覆地的重大变革

传动产品也迎来全新的机遇

特别是智能化技术的应用和普及也为其注入了新鲜的血液

使得整体行业的生命力更加旺盛

行星减速机正在转变

.....

三凯也在改变

.....

With the rapid development of transmission technology

Traditional transmission equipment has undergone a significant transformation worldwide

Transmission products also welcome new opportunities

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

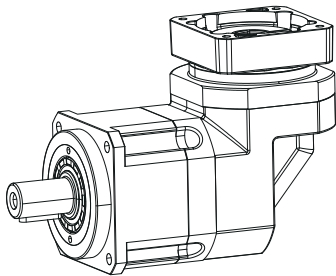
overall vitality of the industry even stronger

Planetary reducers are undergoing a transformation

.....

SKGR is also changing

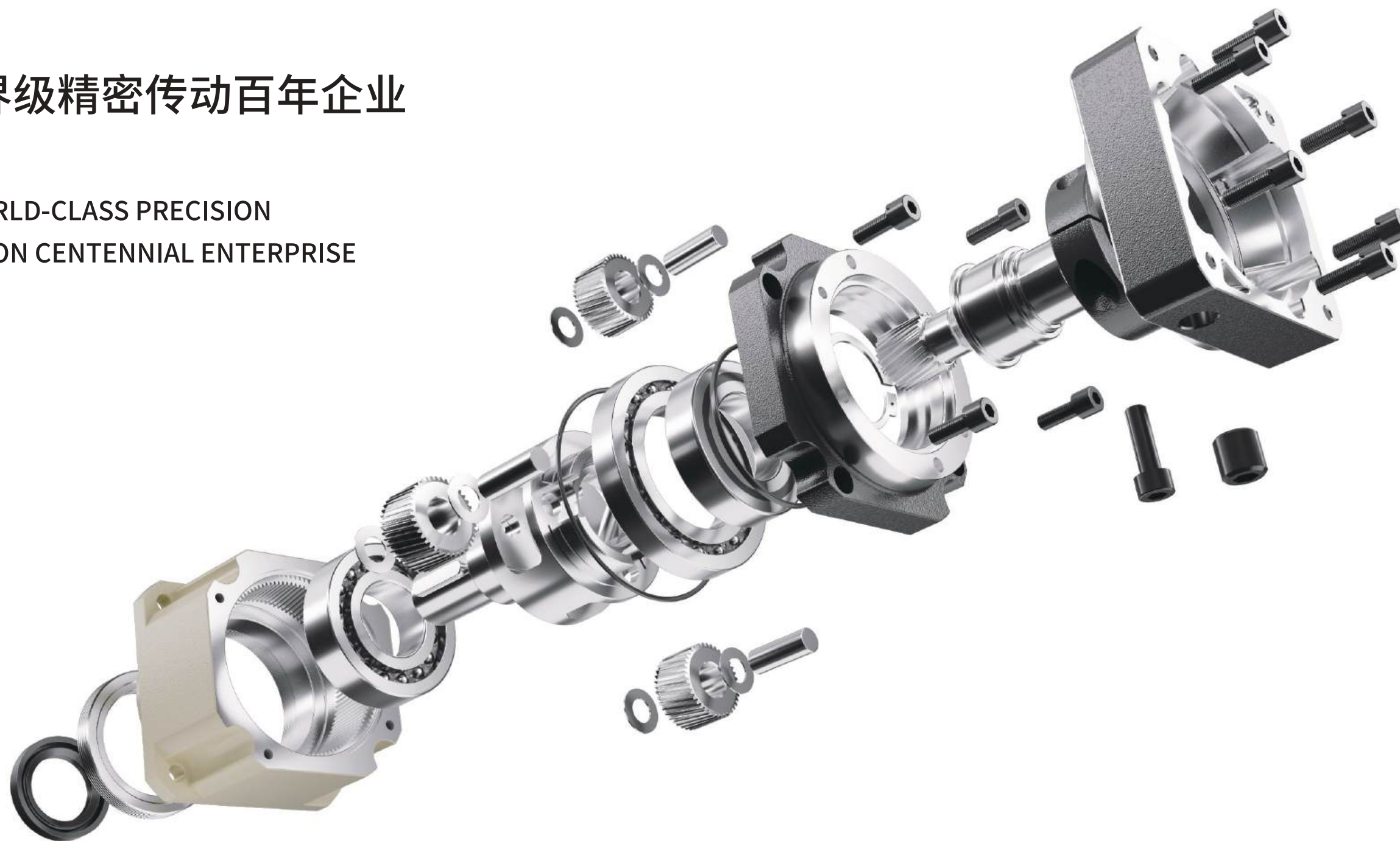
.....



愿景

成为世界级精密传动百年企业

BECOME WORLD-CLASS PRECISION
TRANSMISSION CENTENNIAL ENTERPRISE



企业介绍

COMPANY PROFILE



使命

MISSION 以技术为本, 弘扬工业精神

愿景

VISION 成为世界级精密传动百年企业

浙江三凯机电有限公司，传动行业知名创新企业。总部位于中国东南沿海浙江省台州市，是一家集科研、生产、销售于一体的动力传动装置研发制造商，在全国精密行星减速机行业细分领域排名前列。

三凯生产的减速机型号齐全，拥有精密行星减速机、工程行星减速机、谐波减速器、斜齿-准双曲面齿轮减速机、蜗轮蜗杆减速机、伺服电机、伺服驱动等产品。广泛服务于人形机器人、太阳能光伏、新能源动力、3C电子、钢铁冶金、智能物流、医疗设备、航空航天等行业领域。是美的库卡、西门子医疗、京东、大族激光等知名企业的终端供应商。

公司拥有浙江台州温岭两大制造基地（滨海、东部新区）、杭州销售及研发中心。拥有13项发明专利，33项实用新型专利，68项外观设计专利，以及ISO9001、ISO14001、ISO45001等体系认证。

相继荣获国家级专精特新“小巨人”企业、国家高新技术企业、国家知识产权优势企业、浙江省级企业技术中心、浙江省级高新技术企业研究院、浙江省隐形冠军培育企业、浙江省级制造精品企业、中国机械工业名牌产品等多项荣誉资信。

“三凯”品牌服务于五十多个行业，国内服务商500多家，出口东南亚、欧美等国家和地区。

三凯携手浙江工业大学等各类院校科研院所，深化产学研合作，实施智能制造及技术创新。作为中国通用机械协会减速机分会的重要成员企业、温岭市3项机床装备行业团体标准制定单位，三凯积极推动中国传动行业发展。“以技术为本，弘扬工业精神”为使命，秉承“诚信利他，进取敬畏，成就客户，同心同德，创新发展，追求卓越”的核心价值观，致力于开发生产高效、节能、环保型传动产品，为中国梦尽献三凯力量。

Zhejiang Sankai Mechanical and Electrical Co., Ltd is a well-known innovative enterprise in transmission industry. Headquartered in Taizhou City, Zhejiang Province, southeast coast of China, it is a R&D and manufacturer of power transmission devices integrating scientific research, production and sales, and ranks among the top in the national precision planetary gearbox industry segment.

SKGR produces a complete range of gear box models, including precision planetary gearbox, industrial planetary gearbox, harmonic reducer, helical-hypoid gearbox, worm gearbox, servo motor, servo drive and other products. It is widely used in humanoid robots, solar photovoltaics, new energy power, 3C electronics, iron and steel metallurgy, Intelligent logistics, medical equipment, aerospace and other industries. It is the terminal supplier of well-known enterprises such as Midea Kuka, Siemens Healthineers, JD.com, Han's Laser, etc.

The company has two major manufacturing bases in Wenling, Taizhou, Zhejiang Province (Binhai and Eastern New Area) and Hangzhou sales and R&D center. It has 13 invention patents, 33 utility model patents, 68 design patents, and ISO9001, ISO14001, ISO45001 and other system certifications. It has successively won many honorary credits such as national specialized and special new "little giant" enterprises, National High-tech Enterprises, National Intellectual Property Advantage Enterprises, Zhejiang provincial

enterprise technology centers, Zhejiang provincial high-tech enterprise research institutes, Zhejiang hidden champion cultivation enterprises, Zhejiang provincial manufacturing boutique enterprises, and famous brand products of China's machinery industry.

The "SKGR" brand serves more than 50 industries, with more than 500 domestic service providers, and is exported to Southeast Asia, Europe and the United States and other countries and regions.

SKGR has joined hands with Zhejiang University of Technology and other universities and research institutes to deepen industry-university-research cooperation and implement intelligent manufacturing and technological innovation. As an important member of the reducer branch of China General Machinery Association and the standard setting unit of three machine tool equipment industry groups in Wenling City, SKGR actively promotes the development of China's transmission industry. With the mission of "technology-oriented, carrying forward the industrial spirit" and adhering to the core values of "integrity and altruism, enterprising and awe-inspiring, customer achievement, one heart and one mind, innovation and development, and the pursuit of excellence", we are committed to developing and producing efficient, energy-saving and environmentally friendly transmission products, and contributing to the Chinese dream.



应用领域

APPLICATION
AREA

辐射多个行业，助力产业升级。

The vision radiates across multiple industries and assists in industrial upgrading.

帮助企业实现工业设备升级，
Assist enterprises in upgrading industrial equipment,

提高生产效率和产品质量。
improving production efficiency and product quality.



生产智造
PRODUCTION
INTELLIGENCE

把握每个环节,力求精进完善。
Grasp Each Link And Strive For Refinement And Improvement.

严格把控原料采购，
Strictly control the procurement of raw materials,

精细管理生产流程，
Fine management of production processes,

确保产品质量安全。
Ensure product quality and safety.



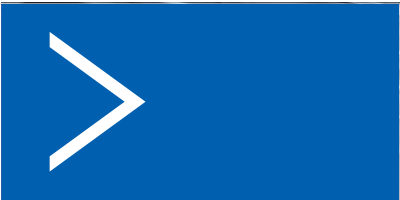
精密检测
PRECISION
TESTING

把关每个细节, 品质源于严格。
Check Every Detail, Quality Comes From Strictness.

对产品严格质量控制、
Strict quality control of products、

高标准要求,
High standard requirements,

为客户提供安全可靠的优质产品。
Provide customers with safe and reliable high-quality products.



客户服务

CUSTOMER SERVICE

提供专业、周到的，
Provide professional、considerate,

售前、售中、售后服务，
Pre-sales、in sales、and after-sales service,

为客户创造价值。
Create value for customers.



服务每个客户，真诚收获信任。
Serve Every Customer And Sincerely Gain Trust.

三凯传动，驱动未来。

SKGR TRANSMISSION, DRIVING THE FUTURE.

随着传动技术的持续发展和进步，
高效、环保和智能已成为工业设备升级换代的核心趋势。
未来，传动技术将驱动智能制造，推动人类文明迈向新的高度。

With the continuous development and progress of transmission technology,
Efficiency, environmental protection, and intelligence have become the core trends in the
upgrading and upgrading of industrial equipment.
In the future, transmission technology will drive intelligent manufacturing and push human
civilization to new heights.

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产品简介 / product introduction

FAB Series



可选尺寸 Avai lable size		042/060/090/090A/115 115A/142/142A/180/220
额定输出力矩 Rated output torque		14Nm—2000Nm
减速比 Ratio	单级 Single stage	3/4/5/6/7/8/10
	双级 Dual stages	12/15/20/25/30/35 40/50/60/70/80/100
背 隙 Backlash	单级 Single stage	≤1,≤3,≤5 arcmin
	双级 Dual stages	≤3,≤5,≤7 arcmin

FABR Series



可选尺寸 Avai lable size		042/060/090/009A/115 115A/142/142A180/220
额定输出力矩 Rated output torque		14Nm—2000Nm
减速比 Ratio	单级 Single stage	3/4/5/6/7/8/10/14/20
	双级 Dual stages	12/15/20/25/30/35/40/50/60 70/80/100/120/140/160/200
背 隙 Backlash	单级 Single stage	≤2,≤4,≤6 arcmin
	双级 Dual stages	≤4,≤7,≤9 arcmin

FAD Series



可选尺寸 Avai lable size		047/064/090/090A/110 100A/140/140A/200/255
额定输出力矩 Rated output torque		14Nm—2000Nm
减速比 Ratio	单级 Single stage	4/5/6/7/8/10
	双级 Dual stages	20/25/35/40/50/60 70/80/100
背 隙 Backlash	单级 Single stage	≤1,≤3,≤5 arcmin
	双级 Dual stages	≤3,≤5,≤7 arcmin

FADR Series



可选尺寸 Avai lable size		047/064/090/090A/110 100A/140/140A/200/255
额定输出力矩 Rated output torque		14Nm—2000Nm
减速比 Ratio	单级 Single stage	4/5/6/7/8/10/14/20
	双级 Dual stages	20/25/35/40/50/60/70 80/100/120/140/160/200
背 隙 Backlash	单级 Single stage	≤2,≤4,≤6 arcmin
	双级 Dual stages	≤4,≤7,≤9 arcmin

FB Series



可选尺寸 Avai lable size		042/060/090/090A/115 115A/142/142A/180/220
额定输出力矩 Rated output torque		14Nm— 2000Nm
减速比 Ratio	单级 Single stage	3/4/5/6/7/8/10
	双级 Dual stages	12/15/20/25/30/35 40/50/60/70/80/100
背 隙 Backlash	单级 Single stage	≤5 arcmin
	双级 Dual stages	≤7 arcmin

FBR Series



可选尺寸 Avai lable size		042/060/090/090A/115 115A/142/142A/180/220
额定输出力矩 Rated output torque		40Nm-650Nm
减速比 Ratio	单级 Single stage	3/4/5/6/7/8/10/14/20
	双级 Dual stages	12/15/20/25/30/35/40/50/60 70/80/100/120/140/160/200
背 隙 Backlash	单级 Single stage	10arcmin
	双级 Dual stages	12arcmin

FE Series



可选尺寸 Avai lable size		070/090/090A/120 120A/155/155A/205/235
额定输出力矩 Rated output torque		40Nm—2000Nm
减速比 Ratio	单级 Single stage	3/4/5/6/7/8/10
	双级 Dual stages	12/15/20/25/30/35 40/50/60/70/80/100
背 隙 Backlash	单级 Single stage	≤5 arcmin
	双级 Dual stages	≤7 arcmin

FER Series



可选尺寸 Avai lable size		070/090/090A/120 120A/155/155A/205/235
额定输出力矩 Rated output torque		40Nm-650Nm
减速比 Ratio	单级 Single stage	3/4/5/6/7/8/10/14/20
	双级 Dual stages	12/15/20/25/30/35/40/50/60 70/80/100/120/140/160/200
背 隙 Backlash	单级 Single stage	10arcmin
	双级 Dual stages	12 arcmin

产品简介 / product introduction

FG Series



可选尺寸 Avai lable size		040/060/080/080A 120/120A/160/160A
额定输出力矩 Rated output torque		14Nm—650Nm
减速比 Ratio	单级 Single stage	3/4/5/6/7/8/10
	双级 Dual stages	12/15/20/25/30 35/40/50/60/70/80/100
背 隙 Backlash	单级 Single stage	≤8 arcmin
	双级 Dual stages	≤10 arcmin

FGR Series



可选尺寸 Avai lable size		060/080/080A/120 120A/160/160A
额定输出力矩 Rated output torque		40Nm-650Nm
减速比 Ratio	单级 Single stage	3/4/5/6/7/8/10/14/20
	双级 Dual stages	12/15/20/25/30/35 40/50/60/70/80/100 120/140/160/200
背 隙 Backlash	单级 Single stage	13 arcmin
	双级 Dual stages	15 arcmin

FGA Series



可选尺寸 Avai lable size		040/060/080/080A 120/120A/160/160A
额定输出力矩 Rated output torque		40Nm-650Nm
减速比 Ratio	单级 Single stage	3/4/5/6/7/8/10
	双级 Dual stages	12/15/20/25/30 35/40/50/60/70/80/100
背 隙 Backlash	单级 Single stage	≤8 arcmin
	双级 Dual stages	≤10 arcmin

FGAR Series



可选尺寸 Avai lable size		060/080/080A/120 120A/160/160A
额定输出力矩 Rated output torque		40Nm-650Nm
减速比 Ratio	单级 Single stage	3/4/5/6/7/8/10/14/20
	双级 Dual stages	12/15/20/25/30/35 40/50/60/70/80/100 120/140/160/200
背 隙 Backlash	单级 Single stage	13 arcmin
	双级 Dual stages	15 arcmin

FAF Series



可选尺寸 Avai lable size		060/075/075A/100 100A/140/140A/180
额定输出力矩 Rated output torque		14Nm—2000Nm
减速比 Ratio	单级 Single stage	3/4/5/6/7/8/10
	双级 Dual stages	12/15/20/25/30/35 40/50/60/70/80/100
背 隙 Backlash	单级 Single stage	≤1,≤3,≤5 arcmin
	双级 Dual stages	≤3,≤5,≤7 arcmin

FAFR Series



可选尺寸 Avai lable size		060/075/075A/100 100A/140/140A/180
额定输出力矩 Rated output torque		14Nm—2000Nm
减速比 Ratio	单级 Single stage	3/4/5/6/7/8/10/14/20
	双级 Dual stages	12/15/20/25/30/35/40/50/60 70/80/100/120/140/160/200
背 隙 Backlash	单级 Single stage	≤2,≤4,≤6 arcmin
	双级 Dual stages	≤4,≤7,≤9 arcmin

FAT Series



可选尺寸 Avai lable size		065/075/090 110/170/210
额定输出力矩 Rated output torque		12Nm-1020Nm
减速比 Ratio	双级 Dual stages	4/5/6/7/8/10/15/20
	三级 Three stages	25/30/35/40/50 75/100/120/150/200
	单级 Single stage	≤6 arcmin
背 隙 Backlash	双级 Dual stages	≤10 arcmin
	三级 Three stages	≤12 arcmin
	单级 Single stage	≤10 arcmin

产品特性 / products features



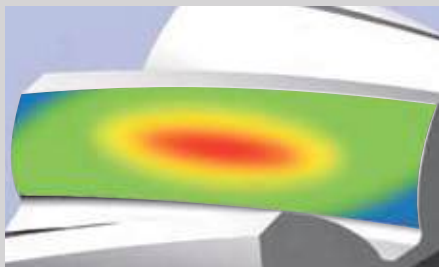
行星齿轮的传动介面采用**不含保持架之满滚针设计**，增加接触面积以提高结构刚性及输出扭矩。



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过平衡分析**，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。

产品特性 / products features



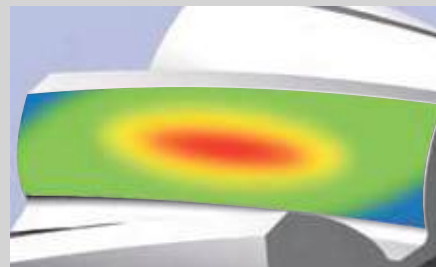
The transmission interface of the planetary gear adopts full needle rolling design without cage, increasing the contact area to improve the structural rigidity and output torque.



The gearbox mechanism adopts a helical gear design, and its tooth meshing rate is more than twice that of ordinary spur gears. It features with smooth operation, low noise, high output torque and low backlash.



The connection between the input shaft and the motor adopts a collet-type locking mechanism and dynamic balance analysis to ensure the concentricity of the interface and power transmission with zero-backlash at high input speeds.



The finite element analysis of gear strength is carried out by ANSYS technology, and the shape and lead of the tooth surface are modified to reduce the impact and noise of gear meshing and increase the service life of the gear system.



The gear material is made of high-quality alloy steel and treated with carbon and ammonia co-infiltration to obtain the best gear resistance and toughness.



The planetary frame and output shaft are designed with an integrated double support structure to ensure maximum torsional rigidity.



The sun gear and input shaft are integrated to ensure maximum torsional rigidity and zero backlash power transmission at high input speeds.

产品概述 / product overview

产品特点/Product feature

精密行星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 gearbox is a new-generation of product developed by SKGR, with a compromise of advanced technology both at home and abroad, its main features are as follows:

- 1.Low Noise: Under 65db.
- 2.Low Backlash: Single-stage≤1 arcmin; Dual-stage≤3 arcmin.
- 3.High Efficiency: Single-stage≥95%; Dual-stage≥92%.
- 4.High Input Speed: Up to 8000 RPM.
- 5.High Torque: High output torque density.
- 6.High Stability: Employs high tensile strength alloy steel.Gear hardening is made for the entire gear instead of only surface hardening,which extends gear service life and maintain high accuracy as new after a long period ofoperation.
- 7.High Speed Reduction Ratio:The gear reducer is a modular design. The planetary gear box can be connected. Speed reduction ratio is over 1:1000.

产品用途/Precision usage

精密行星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 gearbox is widely used in the following industries:

- 1. Aerospace, military industry.
- 2. Medical health, electronic information industry.
- 3. Industrial robots, production automation,CNC manufacturing industry.
- 4. Motor, textile, printing, food, metallurgy, environmental engineering, warehouse logistics industry.

选型说明 / selection guide

行星减速机的选型 /Planetary gearbox 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。

The selection of planetary gearbox should follow the principle of combining applicability and economy, that is, the technical indicators of the planetary gearbox can not only meet the requirements of the equipment but also save costs. "Passing" and "failing" will bring waste of costs. Improper selection is the main reason for the failure of the gearbox, so it is very important to choose the planetary gearbox correctly.

The selection of gearbox should consider its internal performance indicators such as structural type, bearing capacity, reduction ratio, output speed, axial force, radial force, torsional rigidity, backlash, etc., and should also fully consider external factors such as installation form, working conditions, and working environment. For your convenience, please refer to the following steps to achieve accurate and fast selection.

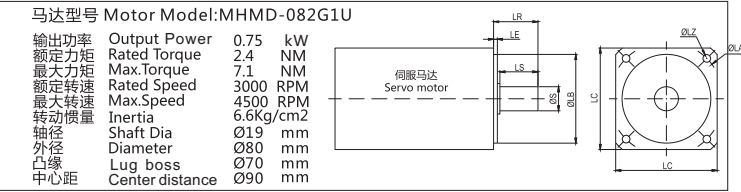
Step1：减速机规格的确定 /Determination of gearbox specifications

步骤 Step	说明 Instruction	代号 Code	参数计算 Parameter calculation						
1	设备使用系数 Service factor of the equipment	f ₁	负载类型 Loading classification	每小时启动次数Z Running per hour Z	使用系数fs Using fs				
					每日运行时间（h）Running per day(h)				
					h < 4	4 < h < 8	8 < h < 12	12 < h < 16	16 < h < 24
			均匀负载 Uniform	Z < 10	0.85	0.95	1.00	1.20	1.60
				10 < Z < 30	0.90	1.10	1.15	1.40	1.80
				30 < Z < 100	1.00	1.20	1.30	1.60	2.00
			中等冲击负载 Medium shock	Z < 10	1.00	1.20	1.30	1.60	2.00
				10 < Z < 30	1.10	1.35	1.45	1.80	2.20
				30 < Z < 100	1.20	1.45	1.60	2.00	2.40
重冲击负载 Heavy shock	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 Determination of torque	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} ×f _s （T _{C2} -计算扭矩 T _{r2} -实际所需扭矩f _s -使用系数） T _{2N} >T _{C2} （Rated torque of selected gearbox T _{2N} > Calculated torque T _{C2} ） T _{C2} =T _{r2} ×f _s （T _{C2} - Calculated torque, T _{r2} - Actual required torque, f _s - Service factor）						
3	额定输入转速 Rated input speed	n ₁	允许最大输出转速请参考减速机性能资料 Please refer to the performance data of the gearbox for the maximum allowable output speed.						
4	确定减速比 Determine the ratio	i	i=n ₁ /n ₂						
5	减速机效率 Efficiency of the gearbox	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 The input power of the gearbox is calculated based on the torqueor power required by the driven equipment	P ₁	P ₁ =（T ₂ ×n ₁ ）/（9550×i×η） 或 P ₁ =P ₂ ÷η						
7	根据计算传动力表确定减速机的规格 The specifications of the gearbox are determined according to the calculated transmission torque	T _{2N} 、P _{1N}	T _{2N} ≥T ₃ ×f ₁ ×f ₂ P _{1N} ≥P ₁ ×f ₁ ×f ₂						
8	输出轴径向力、轴向力校核 Output shaft radial force and axial force check	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。频繁启动-停止运转工况应选择加强型 Check the performance data table in the product manual. The comparison should be less than the maximum radial force and axial force of the gearbox. For frequent start-stop operation, the enhanced type should be selected.						
9	确认使用环境 Confirm the application environment		防护等级、工作温度、化学环境等 Protection level, operating temperature, chemical environment, etc						
10	根据空间确认安装方式 Check the installation method according to the space		同轴安装、90°直角安装 Inline type or with right angle type						
11	确认减速机型号 Confirm the model of the gearbox		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 According to the performance data sheet, input and output mode, etc., determine the specific series, model, specification and accessories						

说明：n₁、P₂为被驱动设备的转速和功率；P₁=P₂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。

Instruction: n₂、P₂ is the ratio and power for equipment which has been driven；P₁=P₂ is the needed power and torque for equipment which has been driven；P_{1N}、T_{2N} is the actual needed power and torque which has been driven.

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
Determine the motor, motor manufacturer, specification model, performance and external dimension.

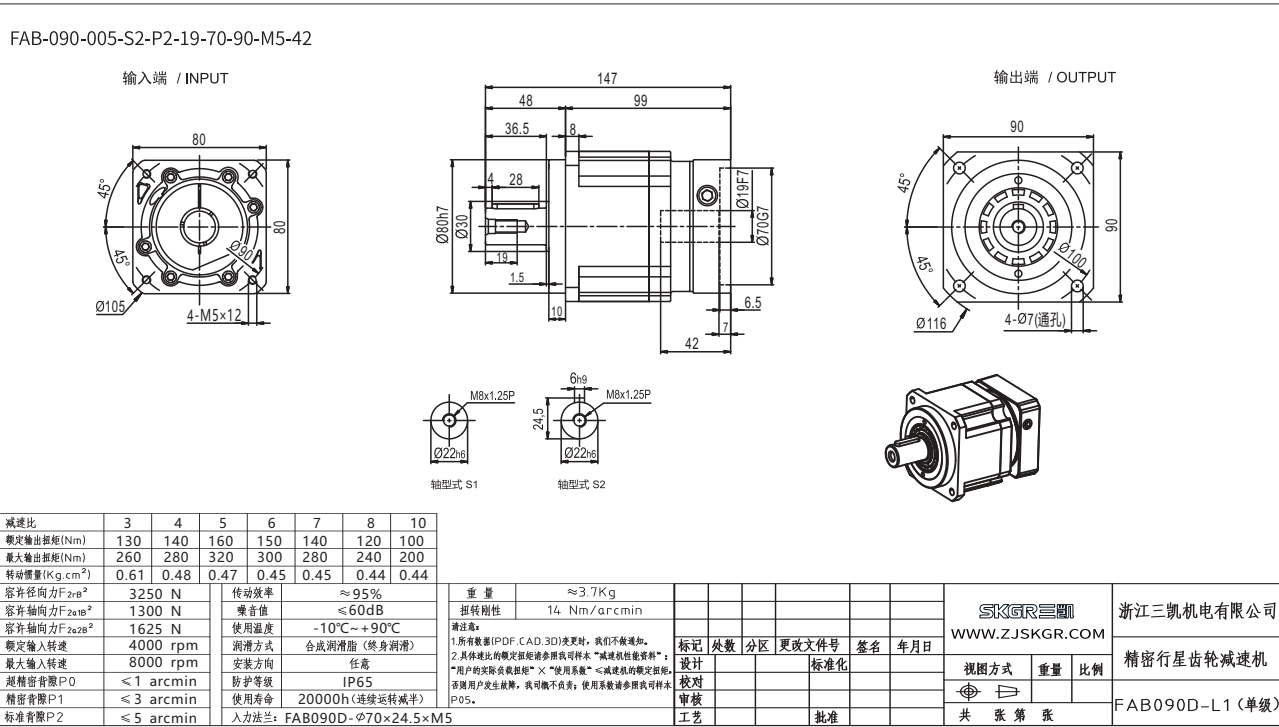


订货须知 Notice for ordering

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

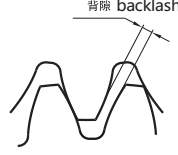
Step3:确定所订行星减速机规格型号及工厂给出的CAD或PDF图纸，正确书写型号 例如：FAB-090-005-S2-P2-19-70-90-M5-42

Determine the specifications and models of the planetary gearbox and the CAD and PDF drawings given by the factory, and write the model correctly, for example:FAB-090-005-S2-P2-19-70-90-M5-42



选型说明 / selection guide

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

减速比Ratio	输出转速比上输入转速 Input speed/Output speed
额定输入转速 n ₁ [rpm] Rated input speed	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，本书中的额定输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 The driving speed of the gearbox, if the gearbox is directly connected to the motor, the speed value is the same as the motor speed, the rated input speed in this book is measured under the condition that the ambient temperature is 20 °C, please reduce the speed n ₁ when the ambient temperature is higher.
输出转速 n ₂ [rpm] Output speed	输出转速按照下列公式通过输入转速n ₁ 和传动比i计算出来：n ₂ =n ₁ /i The output speed is calculated by the following formula from the input speed n ₁ and the gear ratio i: n ₂ =n ₁ /i
段/级数 Stages	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需求，也就是说，减速比越大，级数越多。由于增加了行星齿轮的数量，所以二级或三集减速机的长度会有所增加，效率会有所下降。 Number of sets of planetary gears. Since one set of planetary gears cannot meet the larger transmission ratio, sometimes two or three sets are needed to meet the user's demand for a larger transmission ratio, that is, the larger the reduction ratio, the more stages. Due to the increase in the number of planetary gears, the length of the two- or three-stage gearbox will increase and the efficiency will decrease.
传动效率 Efficiency	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。 Refers to the transmission efficiency of the gearbox under the condition of rated load. The larger the reduction ratio, the more stages, and the lower the efficiency.
平均寿命 Average lifetime	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。 It refers to the gearbox under the rated load, and the rated input speed is the continuous working time of the gearbox.
定位精度 Precise positioning	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。 The key to achieving precise positioning in high-speed mechanical reciprocating motion is to minimize the angular deviation caused by the movement. Positioning accuracy depends on two values, one is the loading related deflection angle, which involves the return clearance and torsional stiffness; The other is the deflection angle related to motion control, which involves the problem of synchronization deviation.
回程间隙背隙 Backlash	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，然后在输出装用力矩仪加载一定力矩（2％T _{2N} ），以克服减速机内的摩擦力。 The maximum deviation angle between the output shaft of the gearbox and the input shaft is fixed when measuring, and then a certain torque (2%T _{2N}) is loaded with a torque meter in the output device to overcome the friction force in the gearbox.
迟滞曲线 Hysteresis curve	 迟滞曲线是为了得出减速机的扭转刚度，通过检测得到迟滞曲线。检测时，先将减速机输入端固定住，然后在输出端的两个旋转方向分别持续地加载到T _{2B} 最大输出力矩，继而逐步卸载，用仪器记录下力矩的仿差角，得到的曲线是一条闭合曲线，从中可以计算出减速机回程间隙(j _t)和扭转刚度(C _{t21})。 The hysteresis curve is to obtain the torsional stiffness of the gearbox, and the hysteresis curve is obtained by detection. During the detection, the input end of the gearbox is fixed first, and then the maximum output torque of T _{2B} is continuously loaded in the two rotation directions of the output end, and then gradually unloaded, and the aberration angle of the torque is recorded by the instrument, and the curve obtained is a closed curve, from which the return clearance (j _t) and torsional stiffness (C _{t21}) of the gearbox can be calculated.

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转动惯性 Inertia	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 values in this catalogue refer to the input terminals. A value that represents the feature of an object's efforts to keep itself in a state of rotation (or stationary or rotation).								
惯量比 The proportion of inertia	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 。 It refers to the ratio between the load inertia and the inertia of the transmission system(motor plus gearbox). This ratio determines the controllability of the system. The larger theλvalue, that is, the greater the difference between the moment of inertia, the more difficult it is to accurately control the highly dynamic action process, so it is recommended to control the λvalue at <5 as much as possible. The gearbox can reduce the load inertia by 1/i ² .								
噪音 Noise	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。 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.								
工作条件 Operating conditions	<table><tr><td>工作温度 /Operating temp</td><td>-10℃~+90℃</td></tr><tr><td>防护等级 /Degree of protection</td><td>IP54/IP65</td></tr><tr><td>润滑 /Lubrication</td><td>长效润滑，整个试用期内无需添加润滑剂/Life time lubrication</td></tr><tr><td>安装方式 /Mounting position</td><td>任意/Any</td></tr></table>	工作温度 /Operating temp	-10℃~+90℃	防护等级 /Degree of protection	IP54/IP65	润滑 /Lubrication	长效润滑，整个试用期内无需添加润滑剂/Life time lubrication	安装方式 /Mounting position	任意/Any
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安装方式 /Mounting position	任意/Any								
额定输出扭矩 T _{2N} [Nm] Rated output torque	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。 The torque (no wear) that can be loaded on the gearbox for a long time (continuous duty system), the conditions should meet the uniform load, the safety factor S=1, the following specifications of FG160/FAB142, and the theoretical life is 20,000 hours: The theoretical life of FAB180 and above is 10,000 hours: the T _N value complies with the ISODP6336 gear standard and ISO281 bearing standard.								
加速扭矩 [Nm] Acceleration torque	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。 Refers to the maximum torque allowed to be loaded to the output in a short time when the duty cycle is less than 1000 times per hour. When the duty cycle is more than 1000 times per hour, the impact factor must be considered. The acceleration torque is a maximum value in the selection of the cyclic working system, and the acceleration torque in actual use must be less than T _{2B} , otherwise the life of the gearbox will be shortened.								
紧急制动扭矩 [Nm] Emergency braking torque	指减速机输出端所能加载的最大力矩，这个力矩可在减速机寿命期内加载1000次，绝对不能超过1000次。（备注：FG160/FAB142以下机型为T _{2HOT} =2•T _{2B} FAB180以上机型为T _{2HOT} =1.5•T _{2B} ） It refers to the maximum torque that can be loaded at the output end of the gearbox, which can be loaded 1000 times during the life of the reducer, and must not exceed 1000 times. (Note: The following specifications of FG160/FAB142 are.T _{2HOT} =2•T _{2B} , FAB180 and above: T _{2HOT} =1.5•T _{2B})								
空载扭矩 T ₀₁₂ [Nm] No-load torque	指加载到减速机上的以克服减速机内摩擦力的力矩。 Refers to the moment loaded onto the gearbox to overcome the friction in the gearbox.								
最大输出扭矩 T _{2B} Maximum output torque	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。 Rit refers to the output torque that the gearbox can withstand under static conditions or frequent start-up conditions, usually referring to peak load or starting load.								
实际所需扭矩 T ₂ [Nm] Actual torque required	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。 The required torque depends on the actual working conditions of the application, and the rated torque T _{2N} of the proposed gearbox must be greater than this torque.								
计算用扭矩 T _{c2} [Nm] Torque for calculation	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 ≤T _N It will be used in the selection of the gearbox, which can be obtained from the actual required torque T ₂ and the coefficient f _s , according to the following formula: T _{c2} =T ₂ *f _s ≤T _N								

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侧倾扭矩 [Nm] Roll torque	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 Refers to the moment of axial and radial force acting on the radial force point on the bearing at the output end. It is calculated as follows: M _{2kmax} =[Fa*y ₂ +Fr*(X ₂ +Z ₂)]/1000
轴向力 Fa[N] Axial force	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。 It refers to a force parallel to the axis, and when its application point has a certain axial deviation (Y ₂) from the output shaft end, an additional bending moment will be formed, and when the axial force exceeds the rated value shown in the catalog, this bending force must be offset by a coupling.
径向力 Fr[N] Radial force	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。 Refers to a force acting perpendicular to an axial force, which is parallel to the output shaft, and its point of action is at an axial distance (X ₂) from the shaft end. This point becomes a lever point, and the transverse force forms a bending moment.
轴伸径向载荷、 轴向载荷 Axial extension radial load, axial load	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。 The additional basis for the selection of the gearbox is the radial load and the axial load on the protruding end of the output shaft. The strength of the shaft and the load-bearing capacity determine the radial load of the allowable shaft extension. The maximum permissible value given in the product catalogue refers to the force acting at the midpoint of the shaft extension (i.e. at 1/2L) in the most unfavorable direction. When the force is not at the midpoint, the closer to the shoulder is, the greater the allowable radial load; Conversely, the farther the application point is from the shoulder, the less radial load is allowed.
安全系数 S Safety factor	安全系数等于减速机的额定输入功率与电机功率的比值。 The safety factor is equal to the ratio of the rated input power of the gearbox to the power of the motor.
使用系数 f ₁ Use factor	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。 The use factor represents the application characteristics of the gearbox, which takes into account the type of load of the gearbox and the daily operating hours.
扭转刚度C _{t21} [Nm/Arcmin] Torsional stiffness	由加载力矩和所产生的扭转角之间的比率来定义。C _{t21} =△T/△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。 It is defined by the ratio between the loading moment and the resulting torsion angle.C _{t21} =△T/△It indicates how much torque is needed to rotate the output shaft by an arc. The torsional stiffness is derived from the hysteresis curve. On the graph, you only need to focus on the range of 50% to 100% of T _{2B} , where the curve can be seen as a straight line.
安装力矩 [Nm] Installation torque	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。 The assembly of the gearbox and the connection and installation of the motor and the gearbox (the input shaft adopts the requirement of elastic coupling), there are torque requirements. It is recommended to use a torque wrench to complete the installation steps.
特别注意 Pay special attention	本样本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样本有所差异，应以订购货品的标准图纸为准，在没有特殊指定状态下减速机的输出端尺寸以本样本为准。 本样本给出的所有减速机重量为近似值，实际重量以实物为准。 The size of all the input ends of the gearbox given in this catalogue is for reference only, and the specific size is determined by the size of the shaft extension end of the adapted motor, so the physical dimensions are different from the catalogue, and the standard drawings of the ordered goods shall prevail, and the output size of the gearbox in the absence of special designation shall prevail in this catalogue. The weights of all gearboxes given in this catalogue are approximate, and the actual weight is subject to the actual product.

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PRECISION PLANETARY
GEAR BOX

精密行星减速机

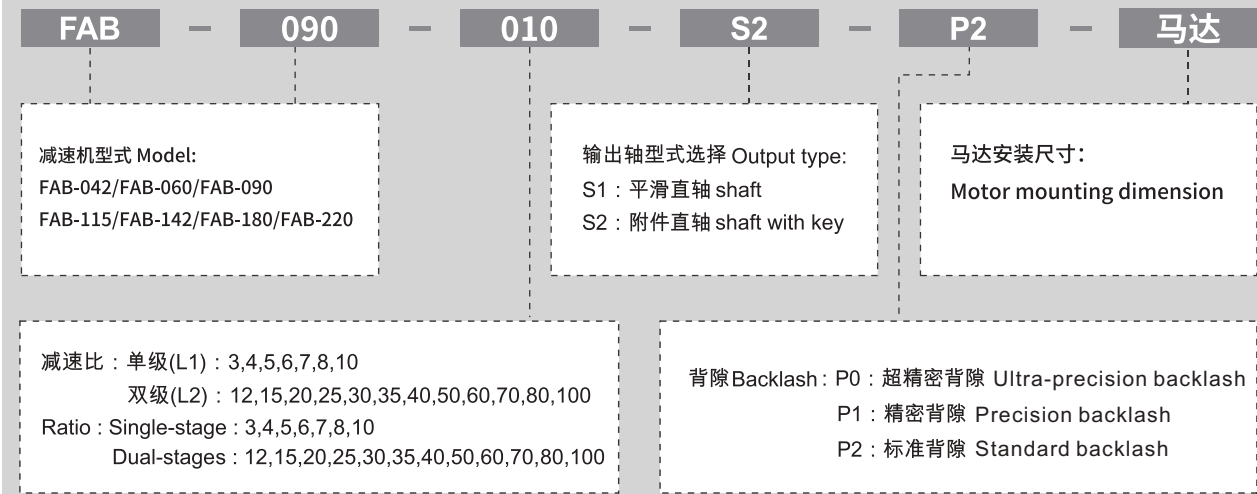
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SKGR三凯

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

FAB系列

型号说明 / model description



选用范例: FAB-090-010-S2-P2-19-70-90-M6-42

技术参数 / technical specification

规格 Model	级数 Stage	减速比 ¹ Ratio	FAB042	FAB060	FAB090	FAB090A	FAB115	FAB115A	FAB142	FAB142A	FAB180	FAB220
额定输出力矩T _{2N} Rated output torque	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
		12	20	55	130	130	208	208	342	342	588	1,140
		15	20	55	130	130	208	208	342	342	588	1,140
		20	19	50	140	140	290	290	542	542	1,050	1,700
	2	25	22	60	160	160	330	330	650	650	1,200	2,000
		30	22	55	130	130	208	208	342	342	588	1,140
		35	22	60	160	160	330	330	650	650	1,200	2,000
		40	22	50	140	140	290	290	542	542	1,050	1,700
		50	22	60	160	160	330	330	650	650	1,200	2,000
		60	20	55	150	150	310	310	600	600	1,100	1,900
		70	19	50	140	140	300	300	550	550	1,100	1,800
		80	17	45	120	120	260	260	500	500	1,000	1,600
		100	14	40	100	100	230	230	450	450	900	1,500
最大输出力矩T _{2S} /Max.output torque	Nm	1, 2	3~100	3倍额定输出力矩 3 times the rated output torque								
额定输入转速n ₁ /Rated input speed	rpm	1, 2	3~100	5,000	5,000	4,000	4,000	4,000	4,000	3,000	3,000	2,000
最大输入转速n _{1S} /Max.input speed	rpm	1, 2	3~100	10,000	10,000	8,000	8,000	8,000	8,000	6,000	6,000	4,000
超精密背隙 P0/Ultra-precision backlash	arcmin	1	3~10	—	—	≤1	≤1	≤1	≤1	≤1	≤1	≤1
		2	3~100	—	—	—	—	≤3	≤3	≤3	≤3	≤3
精密背隙 P1/Precision backlash	arcmin	1	3~10	≤3	≤3	≤3	≤5	≤3	≤5	≤3	≤5	≤3
		2	12~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤5
标准背隙 P2/Precision backlash	arcmin	1	3~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	12~100	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7
扭转刚性/Torsional rigidity	Nm/arcmin	1, 2	3~100	3	7	14	14	25	25	50	50	145 225
容许径向力F _{2rS} ² /Allowable radial force	N	1, 2	3~100	780	1,530	3,250	3,250	6,700	6,700	9,400	9,400	14,500 50,000
容许轴向力F _{2a1S} ² /Allowable radial force	N	1, 2	3~100	350	630	1,300	1,300	3,000	3,000	4,000	4,000	6,200 35,000
容许轴向力F _{2a2S} ² /Allowable radial force	N	1, 2	3~100	390	765	1,625	1,625	3,350	3,350	4,700	4,700	7,250 25,000
使用寿命/Life time	hr	1, 2	3~100	20,000*								
效率η/Efficiency	%	1	3~10	≥97%								
		2	12~100	≥94%								
重量/Weight	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	5.3	9	11.2	17.5	17.5	33 60
使用温度/Operating temperature	°C	1, 2	3~100	-10°C~+90°C								
润滑/lubrication		1, 2	3~100	合成润滑油脂 Synthetic lubricating grease								
防护等级/Ingress protection		1, 2	3~100	IP65								
安装方向/Mount position		1, 2	3~100	任意方向 Any direction								
噪音值(n=3000rpm)/Noise level	dB	1, 2	3~100	≤56	≤58	≤60	≤60	≤63	≤63	≤65	≤65	≤67 ≤70

减速机转动惯量 Gearbox moment of inertia

规格 Model	级数 Stage	减速比 ¹ Ratio	FAB042	FAB060	FAB090	FAB090A	FAB115	FAB115A	FAB142	FAB142A	FAB180	FAB220
转动惯量J ₁ Moment of inertia	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
		12	0.03	0.14	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
		15	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
		20	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
	2	25	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
		30	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
		35	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
		40	0.03	0.13	0.13	0.44	0.47	2.57	2.71	7.03	7.42	23.29
		50	0.03	0.13	0.13	0.44	0.44	2.57	2.57	7.03	7.03	22.51
		60	0.03	0.13	0.13	0.44	0.44	2.57	2.57	7.03	7.03	22.51
		70	0.03	0.13	0.13	0.44	0.44	2.57	2.57	7.03	7.03	22.51
		80	0.03	0.13	0.13	0.44	0.44	2.57	2.57	7.03	7.03	22.51
		100	0.03	0.13	0.13	0.44	0.44	2.57	2.57	7.03	7.03	22.51

1.减速比Ratio(i=N_{in}/N_{out})

* 连续运转降低使用寿命二分之一。

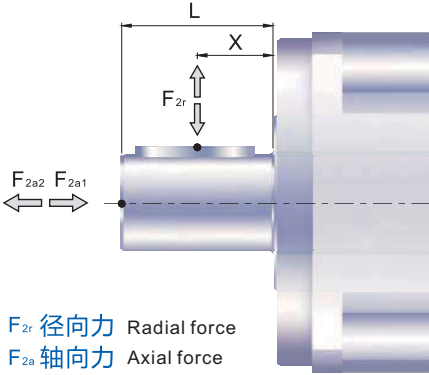
The lifetime will be shortened by half under continuous operation.

2.输出转速 100rpm 时，作用于输出轴中心位置。

When the output speed is 100rpm, it applies on the center of the output shaft.

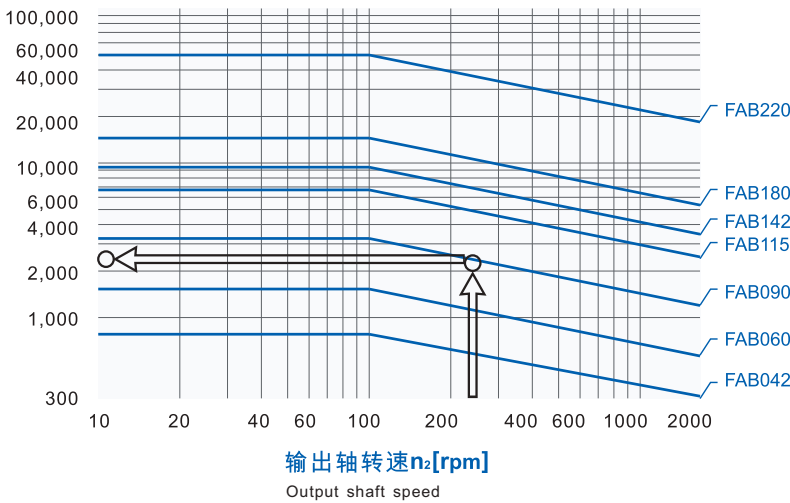
减速机输出轴之容许径向力及轴向力

ALLOWABLE RADIAL AND AXIAL FORCES ON THE OUTPUT SHAFT OF THE GEARBOX



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

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

容许径向力F_{2rB}[N]施力于轴中心位置Permissible radial force F_{2rB}【N】apply force to the center of the shaft

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

When the radial force F_{2r} is applied to the center of the shaft, i.e. X=1/2xL, the allowable radial force F_{2rB} that can be withstood by different specifications of reducers with a service life of 20,000hr* under different output speeds is as follows:

$$F_{2a1B} = 0.2 \times F_{2rB}$$

$$F_{2a2B} = 0.1 \times F_{2rB}$$

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，查出位置负荷系数K_b，在代入下列公式求出容许

When the radial force F_{2r} is not in the center of the shaft, the closer to the gearbox, that is, X<1/2xL, the allowable radial force that can be borne becomes larger, and the farther away from the reducer, i.e., X>1/2xL, the allowable force that can be borne becomes smaller.

径向力 : Radial force

$$F'_{2rB} = K_b \times F_{2rB}$$

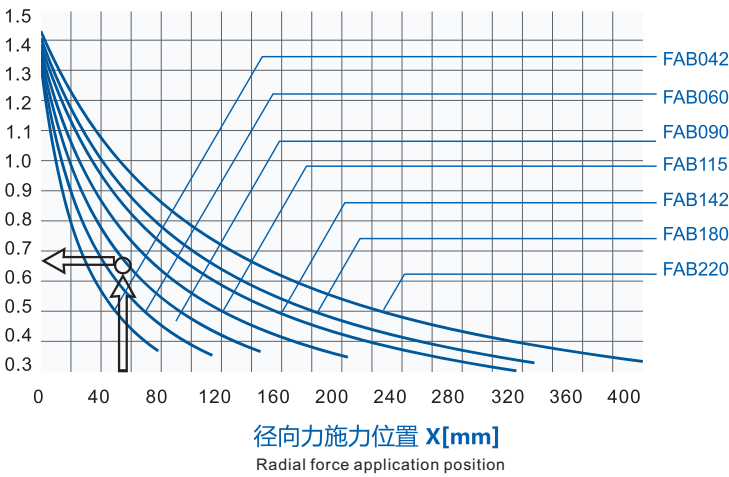
轴向力: Axial force

$$F'_{2a1B} = 0.2 \times F'_{2rB}$$

$$F'_{2a2B} = 0.1 \times F'_{2rB}$$

位置负荷系数K_b

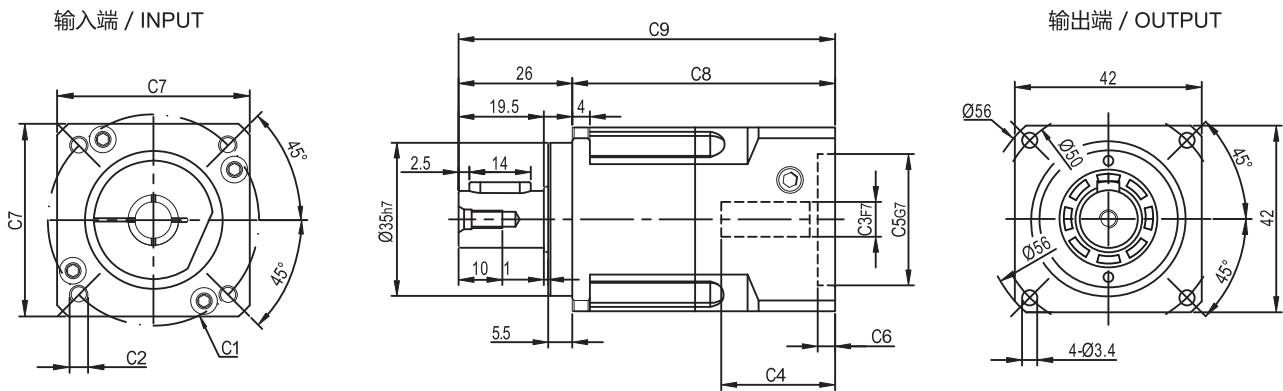
Positional load coefficient



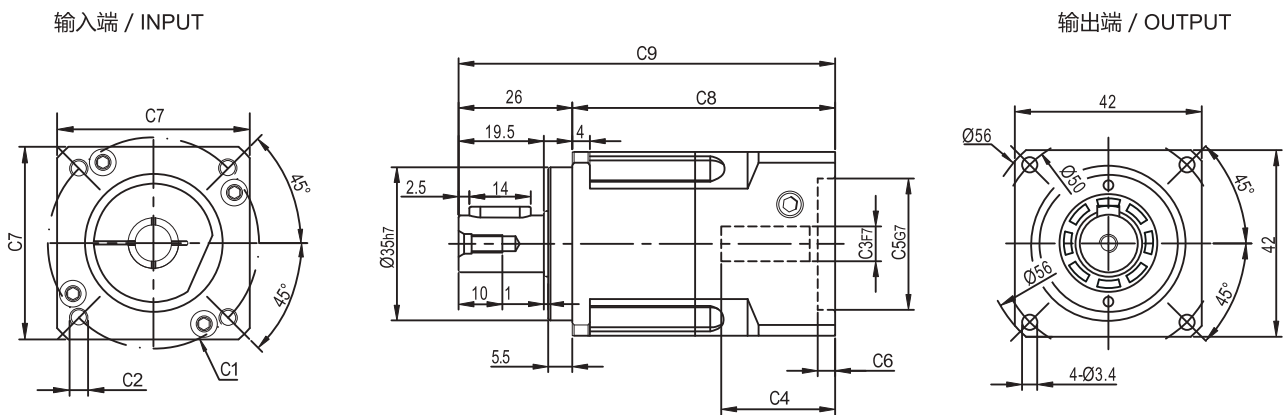
*连续运转降低使用寿命二分之一。The lifetime will be shortened by half under continuous operation.

产品尺寸 / product dimension

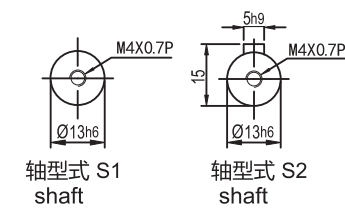
FAB-042-L1



FAB-042-L2



输出轴径/Output Diameter

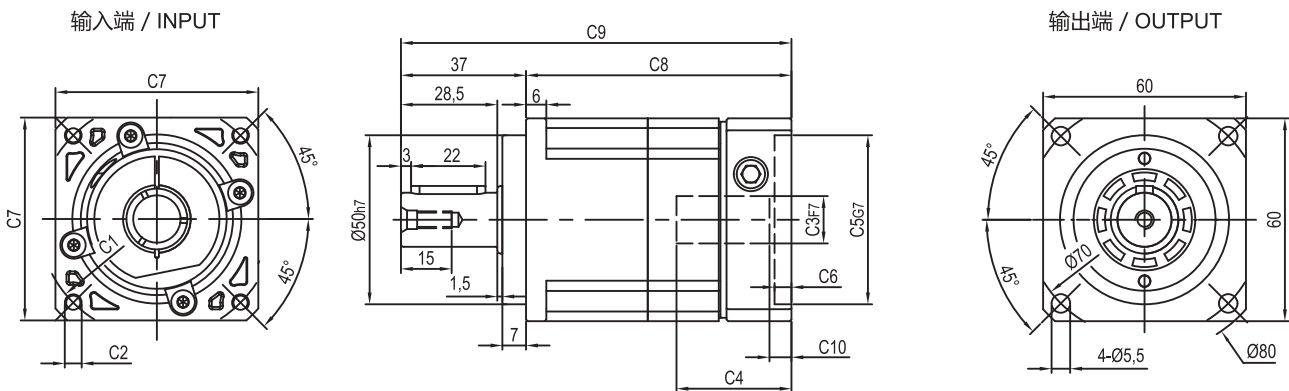


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAB-042-L1	Ø46	4-M4x10	Ø8	26	Ø30	4	42	60	86
	Ø45	4-M3x8							
FAB-042-L2	Ø46	4-M4x10	Ø8	26	Ø30	4	42	84.5	110.5
	Ø45	4-M3x8							

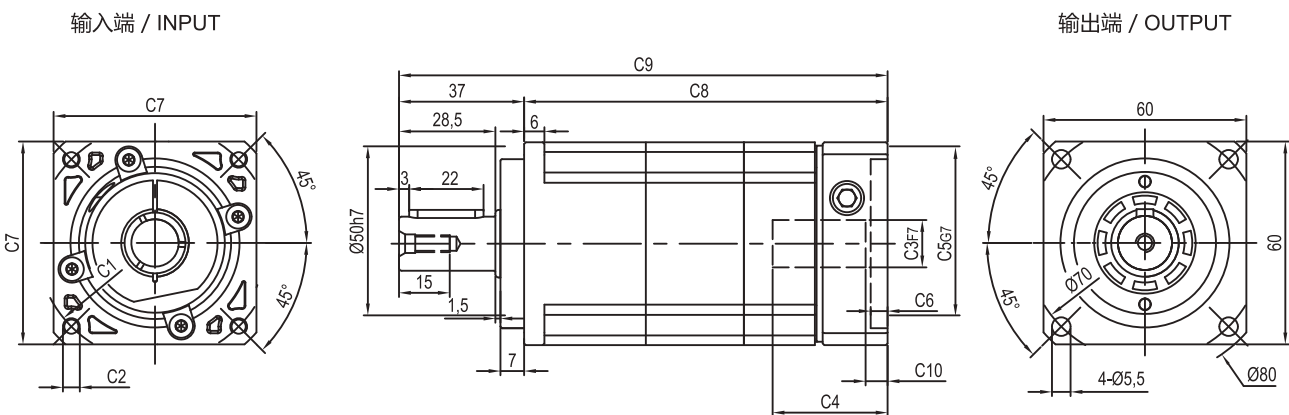
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.

产品尺寸 / product dimension

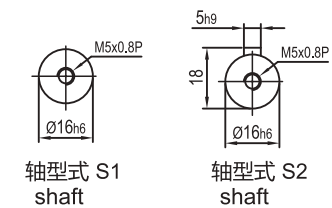
FAB-060-L1



FAB-060-L2



输出轴径/Output Diameter

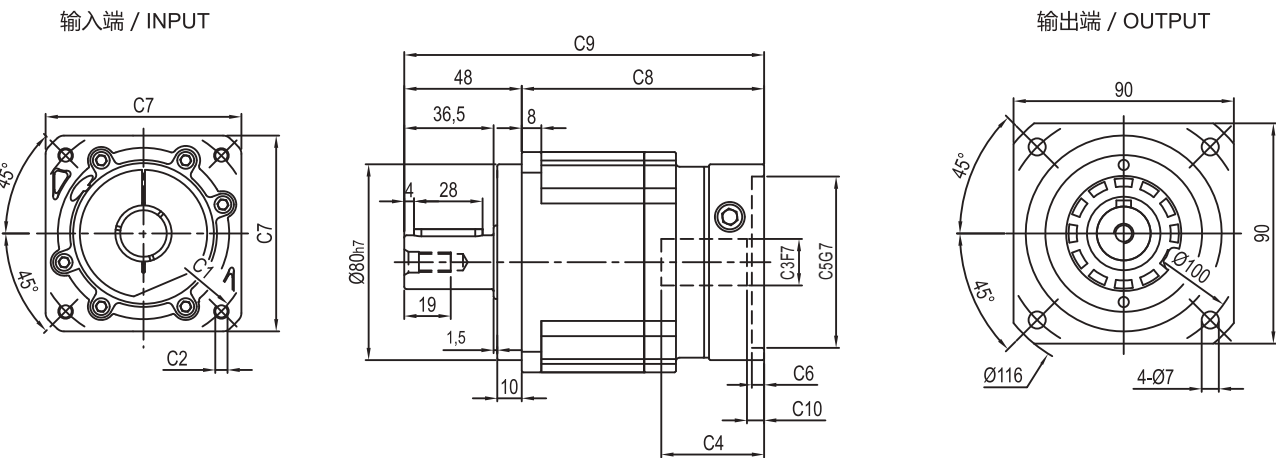


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-060-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	78.5	115.5	5.5
FAB-060-L2								107.5	144.5	5.5
FAB-060-L1	Ø70	4-M4x10,4-M5x12	Ø11, Ø14	34	Ø50	5	60	78.5	115.5	5.5
FAB-060-L2								107.5	144.5	5.5
FAB-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	85	122	12
FAB-060M1-L2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

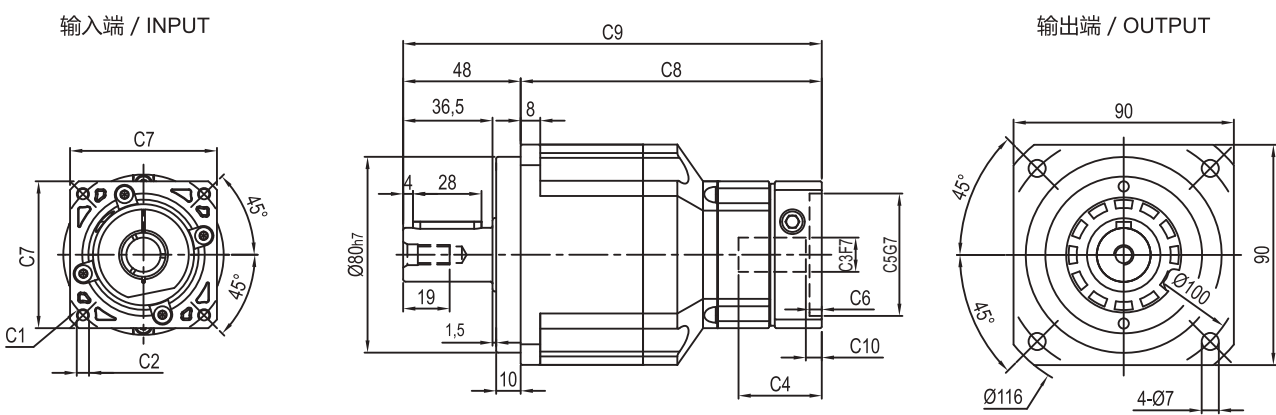
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*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

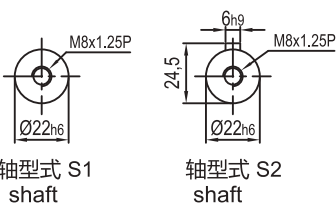
FAB-090-L1



FAB-090-L2



输出轴径/Output Diameter

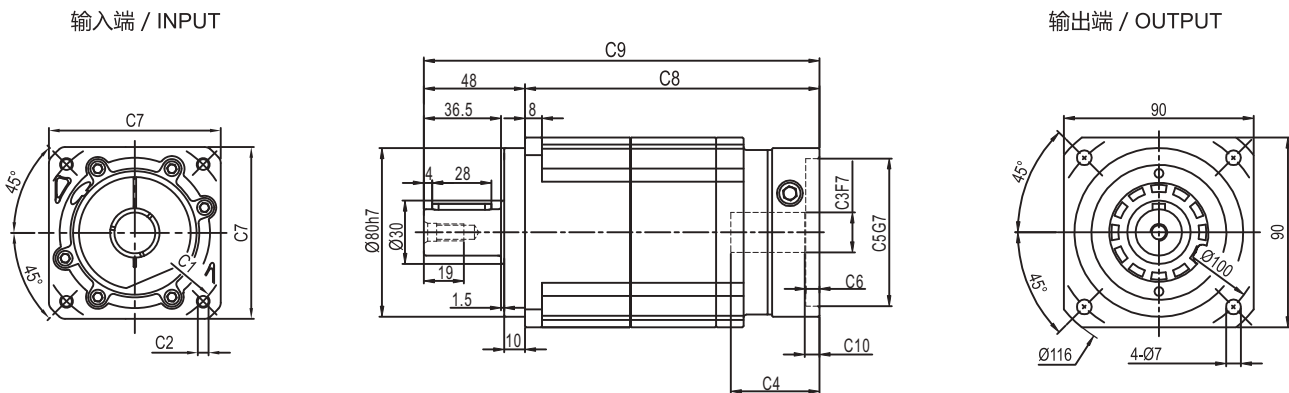


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-090-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	99	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	99	147	6
FAB-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	114.5	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	117	165	19
FAB-090-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	123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

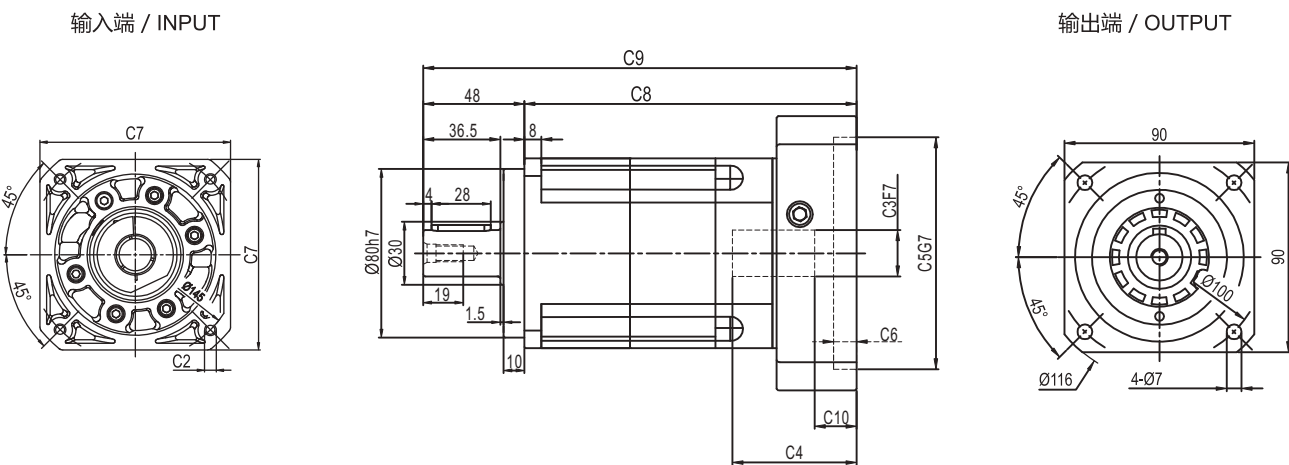
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*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

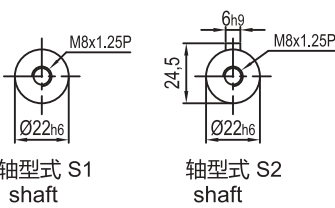
FAB-090A-L2



FAB-090A-L2



输出轴径/Output Diameter

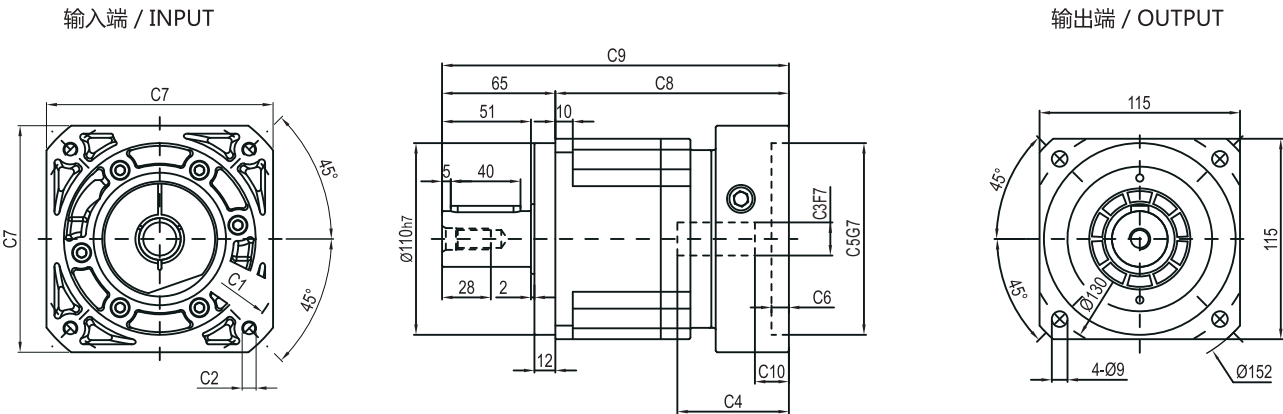


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-090A- L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	139.5	187.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	139.5	187.5	6
FAB-090AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	155	203	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	157.5	205.5	19

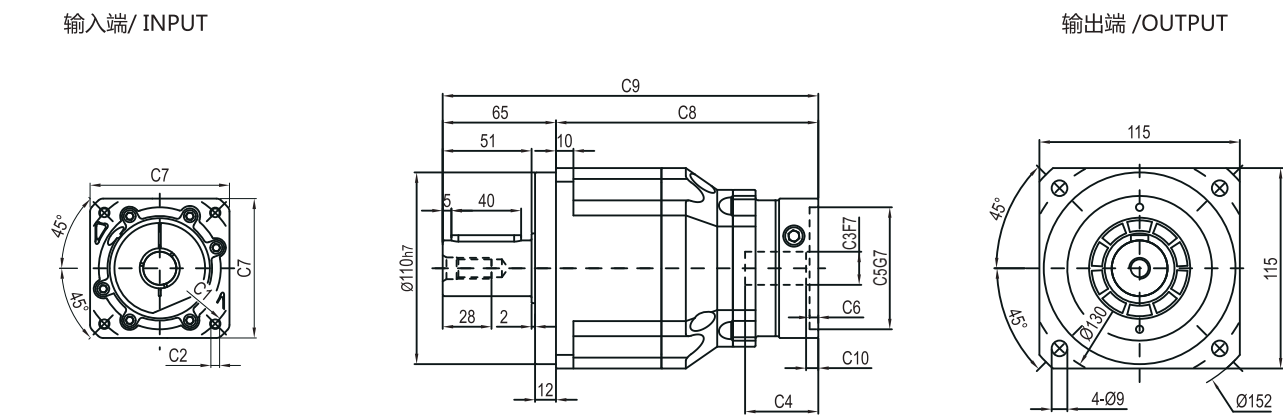
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产品尺寸 / product dimension

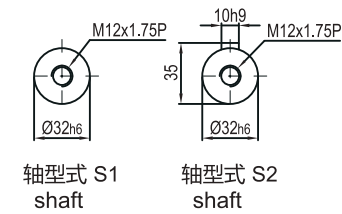
FAB-115-L1



FAB-115-L2



输出轴径/Output Diameter

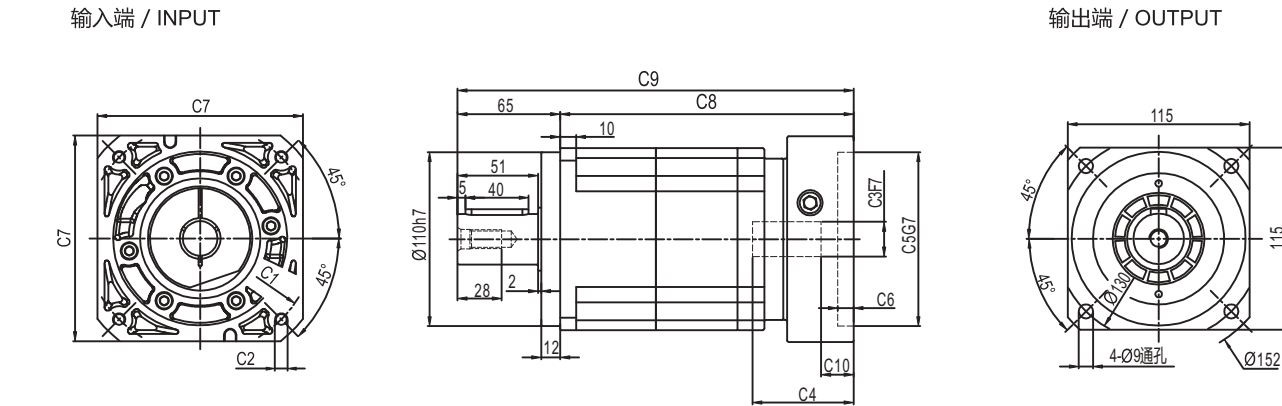


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-115-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	134	199	19.5
FAB-115M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	151.5	216.5	28
FAB-115-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	150.5	215.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	150.5	215.5	6
FAB-115M1-L2	Ø115	4-M8x20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

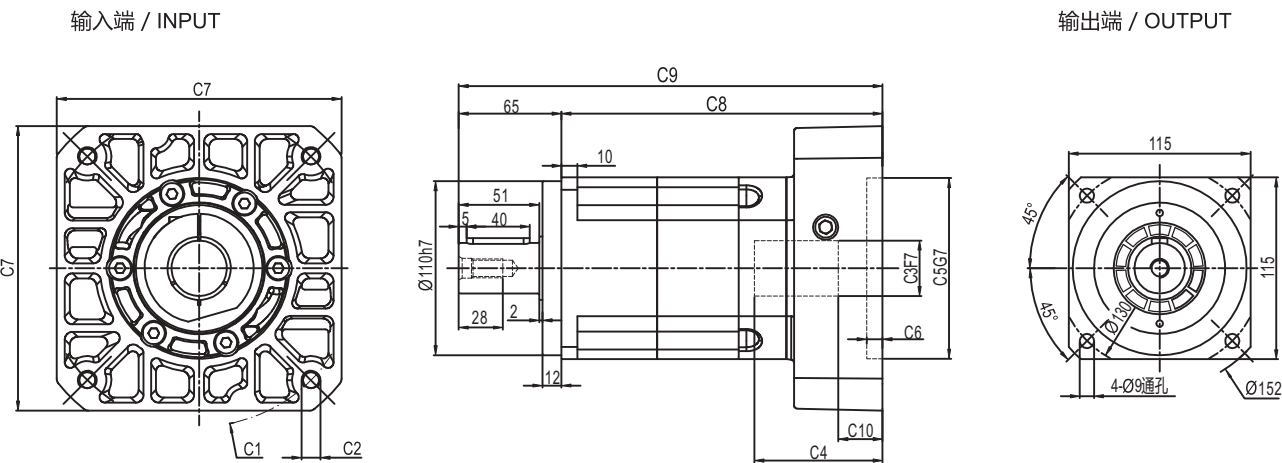
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*C1~C7 are motor(metric standard) specific dimensions, which could be customized.
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*M1: Limit hole (Version number)

产品尺寸 / product dimension

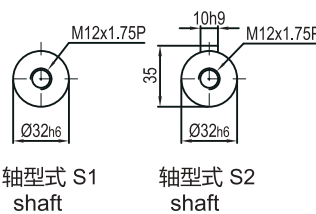
FAB-115A-L2



FAB-115A-L2



输出轴径/Output Diameter



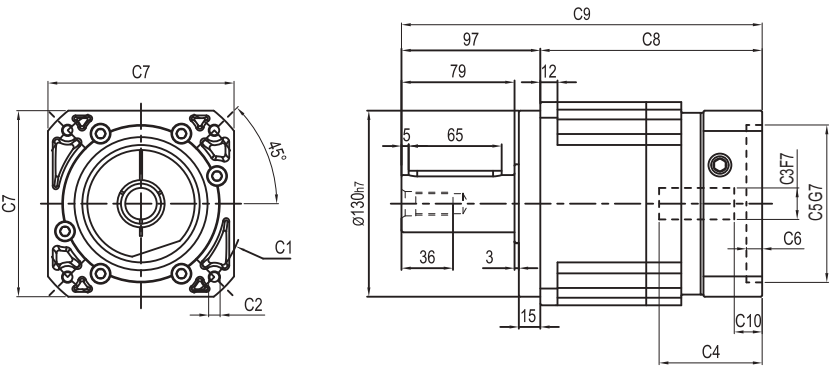
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-115A-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	185.5	205.5	19.5
FAB-115AM1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	203	268	28

*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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1: Limit hole (Version number)

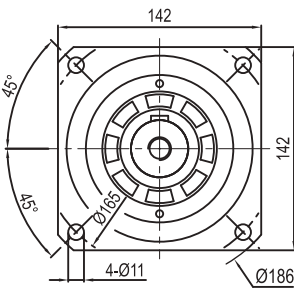
产品尺寸 / product dimension

FAB-142-L1

输入端/ INPUT

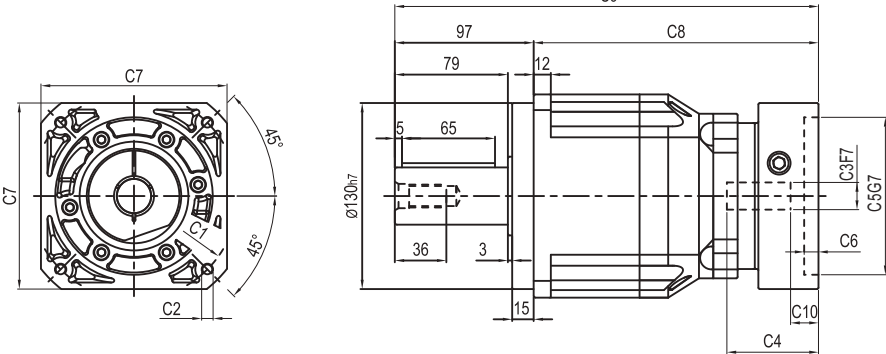


输出端/OUTPUT

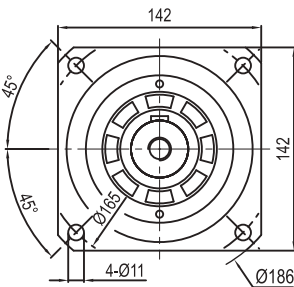


FAB-142-L2

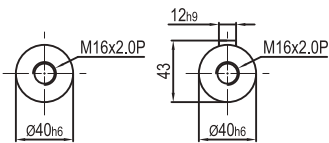
输入端/ INPUT



输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

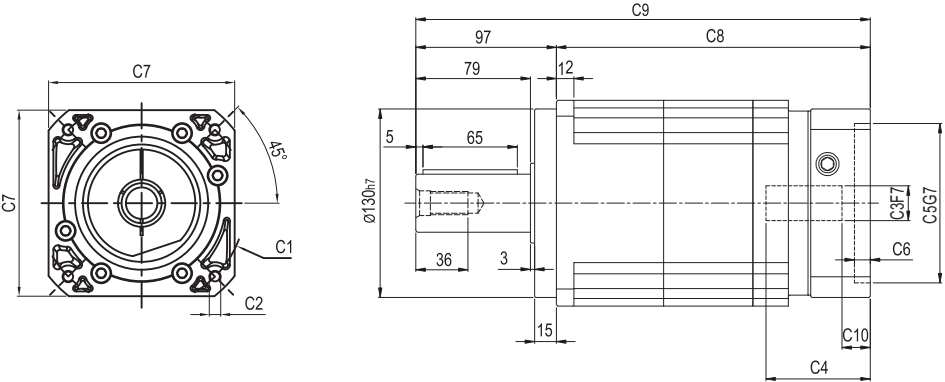
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-142-L1	Ø145	4-M8x20	Ø22, Ø24	72	Ø110	11	130	155	252	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	165	262	25
FAB-142-L2	Ø145	4-M8x20	Ø19, Ø22, Ø24	64	Ø110	10	130	199	296	19.5
FAB-142M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	216.5	313.5	28

*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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

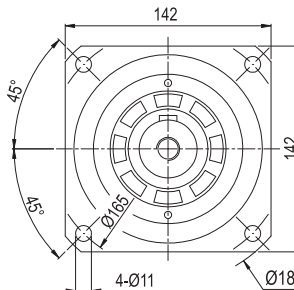
产品尺寸 / product dimension

FAB-142A-L2

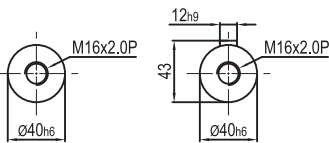
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

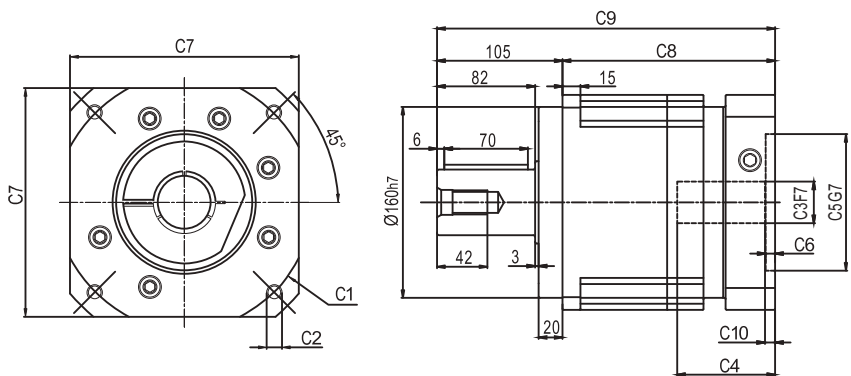
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-142A- L2	Ø145	4-M8x20	Ø22, Ø24	72	Ø110	11	130	155	252	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	165	262	25

*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~C7 are motor(metric standard) specific dimensions, which could be customized.

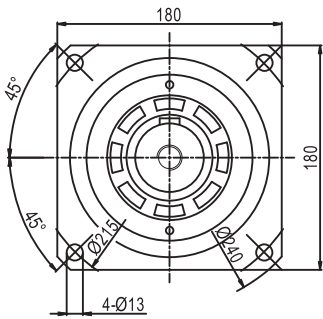
产品尺寸 / product dimension

FAB-180-L1

输入端/INPUT

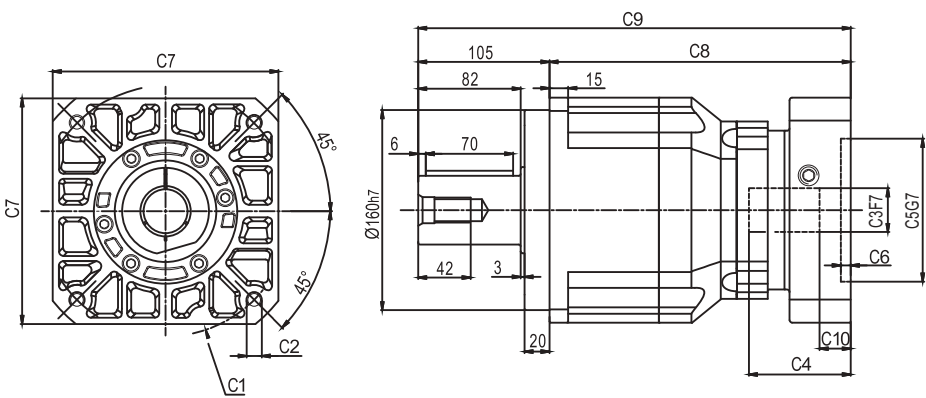


输出端/ OUTPUT

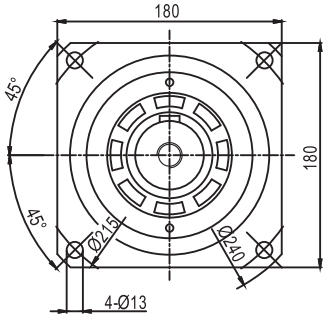


FAB-180-L2

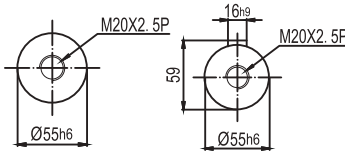
输入端/ INPUT



输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

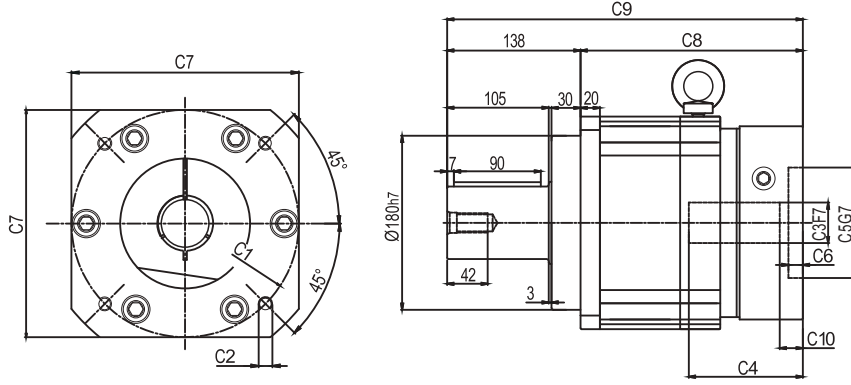
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-180-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	178	283	8.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	213.5	318.5	45.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	183	288	13.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	213.5	318.5	45.5
FAB-180-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	231	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~C7 are motor(metric standard) specific dimenisions, which could be customized.

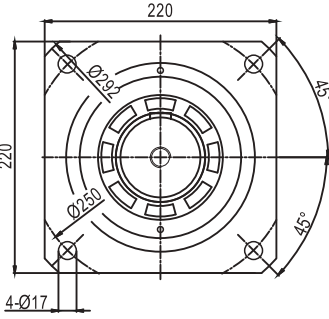
产品尺寸 / product dimension

FAB-220-L1

输入端/ INPUT

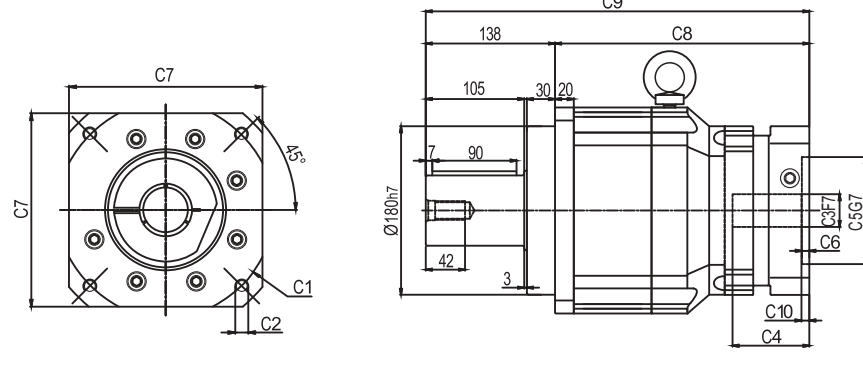


输出端/OUTPUT

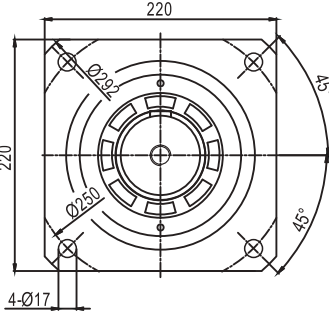


FAB-220-L2

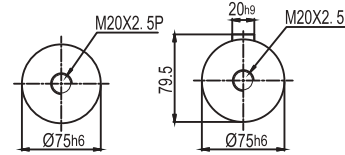
输入端/ INPUT



输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAB-220-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-220-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~C7 are motor(metric standard) specific dimenisions, which could be customized.

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

FABR系列

型号说明 / model description

FABR

—

090

—

010

—

S2

—

P2

—

马达

减速机型式 Model :
FABR-042/FABR-060/FABR-090
FABR-115/FABR-142/FABR-180/FABR-220

输出轴型式选择 Output type:
S1 : 平滑直轴 shaft
S2 : 附件直轴 shaft with key

马达安装尺寸:
Motor mounting dimension

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
Ratio : Single-stage : 3,4,5,6,7,8,10,14,20
Dual-stages : 12,15,20,25,30,35,40,50,60,70
80,100,120,140,160,200

背隙 Backlash : P0 : 超精密背隙 Ultra-precision backlash
P1 : 精密背隙 Precision backlash
P2 : 标准背隙 Standard backlash

选用范例: FABR-090-010-S2-P2-19-70-90-M6-45

技术参数 / technical specification

规格 Model	级数 Stage	减速比 ¹ Ratio	FABR042	FABR060	FABR090	FABR090A	FABR115	FABR115A	FABR142	FABR142A	FABR180	FABR220
额定输出力矩T _{2N} Rated output torque	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
		12	—	55	130	130	208	208	342	342	588	1,140
	2	15	20	55	130	130	208	208	342	342	588	1,140
		20	19	50	140	140	290	290	542	542	1,050	1,700
		25	22	60	160	160	330	330	650	650	1,200	2,000
		30	22	55	130	130	208	208	342	342	588	1,140
		35	22	60	160	160	330	330	650	650	1,200	2,000
		40	22	50	140	140	290	290	542	542	1,050	1,700
		50	22	60	160	160	330	330	650	650	1,200	2,000
		60	22	55	150	150	310	310	600	600	1,100	1,900
		70	22	60	160	160	330	330	650	650	1,200	2,000
		80	22	50	140	140	290	290	542	542	1,050	1,700
		100	22	60	160	160	330	330	650	650	1,200	2,000
		120	—	—	150	150	310	310	600	600	1,100	1,900
		140	—	—	140	140	300	300	550	550	1,100	1,800
		160	—	—	120	120	260	260	500	500	1,000	1,600
		200	—	—	100	100	230	230	450	450	900	1,500
最大输出力矩T _{2B} /Max.output torque	Nm	1,2	3~200	3倍额定输出力矩 3 times the rated output torque								
额定输入转速n ₁ /Rated input speed	rpm	1,2	3~200	5,000	5,000	4,000	4,000	4,000	4,000	3,000	3,000	2,000
最大输入转速n _{1B} /Max.input speed	rpm	1,2	3~200	10,000	10,000	8,000	8,000	8,000	8,000	6,000	6,000	4,000
超精密背隙 P0/Ultra-precision backlash	arcmin	1	3~20	—	—	≤2	≤2	≤2	≤2	≤2	≤2	≤2
		2	12~200	—	—	≤4	≤4	≤4	≤4	≤4	≤4	≤4
精密背隙 P1/Precision backlash	arcmin	1	3~20	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4
		2	12~200	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7
标准背隙 P2/Precision backlash	arcmin	1	3~20	≤6	≤6	≤6	≤7	≤6	≤7	≤6	≤6	≤6
		2	12~200	≤9	≤9	≤9	≤9	≤9	≤9	≤9	≤9	≤9
扭转刚性/Torsional rigidity	Nm/arcmin	1,2	3~200	3	7	14	14	25	25	50	50	145
容许径向力F _{2B} ² /Allowable radial force	N		3~200	780	1,530	3,250	3,250	6,700	6,700	9,400	9,400	14,500
容许轴向力F _{2aB} ² /Allowable radial force	N	1,2	3~200	350	630	1,300	1,300	3,000	3,000	4,000	4,000	6,200
容许轴向力F _{2aB} ² /Allowable radial force	N	1,2	3~200	390	765	1,625	1,625	3,350	3,350	4,700	4,700	7,250
使用寿命/Life time	hr	1,2	3~200	20,000*								
效率η /Efficiency	%	1	3~20			≤95%						
		2	12~200			≤92%						
重量/Weight	kg	1	3~20	0.9	2.1	6.4	—	13	—	24.5	—	51
		2	12~200	1.2	2.5	7.8	9.1	14.2	18.6	27.5	35	54
使用温度/Operating temperature	°C	1,2	3~200	-10°C~+90°C								
润滑/lubrication		1,2	3~200	合成润滑油脂 Synthetic lubricating grease								
防护等级/Ingress protection		1,2	3~200	IP65								
安装方向/Mount position		1,2	3~200	任意方向 Any direction								
噪音值(n=3000rpm)/Noise level	dB	1,2	3~200	≤61	≤63	≤65	≤65	≤68	≤68	≤70	≤70	≤72

减速机转动惯量 Gearbox moment of inertia

规格 Model	级数 Stage	减速比 ¹ Ratio	FABR042	FABR060	FABR090	FABR090A	FABR115	FABR115A	FABR142	FABR142A	FABR180	FABR220
转动惯量J ₁ Moment of inertia	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	2.23	2.23	6.84	6.44	6.84	23.4	68.9
		50	0.09	0.07	0.31	1.87	1.87	6.25	6.25	6.25	21.8	65.6
		60	0.09	0.07	0.35	2.25	2.25	6.84	6.84	6.84	23.4	68.9
		70~100	0.09	0.07	0.31	1.87	1.87	6.25	6.25	6.25	21.8	65.6
		120~200	—	—	0.31	1.87	1.87	6.25	6.25	6.25	21.8	65.6

1.减速比 Ratio(i= N_{in}/N_{out})

* 连续运转降低使用寿命二分之一。

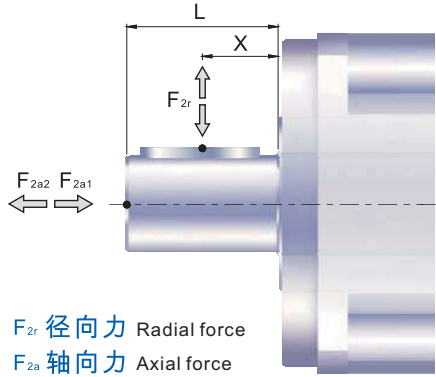
The lifetime will be shortened by half under continuous operation.

2.输出转速 100rpm 时，作用于输出轴中心位置。

When the output speed is 100rpm, it applies on the center of the output shaft.

减速机输出轴之容许径向力及轴向力

ALLOWABLE RADIAL AND AXIAL FORCES ON THE OUTPUT SHAFT OF THE GEARBOX

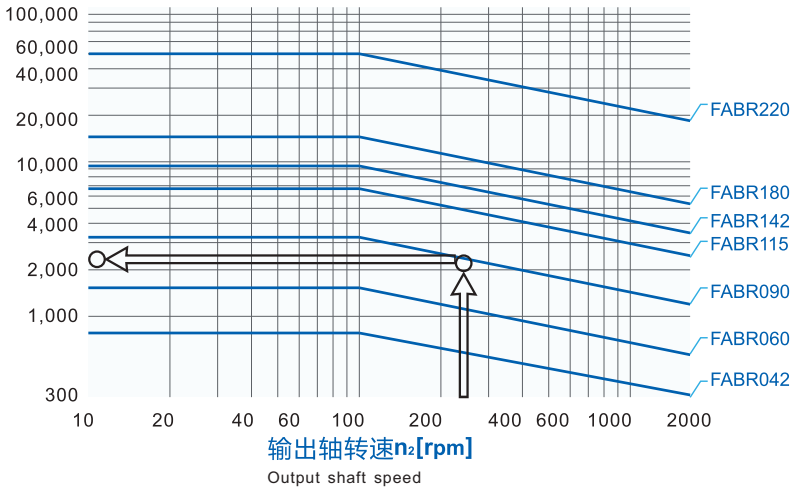


减速机输出轴所能承受之最大径向力及轴向力。端视内部支撑轴承之设计，减速机采用大尺寸的轴承及较大跨距的设计，其能承受更大的径向及轴向负荷。

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

容许径向力 F_{2B}[N] 施力于轴中心位置

Permissible radial force F_{2B}【N】apply force to the center of the shaft



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_{2B}，请参照左图，而能承受之容许轴向力F_{2aB}，为

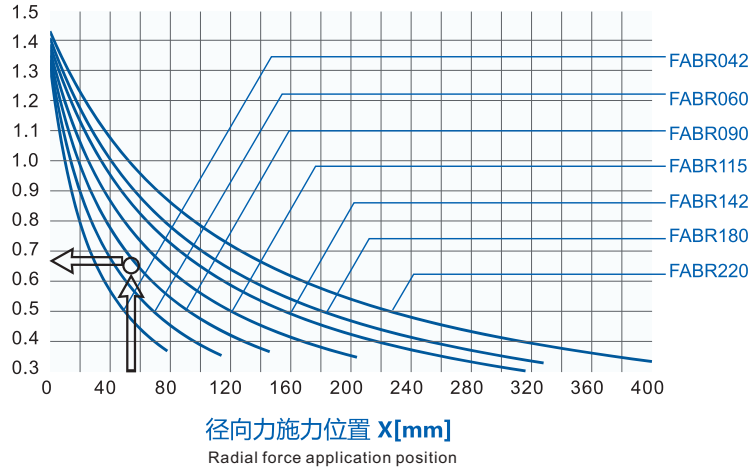
When the radial force F_{2r} is applied to the center of the shaft, i.e. X= 1/2xL, the allowable radial force F_{2B} that can be withstood by different specifications of reducers with a service life of 20,000hr* under different output speeds is as follows:

F_{2a1B}=0.2x F_{2B}

F_{2a2B}=0.1x F_{2B}

位置负荷系数 Kb

Positional load coefficient



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，查出位置负荷系数Kb，在代入下列公式求出容许

When the radial force F_{2r} is not in the center of the shaft, the closer to the gearbox, that is, X<1/2xL, the allowable radial force that can be borne becomes larger, and the farther away from the reducer, i.e., X>1/2xL, the allowable force that can be borne becomes smaller.

径向力 : Radial force

F_{2B}'=K_bx F_{2B}

轴向力: Axial force

F_{2a1B}'=0.2x F_{2B}'

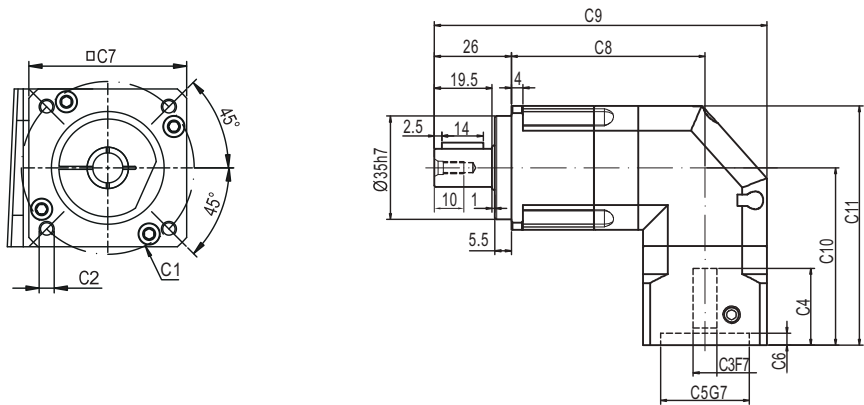
F_{2a2B}'=0.1x F_{2B}'

*连续运转降低使用寿命二分之一。The lifetime will be shortened by half under continuous operation.

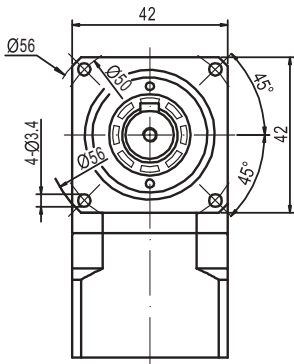
产品尺寸 / product dimension

FABR-042-L1

输入端/INPUT

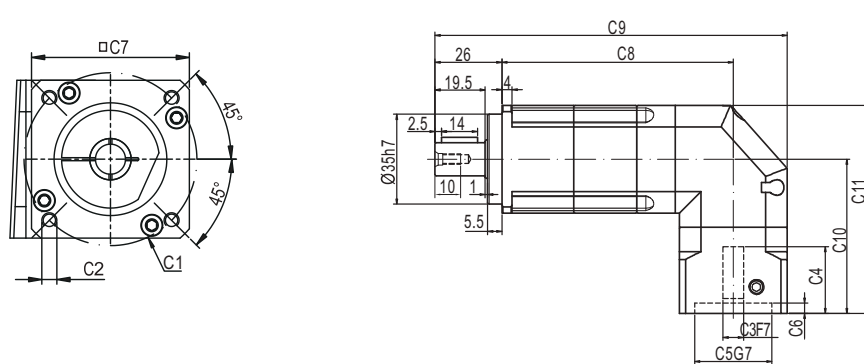


输出端/ OUTPUT

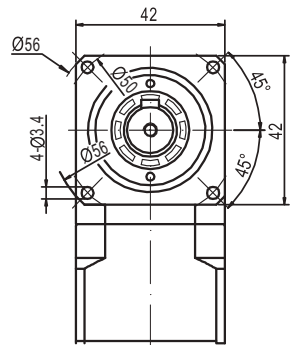


FABR-042-L2

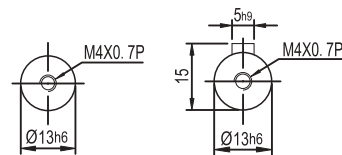
输入端/ INPUT



输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft 轴型式 S2
shaft

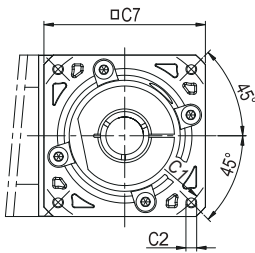
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FABR-042-L1	Ø46	4-M4x10	Ø8	26	Ø30	4	42	65.5	112.5	60	81
	Ø45	4-M3x8									
FABR-042-L2	Ø46	4-M4x10	Ø8	26	Ø30	4	42	90	137	60	81
	Ø45	4-M3x8									

*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 dimenisions, which could be customized.

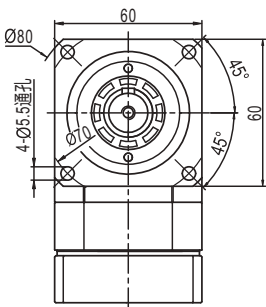
产品尺寸 / product dimension

FABR-060-L1

输入端/ INPUT

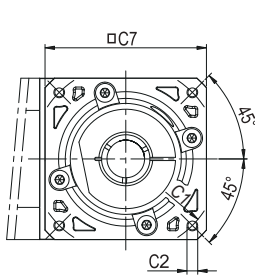


输出端/OUTPUT

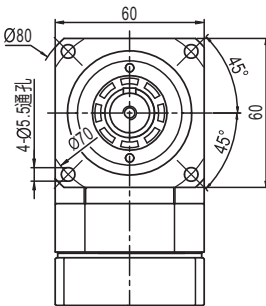


FABR-060-L2

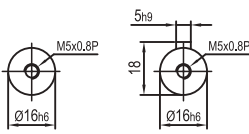
输入端/ INPUT



输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft 轴型式 S2
shaft

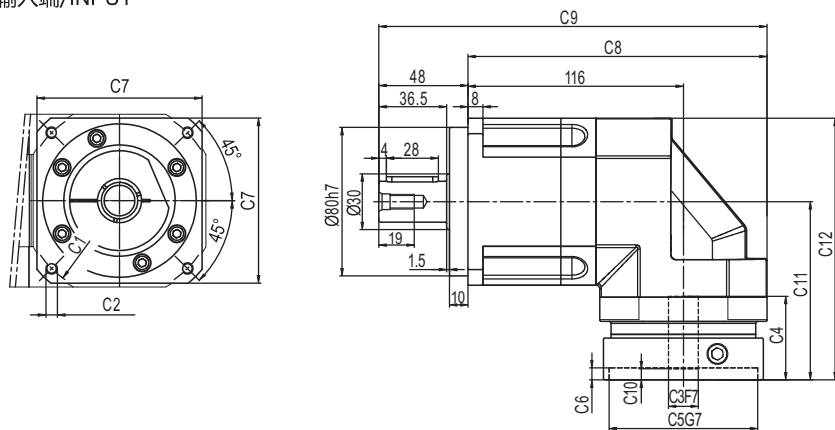
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-060-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	86	153	5.5	77.5	107.5
FABR-060-L2								115	182			
FABR-060-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	86	153	5.5	77.5	107.5
FABR-060-L2								115	182			
FABR-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	86	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 dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

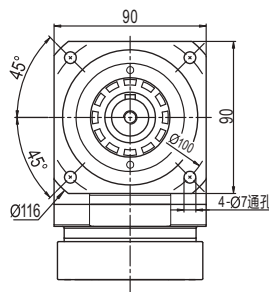
产品尺寸 / product dimension

FABR-090-L1

输入端/INPUT

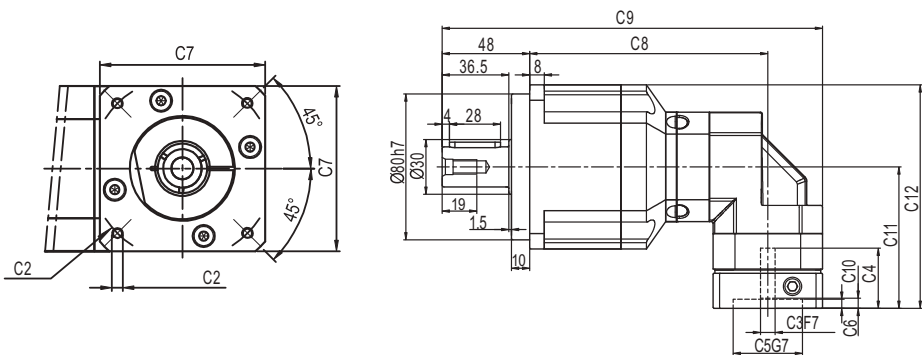


输出端/ OUTPUT

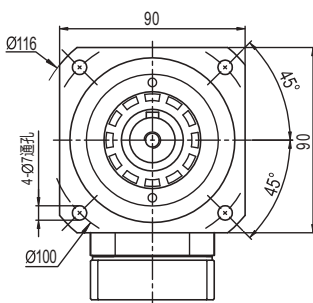


FABR-090-L2

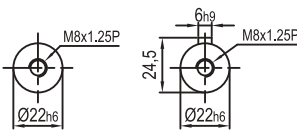
输入端/ INPUT



输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

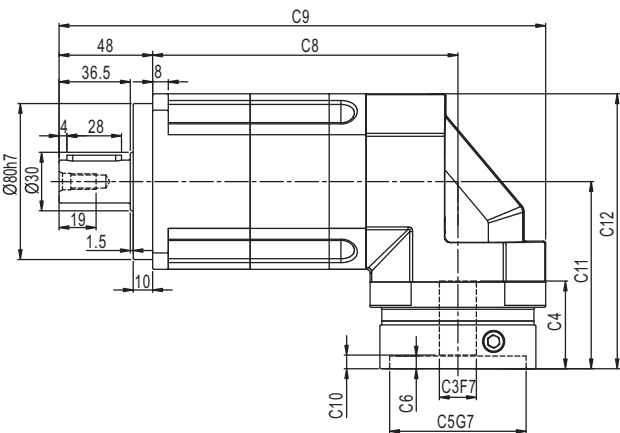
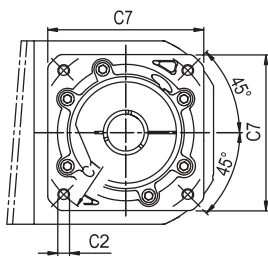
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-090-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	116	209	7	96	141
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	116	209	6	96	141
FABR-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	116	214	16.5	117.5	162.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	116	229	19	120	165
FABR-090-L2	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 dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

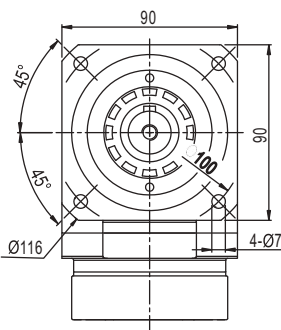
产品尺寸 / product dimension

FABR-090A-L2

输入端 / INPUT

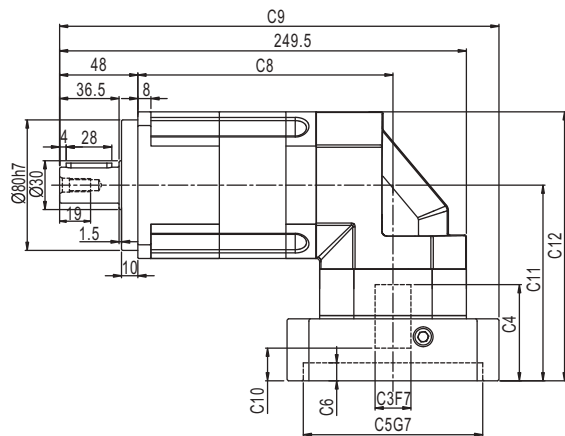
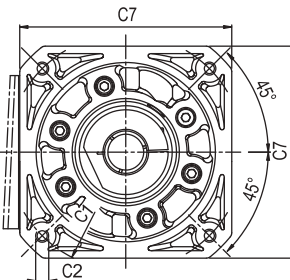


输出端 / OUTPUT

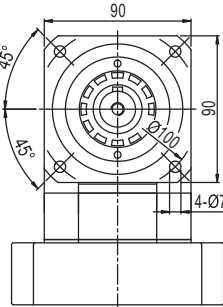


FABR-090A-L2

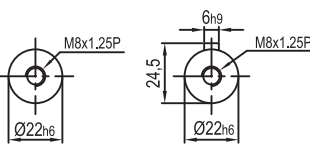
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

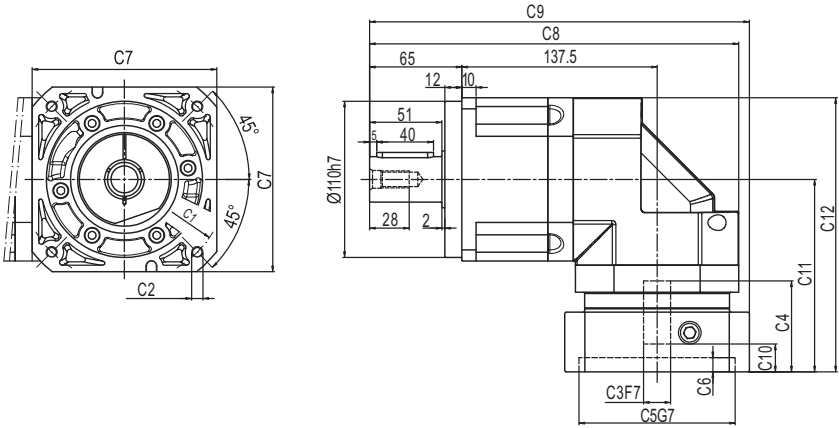
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-090A-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	156.5	249.5	7	96	141
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	156.5	249.5	6	96	141
FABR-090AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	156.5	254.5	16.5	117.5	162.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	10	130	156.5	269.5	19	120	165

*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 dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

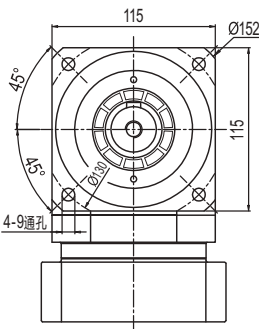
产品尺寸 / product dimension

FABR-115-L1

输入端 / INPUT

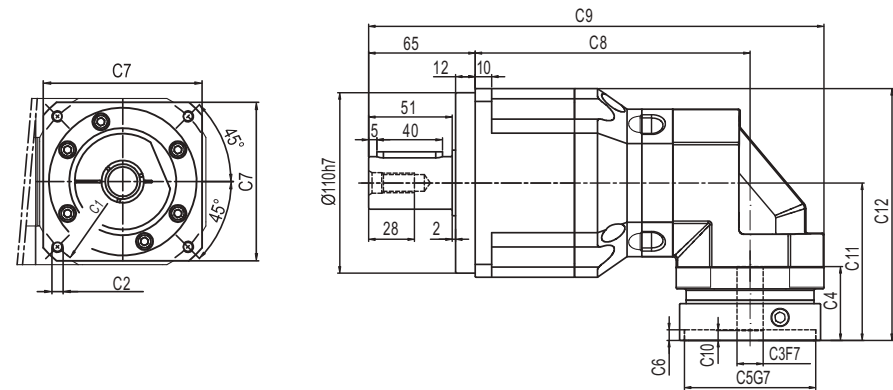


输出端 / OUTPUT

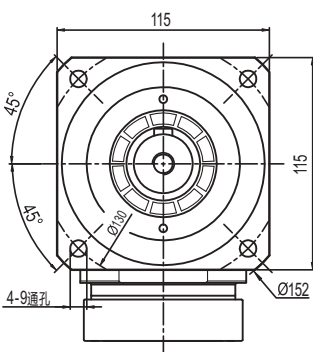


FABR-115-L2

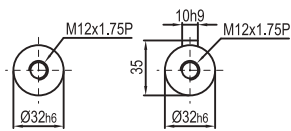
输入端 / INPUT



输出端 / OUTPUT



输出轴径 / Output Diameter



轴型式 S1 shaft
轴型式 S2 shaft

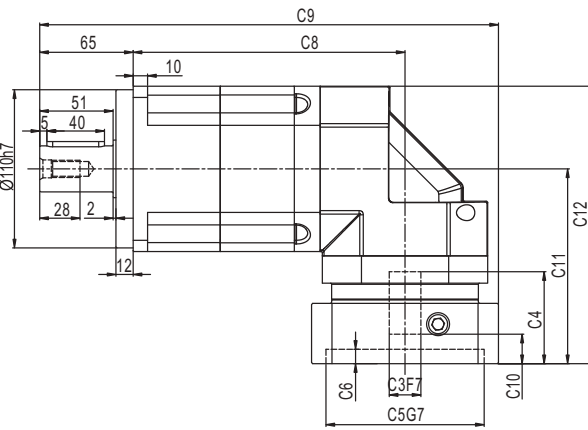
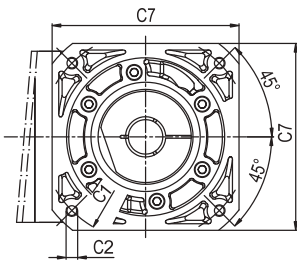
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-115-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	137.5	267.5	19.5	135.5	193
FABR-115M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	137.5	292.5	28	152.5	210
FABR-115-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	167.5	277.5	7	96	153.5
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1: Limit hole (Version number)

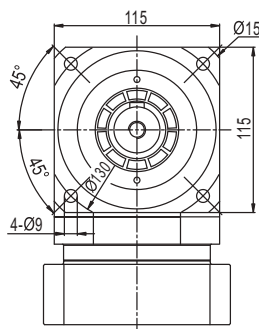
产品尺寸 / product dimension

FABR-115A-L2

输入端 / INPUT

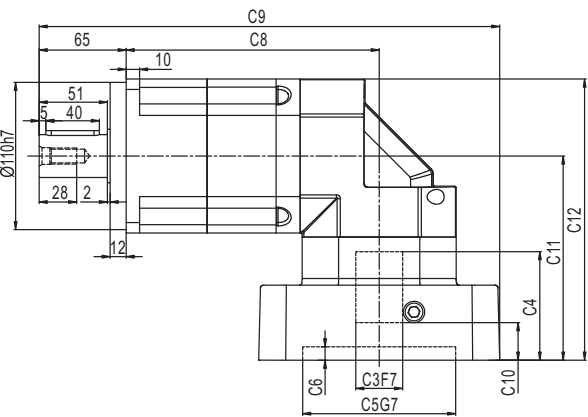
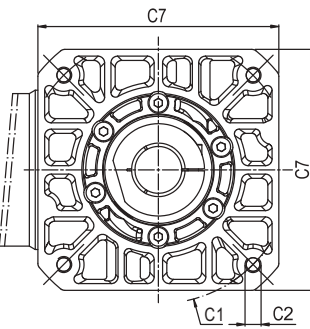


输出端 / OUTPUT

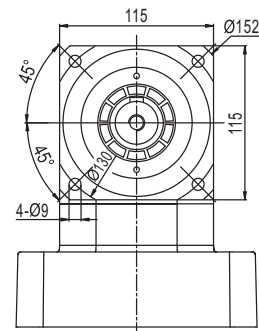


FABR-115A-L2

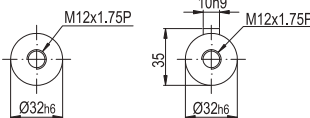
输入端 / INPUT



输出端 / OUTPUT



输出轴径 / Output Diameter



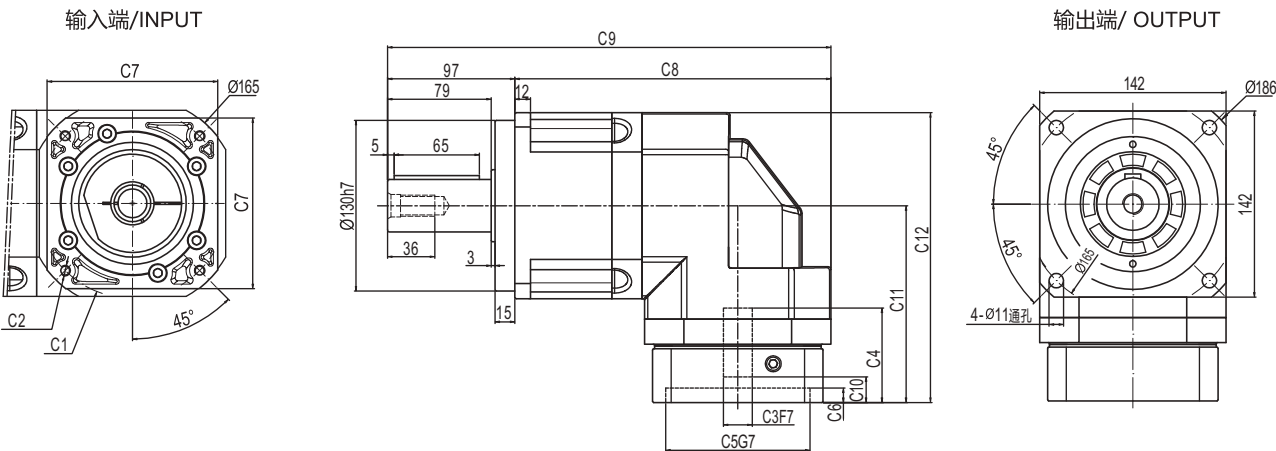
轴型式 S1 shaft
轴型式 S2 shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-115A-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	189	319	19.5	135.5	193
FABR-115AM1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	189	344	28	152.5	210

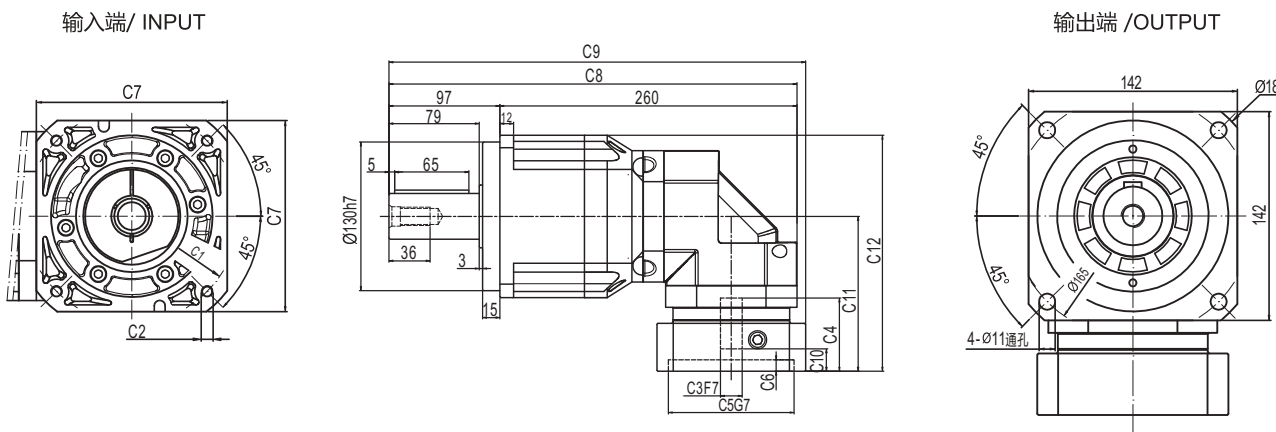
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1: Limit hole (Version number)

产品尺寸 / product dimension

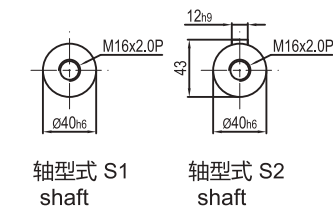
FABR-142-L1



FABR-142-L2



输出轴径/Output Diameter

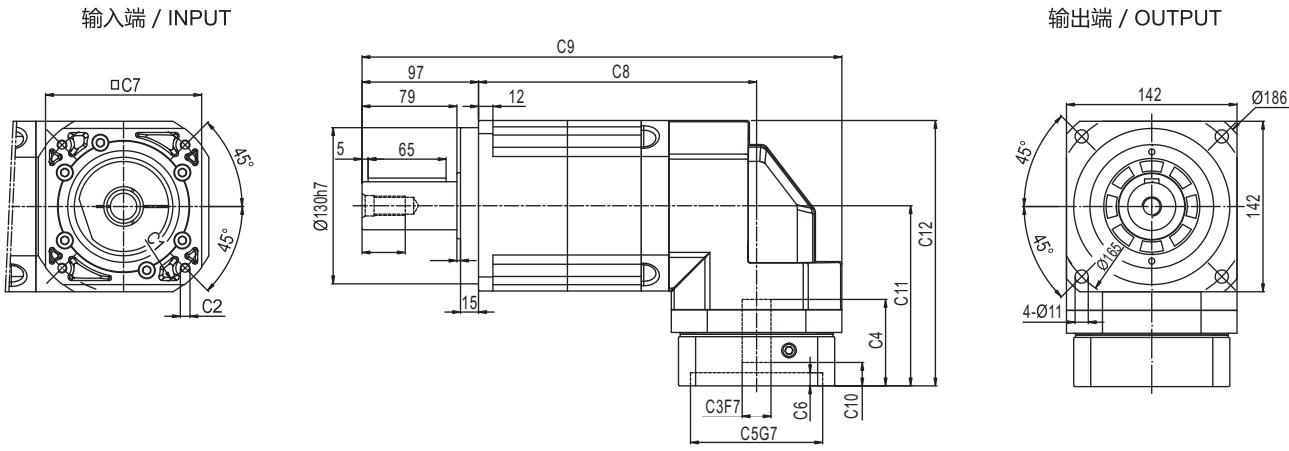


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-142-L1	Ø145	4-M8x20	Ø22, Ø24	72	Ø110	11	130	170	338	19.5	150	221
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	170	357	25	160	231
FABR-142-L2	Ø145	4-M8x20	Ø19, Ø22, Ø24	64	Ø110	10	130	202.5	364.5	19.5	135.5	206.5
FABR-142M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180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

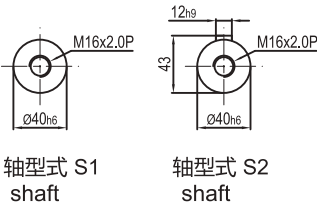
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

FABR-142A-L2



输出轴径/Output Diameter



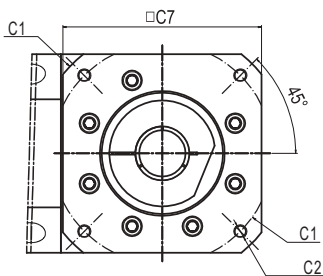
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-142A-L2	Ø145	4-M8x20	Ø22, Ø24	72	Ø110	11	130	231.5	399.5	19.5	150	221
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	231.5	418.5	25	160	231

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.

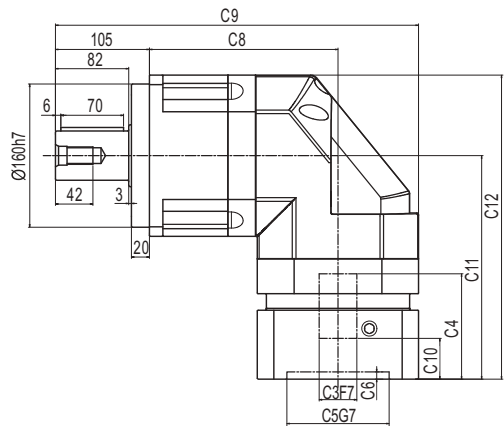
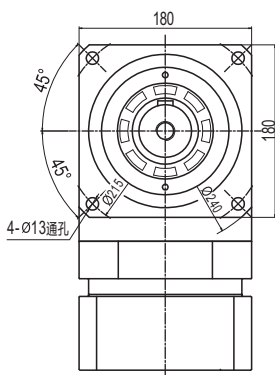
产品尺寸 / product dimension

FABR-180-L1

输入端/ INPUT

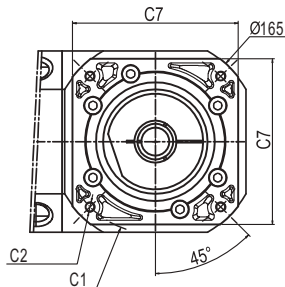


输出端/OUTPUT

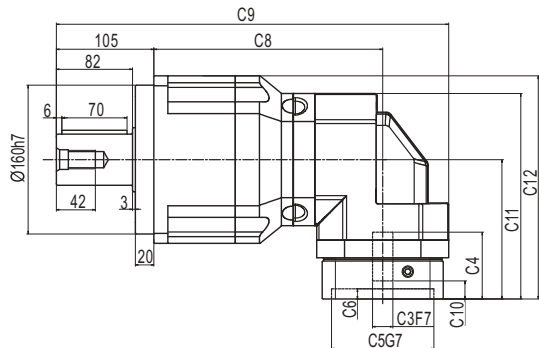
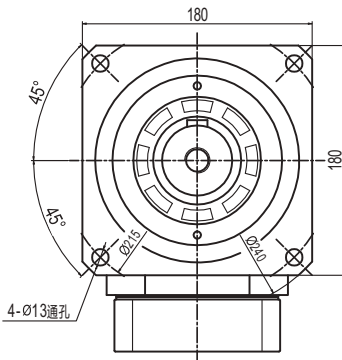


FABR-180-L2

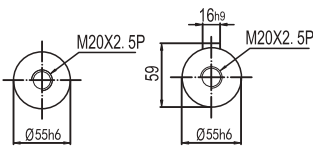
输入端/ INPUT



输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

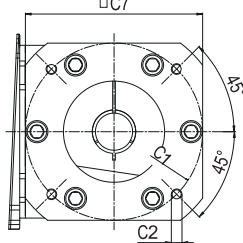
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-180-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	210.5	405.5	8.5	214	304
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	210.5	405.5	45.5	249.5	339.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	210.5	411.5	13.5	219	309
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	213.5	318.5	45.5	249.5	339.5
FABR-180-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~C7 are motor(metric standard) specific dimenisions, which could be customized.

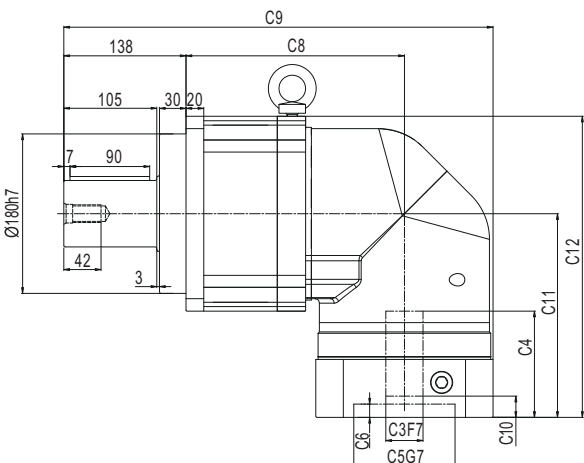
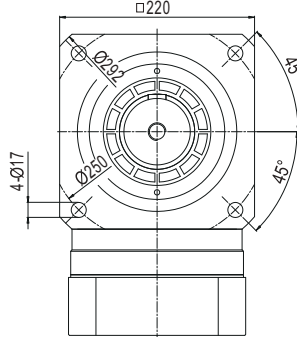
产品尺寸 / product dimension

FABR-220-L1

输入端/INPUT

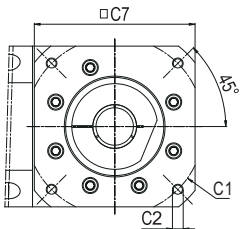


输出端/ OUTPUT

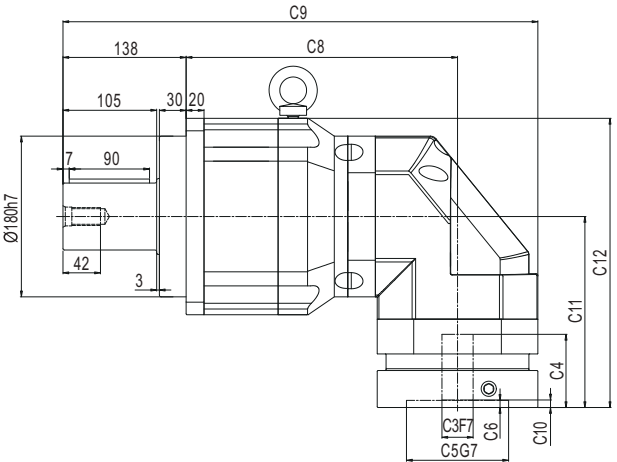
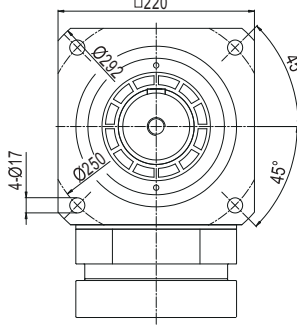


FABR-220-L2

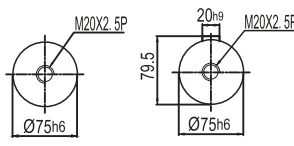
输入端/ INPUT



输出端 /OUTPUT



输出轴径/Output Diameter



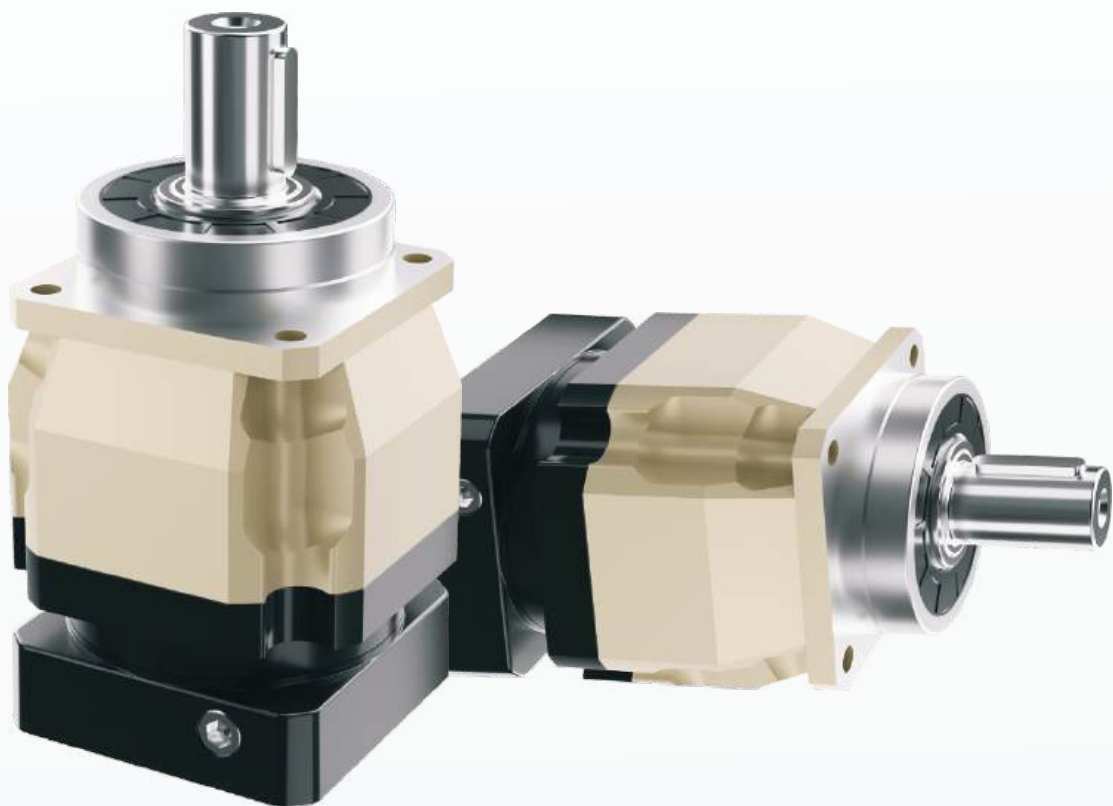
轴型式 S1
shaft

轴型式 S2
shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FABR-220-L1	Ø200	4-M12x30	Ø35,Ø42	120	Ø114.3	15	200	258.5	484.5	22.5	230	340
	Ø215	4-M12x28	Ø38	110	Ø180	8	200	258.5	484.5	12.5	220	330
	Ø235	4-M12x28	Ø42,Ø55	120	Ø200	10	220	258.5	494.5	24	230	340
FABR-220-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	316	532	45.5	249.5	359.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	316	538	13.5	219	329
	Ø235	4-M12x30	Ø42	117.5	Ø200	10	220	316	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~C7 are motor(metric standard) specific dimenisions, which could be customized.

品质源三凯 口碑自然来



型号说明 / model description

FAF

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090

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010

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S2

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P2

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马达

减速机型式 Model :
FAF-060/FAF-075/FAF-090
FAF-100/FAF-140/FAF180

输出轴型式选择 Output type:
S1 : 平滑直轴 shaft
S2 : 附件直轴 shaft with key

马达安装尺寸:
Motor mounting dimension

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
Ratio : Single-stage : 3,4,5,6,7,8,10,14,20
Dual-stages : 12,15,20,25,30,35,40,50,60,70
80,100,120,140,160,200

背隙 Backlash : P0 : 超精密背隙 Ultra-precision backlash
P1 : 精密背隙 Precision backlash
P2 : 标准背隙 Standard backlash

选用范例: FAF-090-010-S2-P2-19-70-90-M6-45

SUCCESS BREEDS
SUCCESS

FAF
SERIES

PRECISION PLANETARY
GEAR BOX

精密行星减速机

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技术参数 / technical specification

规格 Model	级数 Stage	减速比 ¹ Ratio	FAF060	FAF075	FAF075A	FAF100	FAF100A	FAF140	FAF140A	FAF180
额定输出力矩T _{2N} Rated output torque	1	3	55	130	—	208	—	342	—	588
		4	50	140	—	290	—	542	—	1,050
		5	60	160	—	330	—	650	—	1,200
		6	55	150	—	310	—	600	—	1,100
		7	50	140	—	300	—	550	—	1,100
		8	45	120	—	260	—	500	—	1,000
	2	10	40	100	—	230	—	450	—	900
		15	55	130	130	208	208	342	342	588
		20	50	140	140	290	290	542	542	1,050
		25	60	160	160	330	330	650	650	1,200
		30	55	160	160	330	330	650	650	1,200
		35	50	160	160	330	330	650	650	1,200
		40	45	120	120	260	260	500	500	1,000
		50	60	160	160	330	330	650	650	1,200
		60	55	150	150	310	310	600	600	1,100
		70	50	140	140	300	300	550	550	1,100
		80	45	120	120	260	260	500	500	1,000
		100	40	100	100	230	230	450	450	900
最大输出力矩T _{2B} /Max. output torque	Nm	1.2	3~100	3倍额定输出力矩 3 times the rated output torque						
额定输入转速n ₁ /Rated input speed	rpm	1.2	3~100	5,000	4,000	4,000	4,000	3,000	3,000	3,000
最大输入转速n _{1S} /Max. input speed	rpm	1.2	3~100	10,000	8,000	8,000	8,000	6,000	6,000	6,000
超精密背隙 P0/Ultra-precision backlash	arcmin	1	3~10	—	≤1	≤1	≤1	≤1	≤1	≤1
		2	3~100	—	—	≤3	≤3	≤3	≤3	≤3
精密背隙 P1/Precision backlash	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/Precision backlash	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/Torsional rigidity	Nm/arcmin	1.2	3~100	7	14	14	25	25	50	145
容许径向力F _{2R} / Allowable radial force	N	1.2	3~100	1,400	4,100	4,100	9,200	9,200	14,000	18,000
容许轴向力F _{2S} / Allowable radial force	N	1.2	3~100	1,000	3,300	3,300	5,220	5,220	10,800	13,000
容许轴向力F _{2S} / Allowable radial force	N	1.2	3~100	1,100	3,700	3,700	5,800	5,800	11,400	19,500
使用寿命/Life time	h	1.2	3~100	30,000 (S5工作制)						
效率η / Efficiency	%	1	3~10	≥97%						
		2	12~100	≥94%						
重量/Weight	kg	1	3~10	1.3	3.7	—	7.8	—	14.5	—
		2	12~100	1.9	41	41	9	9	17.5	33
使用温度/Operating temperature	°C	1.2	3~100	-10°C~+90°C						
润滑/lubrication		1.2	3~100	合成润滑油脂 Synthetic lubricating grease						
防护等级/Ingress protection		1.2	3~100	IP65						
安装方向/Mount position		1.2	3~100	任意方向 Any direction						
噪音值(n ₁ =3000rpm)/Noise level	dB	1.2	3~100	≤58	≤60	≤60	≤63	≤63	≤65	≤67

减速机转动惯量 Gearbox moment of inertia

规格 Model	级数 Stage	减速比 ¹ Ratio	FAF060	FAF075	FAF075A	FAF100	FAF100A	FAF140	FAF140A	FAF180
转动惯量J ₁ Moment of inertia	1	3	0.16	0.61	—	3.25	—	9.21	—	28.98
		4	0.14	0.48	—	2.74	—	7.54	—	23.67
		5	0.13	0.47	—	2.71	—	7.42	—	23.29
		6	0.13	0.45	—	2.65	—	7.25	—	22.75
		7	0.13	0.45	—	2.62	—	7.14	—	22.48
		8	0.13	0.44	—	2.58	—	7.07	—	22.59
	2	10	0.13	0.44	—	2.57	—	7.03	—	22.51
		15	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42
		20	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42
		25	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42
		30	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42
		35	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42
		40	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42
		50	0.03	0.13	0.13	0.44	0.44	2.57	2.57	7.03
		60	0.03	0.13	0.13	0.44	0.44	2.57	2.57	7.03
		70	0.03	0.13	0.13	0.44	0.44	2.57	2.57	7.03
		80	0.03	0.13	0.13	0.44	0.44	2.57	2.57	7.03
		100	0.03	0.13	0.13	0.44	0.44	2.57	2.57	7.03

1. 减速比 Ratio(i=N_{in}/N_{out})

* 连续运转降低使用寿命二分之一。

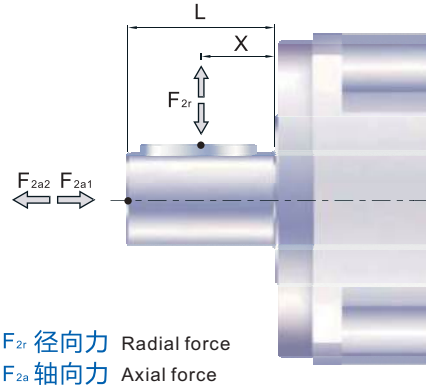
The lifetime will be shortened by half under continuous operation.

2. 输出转速 100rpm 时，作用于输出轴中心位置。

When the output speed is 100rpm, it applies on the center of the output shaft.

减速机输出轴之容许径向力及轴向力

ALLOWABLE RADIAL AND AXIAL FORCES ON THE OUTPUT SHAFT OF THE GEARBOX



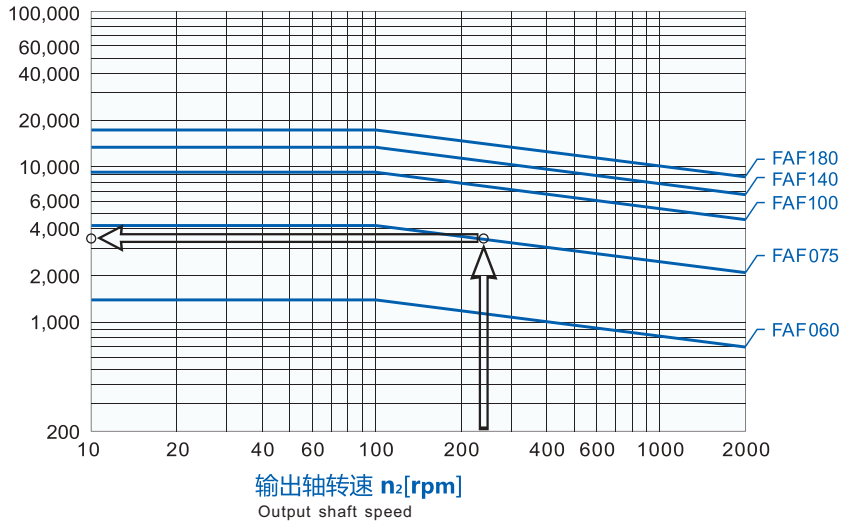
减速机输出轴所能承受的最大径向力和轴向力，取决于内部支撑轴承的设计。采用大跨距设计，选择大承载力轴承，获得最大的径向力和轴向力承载能力。

The permitted radial and axial loads on output shaft depends on the design of the gearbox supporting bearing. Large span design and large bearing capacity are adopted, to obtain the maximim bearing capacity of radial and axial loads.

F_{2r} 径向力 Radial force
F_{2a} 轴向力 Axial force

容许径向力 F_{2R}[N] 施力于轴中心位置

Permissible radial force F_{2R} [N] apply force to the center of the shaft

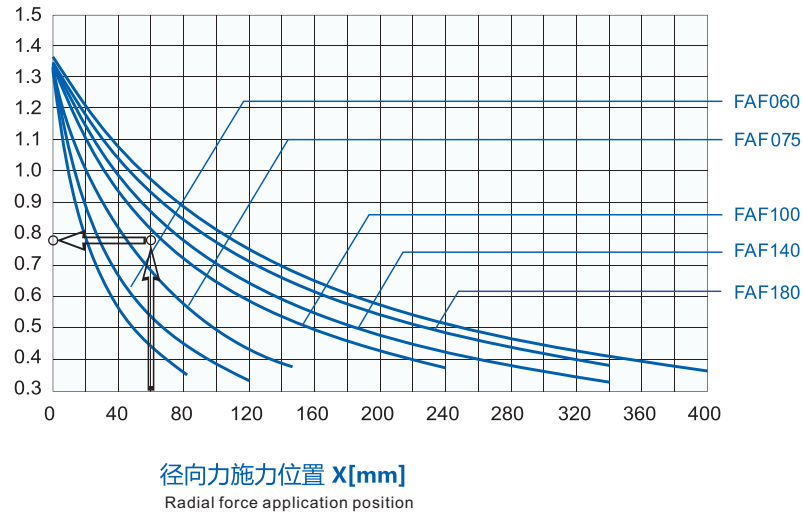


当径向力F_{2r}作用在轴中心位置即X=1/2xL，各种规格减速机在不同输出转速的运行时，所能承受之容许径向力F_{2R}，请参考左图

When the radial force F_{2r} is applied to the center of the shaft, i.e. X=1/2xL, the allowable radial force F_{2R} that can be withstood by ifferent specifications of reducers under different output speeds is refer to the left picture

位置负荷系数 K_s

Positional load coefficient



当径向力F_{2r}作用点不在轴中心位置时，越靠近减速机即X<1/2xL，所能承受之容许径向力越大；越远离减径力则越小。请参考左图，按减速机规格及径向力作用点位置X值，查出位置负荷系数K_s，代入下列公式，求出容许径向力：

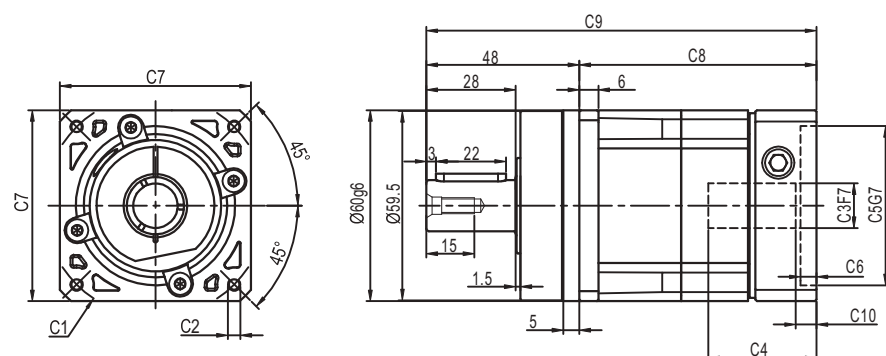
When the radial force F_{2r} is not in the center of the shaft, the closer to the gearbox, that is, X<1/2xL, the allowable radial force that can be borne becomes larger, and the farther away from the reducer, i.e., X>1/2xL, the allowable force that can be borne becomes smaller.

F'_{2R} = K_s × F_{2R}

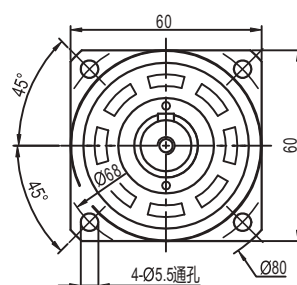
产品尺寸 / product dimension

FAF-060-L1

输入端/ INPUT

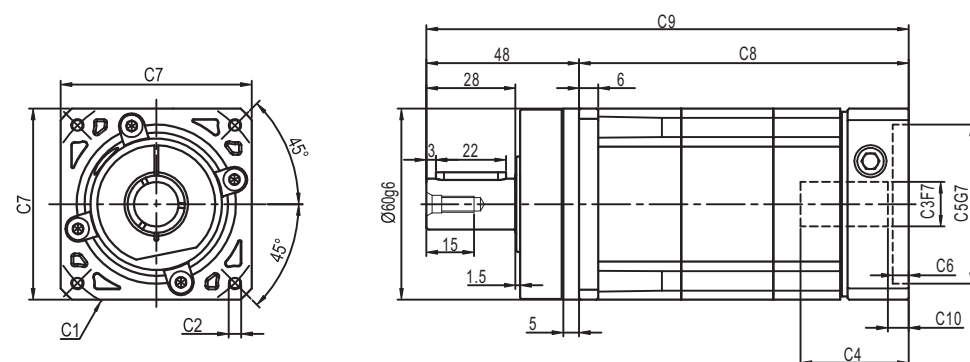


输出端/OUTPUT

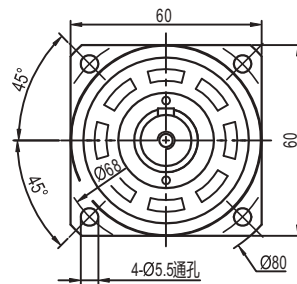


FAF-060-L2

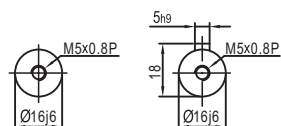
输入端/ INPUT



输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAF-060-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	74.5	122.5	6.5
FAF-060-L2								103.5	151.5	6.5
FAF-060-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	74.5	122.5	6.5
FAF-060-L2								103.5	151.5	6.5
FAF-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	81	129	12
FAF-060M1-L2								110	158	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~C7 are motor(metric standard) specific dimenisions, which could be customized.

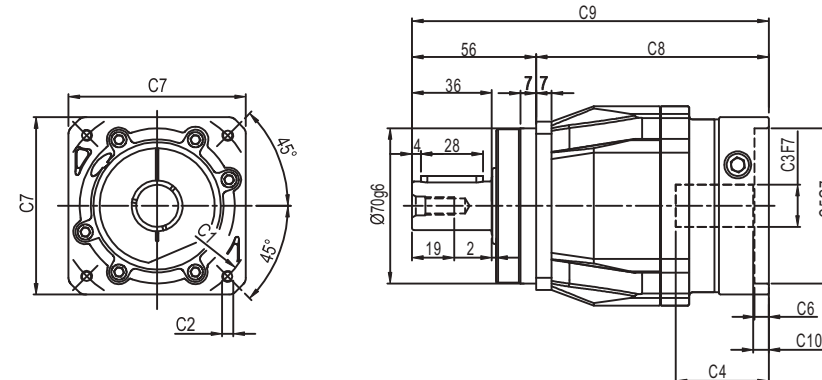
*M1:极限孔(版本号)

*M1:Limit hole (Version number)

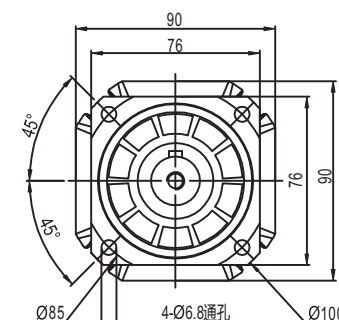
产品尺寸 / product dimension

FAF-075-L1

输入端/INPUT

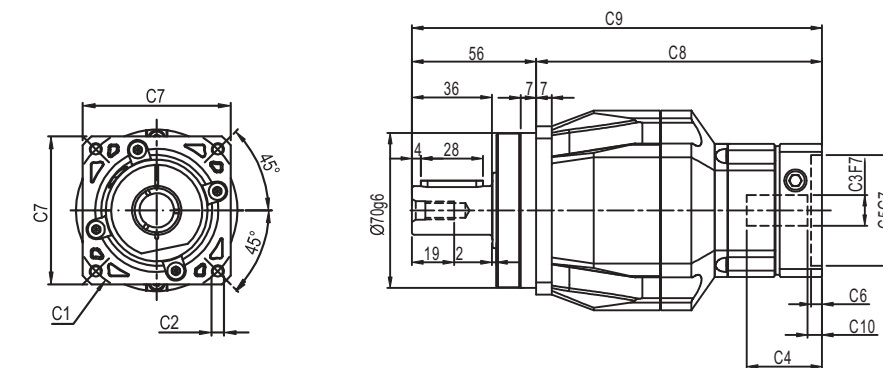


输出端/ OUTPUT

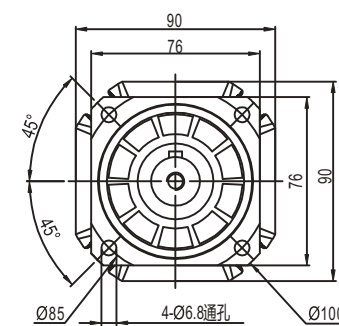


FAF-075-L2

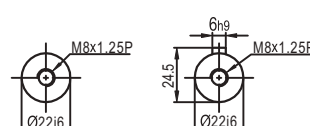
输入端/ INPUT



输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAF-075-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	105	161	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	105	161	7
FAF-075M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	120.5	176.5	17.5
	Ø145	4-M8x20	Ø19,Ø22Ø24	59	Ø110	11	130	123	178	20
FAF-075-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	129	185	5.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	129	185	5.5
FAF-075M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	135.5	191.5	12
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	135.5	191.5	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~C7 are motor(metric standard) specific dimenissions, which could be customized.

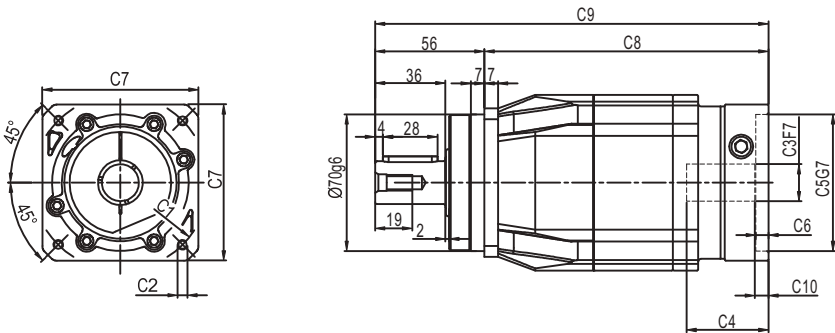
*M1:极限孔(版本号)

*M1:Limit hole (Version number)

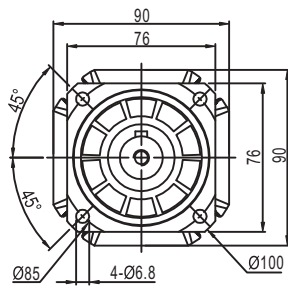
产品尺寸 / product dimension

FAF-075A-L2

输入端 / INPUT

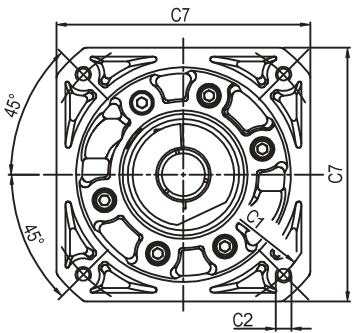


输出端 / OUTPUT

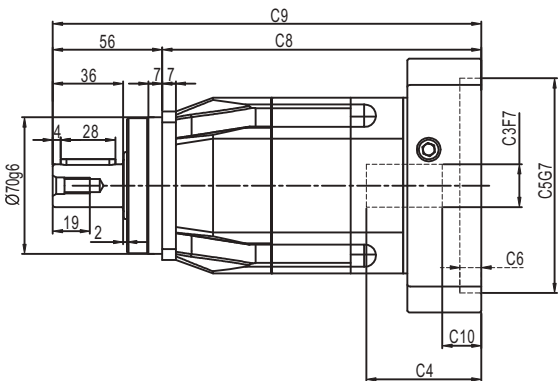


FAF-075A-L2

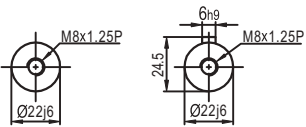
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

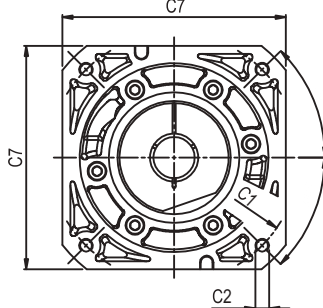
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FAF-075A-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	156.5	249.5	7	96	141
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	156.5	249.5	6	96	141
FAF-075AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	156.5	254.5	16.5	117.5	162.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	10	130	156.5	269.5	19	120	165

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

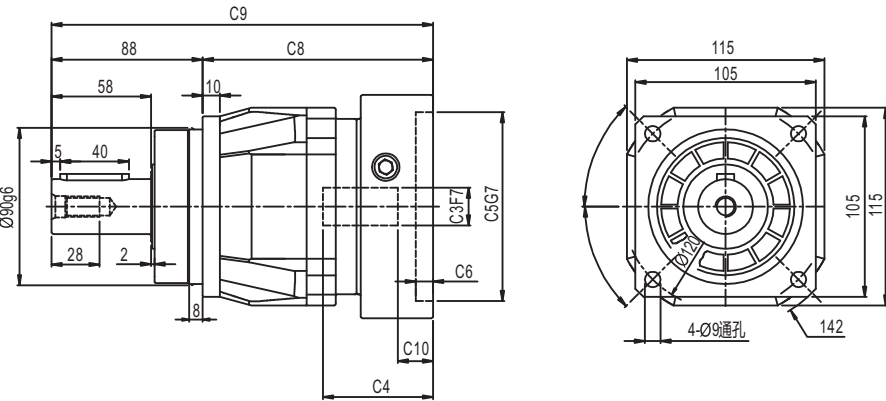
产品尺寸 / product dimension

FAF-100-L1

输入端 / INPUT

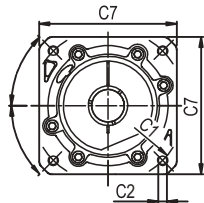


输出端/OUTPUT

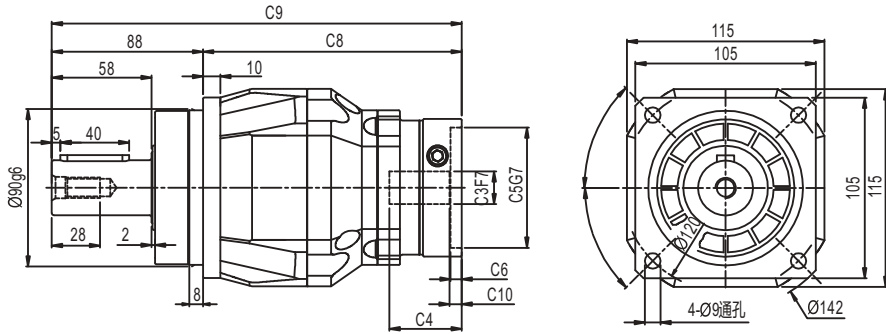


FAF-100-L2

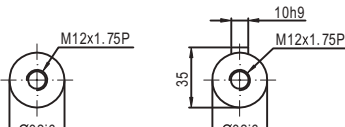
输入端 / INPUT



输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

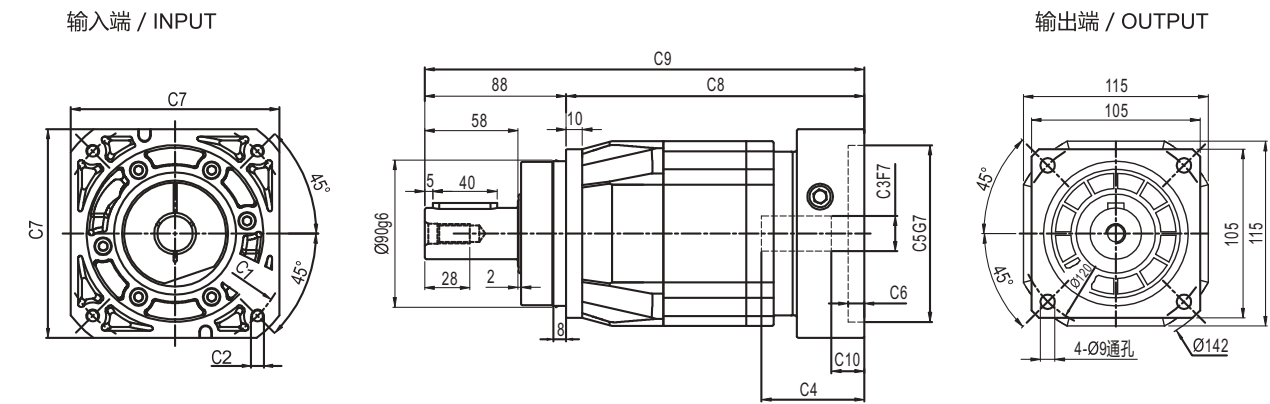
轴型式 S2
shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAF-100-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	134	222	19.5
FAF-100M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	151.5	239.5	28
FAF-100-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	150.5	238.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	150.5	238.5	6
FAF-100M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	166	254	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	168.5	256.5	19

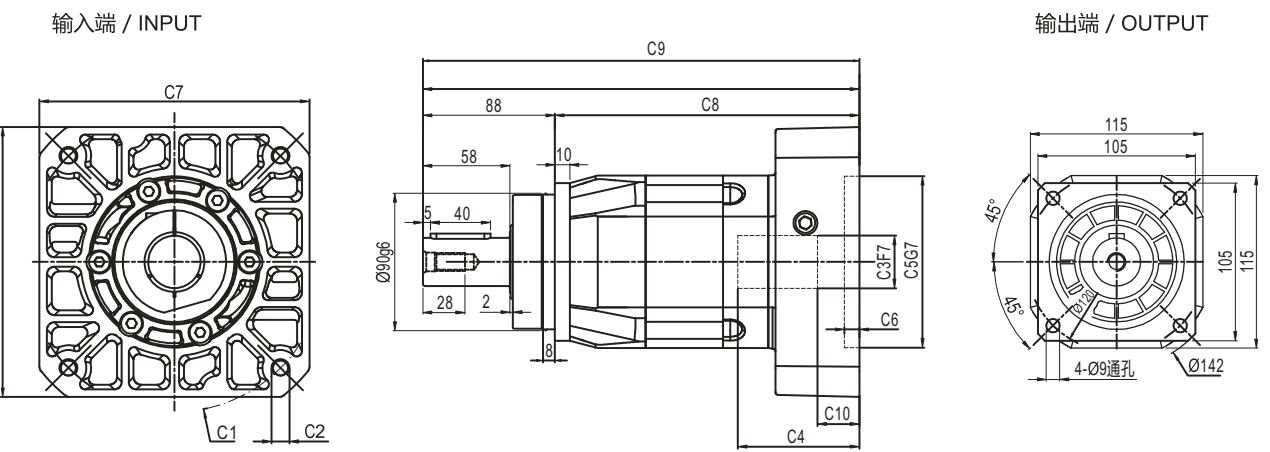
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

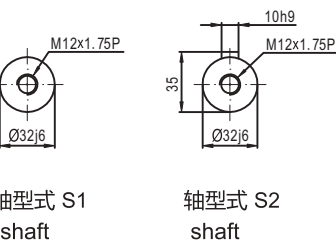
FAF-100A-L2



FAF-100A-L2



输出轴径/Output Diameter

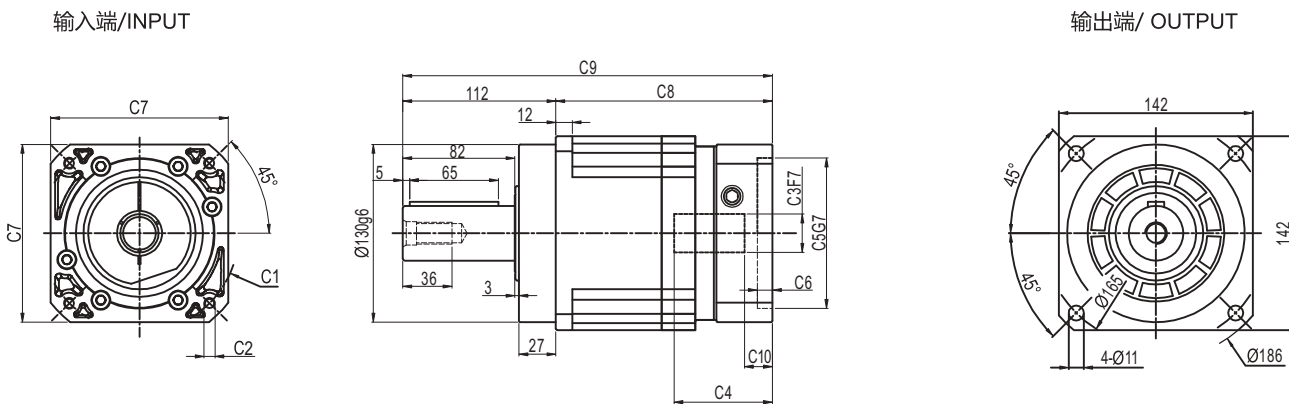


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAF-100A-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	185.5	273.5	19.5
FAF-100AM1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	203	291	28

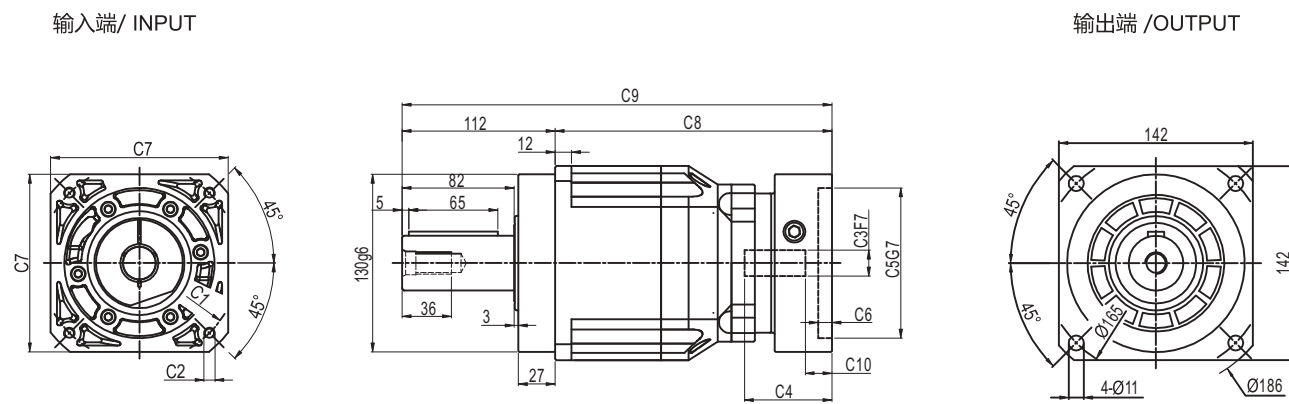
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

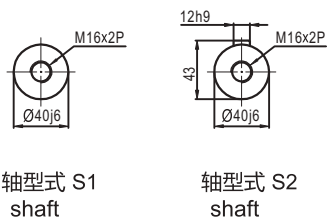
FAF-140-L1



FAF-140-L2



输出轴径/Output Diameter

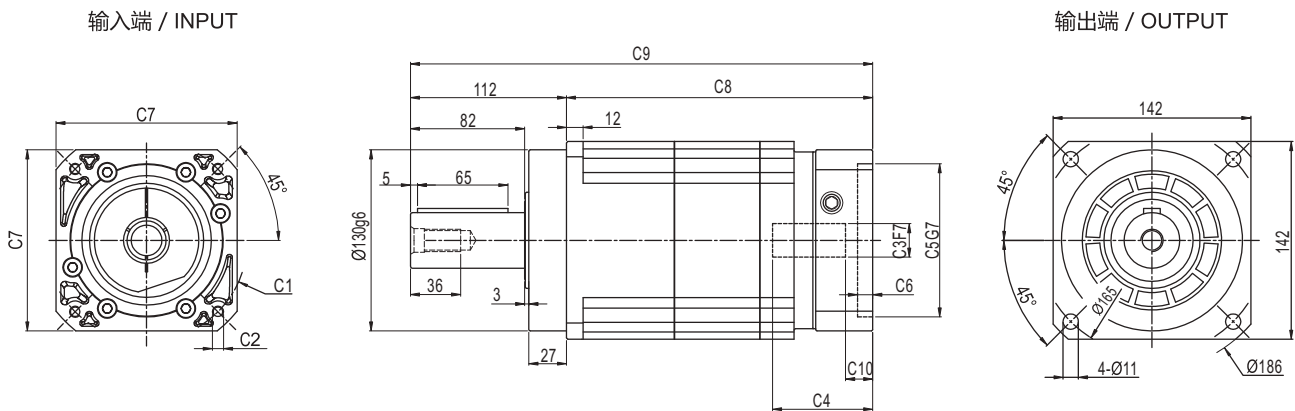


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAF-140-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	158.5	270.5	19.5
FAF-140-L2	Ø200	4-M12x20	Ø35	81.5	Ø114.3	8	180	168.5	280.5	25
FAF-14M1-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	202.5	314.5	19.5
FAF-14M1-L2	Ø200	4-M12x20	Ø35	81	Ø114.3	10	180	220	332	28

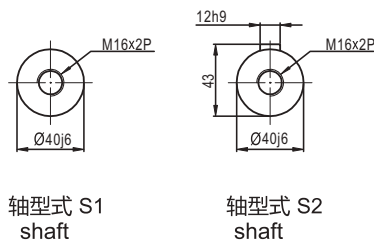
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

FAF-140A-L2



输出轴径/Output Diameter

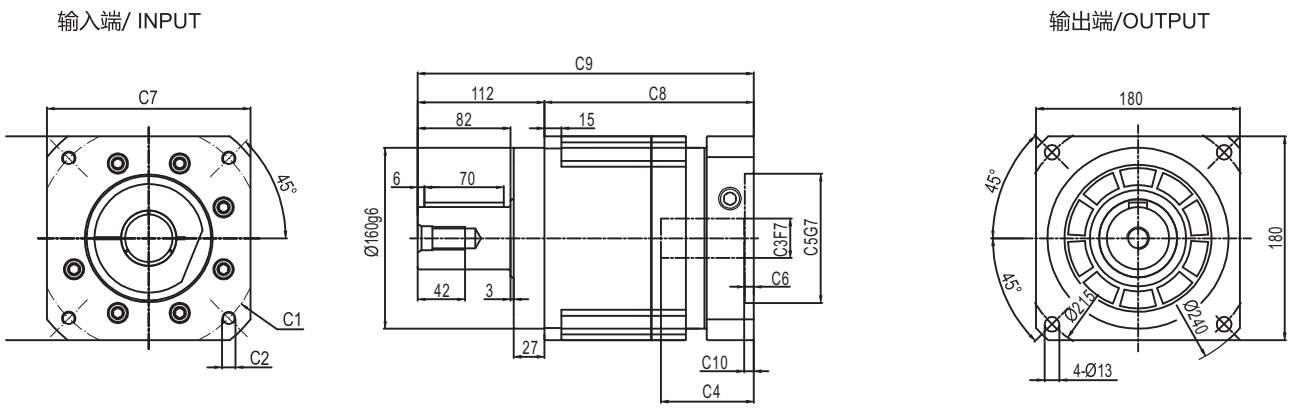


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAF-140A-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	220	332	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	230	342	25

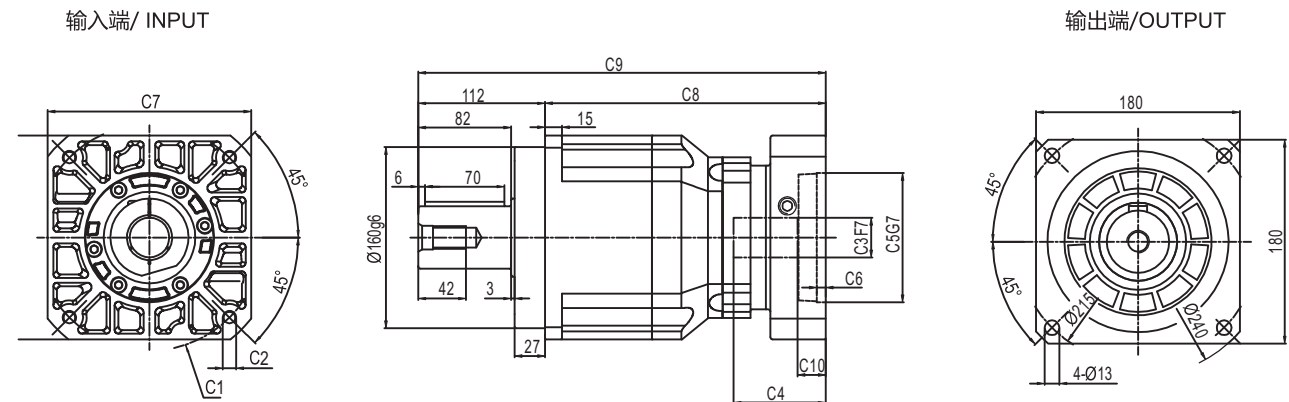
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7are motor(metric standard) specific dimenisions, which could be customized.

产品尺寸 / product dimension

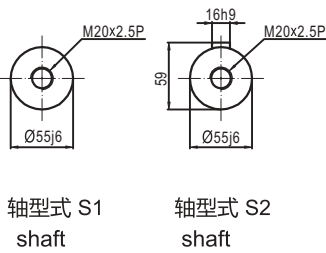
FAF-180-L1



FAF-180-L2



输出轴径/Output Diameter



尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FAF-180-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	185	297	8.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	220.5	332.5	45.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	190	302	13.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	200	220.5	332.5	45.5
FAF-180-L2	Ø145	4-M8x20	Ø22,Ø2	72	Ø110	11	130	238	350	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	248	360	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 dimenisions, which could be customized.

品质源三凯 口碑自然来



型号说明 / model description

FAFR

—

090

—

010

—

S2

—

P2

—

马达

减速机型式 Model :
FAFR-060/FAFR-075
FAFR-100/FAFR-140/FAFR180

输出轴型式选择 Output type:
S1 : 平滑直轴 shaft
S2 : 附件直轴 shaft with key

马达安装尺寸:
Motor mounting dimension

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
Ratio : Single-stage : 3,4,5,6,7,8,10,14,20
Dual-stages : 12,15,20,25,30,35,40,50,60,70
80,100,120,140,160,200

背隙 Backlash : P0 : 超精密背隙 Ultra-precision backlash
P1 : 精密背隙 Precision backlash
P2 : 标准背隙 Standard backlash

选用范例: FAFR-090-010-S2-P2-19-70-90-M6-45

SUCCESS BREEDS
SUCCESS

FAFR
SERIES

PRECISION PLANETARY
GEAR BOX

精密行星减速机

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技术参数 / technical specification

规格 Model		级数 Stage	减速比 ¹ Ratio	FAFR060	FAFR075	FAFR075A	FAFR100	FAFR100A	FAFR140	FAFR140A	FAFR180
额定输出力矩T _{2N} Rated output torque	Nm	1	3	55	130	—	208	—	342	—	588
			4	50	140	—	290	—	542	—	1,050
			5	60	160	—	330	—	650	—	1,200
			6	55	150	—	310	—	600	—	1,100
			7	50	140	—	300	—	550	—	1,100
			8	50	140	—	290	—	542	—	1,000
			10	60	160	—	330	—	650	—	520
			14	50	140	—	300	—	550	—	1,100
			20	40	100	—	230	—	450	—	520
		2	12	55	130	130	208	208	342	342	588
			15	55	130	130	208	208	342	342	588
			20	50	140	140	290	290	542	542	1,050
			25	60	160	160	330	330	650	650	1,200
			30	55	130	130	208	208	342	342	1,200
			35	60	160	160	330	330	650	650	1,200
			40	50	140	140	290	290	542	542	1,200
			50	60	160	160	330	330	650	650	1,200
			60	55	150	150	310	310	600	600	1,200
			70	60	160	160	330	330	650	650	1,200
			80	50	140	140	290	290	542	542	1,200
			100	60	160	160	330	330	650	650	1,200
			120	—	150	150	310	310	600	600	1,100
			140	—	140	140	300	300	550	550	1,100
			160	—	120	120	260	260	500	500	1,000
			200	—	100	100	230	230	450	450	520
最大输出力矩T _{2S} /Max. output torque	Nm	1,2	3~200	3倍额定输出力矩 3 times the rated output torque							
额定输入转速n ₁ /Rated input speed	rpm	1,2	3~200	5,000	4,000	4,000	4,000	4,000	3,000	3,000	3,000
最大输入转速n _{1S} /Max. input speed	rpm	1,2	3~200	10,000	8,000	8,000	8,000	8,000	6,000	6,000	6,000
超精密背隙 P0/Ultra-precision backlash	arcmin	1	3~20	—	≤2	≤2	≤2	≤2	≤2	≤2	≤2
		2	12~200	—	≤4	≤4	≤4	≤4	≤4	≤4	≤4
精密背隙 P1/Precision backlash	arcmin	1	3~20	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4
		2	12~200	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7
标准背隙 P2/Precision backlash	arcmin	1	3~20	≤6	≤6	≤7	≤6	≤7	≤6	≤7	≤6
		2	12~200	≤9	≤9	≤9	≤9	≤9	≤9	≤9	≤9
扭转刚性/Torsional rigidity	Nm/arcmin	1,2	3~200	7	14	14	25	25	50	50	145
容许径向力F _{2R} / Allowable radial force	N	1,2	3~200	1,400	4,100	4,100	9,200	9,200	14,000	14,000	18,000
容许轴向力F _{2S} / Allowable radial force	N	1,2	3~200	1,000	3,300	3,300	5,220	5,220	10,800	10,800	13,000
容许轴向力F _{2S} / Allowable radial force	N	1,2	3~200	1,100	3,700	3,700	5,800	5,800	11,400	11,400	19,500
使用寿命/Life time	hr	1,2	3~200	30,000 (S5工作制)							
效率η /Efficiency	%	1	3~20	≥95%							
		2	12~200	≥92%							
重量/Weight	kg	1	3~20	2.1	6.4	—	13	—	24.5	—	51
		2	12~200	2.5	7.8	8.9	14.2	18.2	27.5	34.3	54
使用温度/Operating temperature	°C	1,2	3~200	-10°C~+90°C							
润滑/lubrication		1,2	3~200	合成润滑油脂 Synthetic lubricating grease							
防护等级/Ingress protection		1,2	3~200	IP65							
安装方向/Mount position		1,2	3~200	任意方向 Any direction							
噪音值(n=3000rpm)/Noise level	dB	1,2	3~200	≤63	≤65	≤65	≤68	≤68	≤70	≤70	≤72

减速机转动惯量 Gearbox moment of inertia

规格 Model		级数 Stage	减速比 ¹ Ratio	FAFR060	FAFR075	FAFR075A	FAFR100	FAFR100A	FAFR140	FAFR140A	FAFR180
转动惯量J ₁ Moment of inertia	kg · cm ²	1	3~10	0.35	2.25	—	6.84	—	23.4	—	68.9
			14	0.07	1.87	—	6.25	—	21.8	—	65.6
			20	0.07	1.87	—	6.25	—	21.8	—	65.6
		2	15	—	—	—	—	—	—	—	—
			20	—	—	—	—	—	—	—	—
			25~100	0.09	0.35	2.25	2.25	6.89	6.84	23.4	23.4
			120~200	—	0.31	1.87	1.87	6.25	6.25	21.8	21.8

1.减速比 Ratio(i=N_{in}/N_{out})

* 连续运转降低使用寿命二分之一。

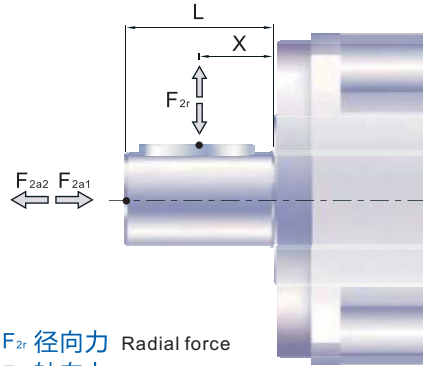
The lifetime will be shortened by half under continuous operation.

2.输出转速 100rpm 时，作用于输出轴中心位置。

When the output speed is 100rpm, it applies on the center of the output shaft.

减速机输出轴之容许径向力及轴向力

ALLOWABLE RADIAL AND AXIAL FORCES ON THE OUTPUT SHAFT OF THE GEARBOX



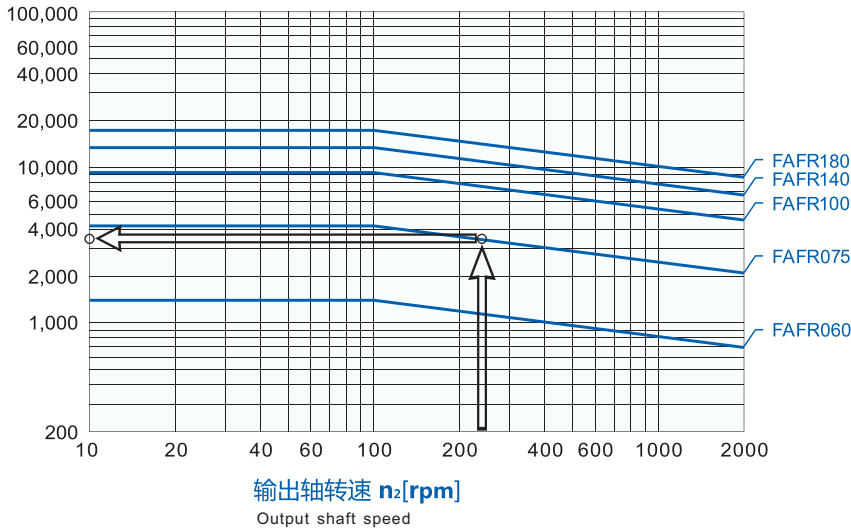
F_{2r} 径向力 Radial force
F_{2a} 轴向力 Axial force

减速机输出轴所能承受的最大径向力和轴向力，取决于内部支撑轴承的设计。采用大跨距设计，选择大承载力轴承，获得最大的径向力和轴向力承载能力。

The permitted radial and axial loads on output shaft depends on the design of the gearbox supporting bearing. Large span design and large bearing capacity are adopted, to obtain the maximym bearing capacity of radial and axial loads.

容许径向力 F_{2R}[N] 施力于轴中心位置

Permissible radial force F_{2R}【N】 apply force to the center of the shaft

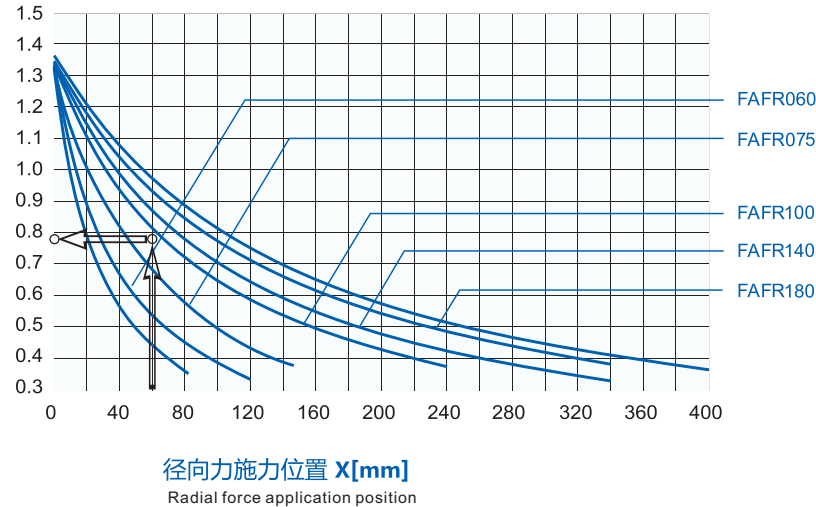


当径向力F_{2r}作用在轴中心位置即X=1/2xL，各种规格减速机在不同输出转速的运行时，所能承受之容许径向力F_{2R}，请参考左图

When the radial force F_{2r} is applied to the center of the shaft, i.e. X=1/2xL, the allowable radial force F_{2R} that can be withstood by ifferent specifications of reducers nder different output speeds is refer to the left picture

位置负荷系数 K_b

Positional load coefficient



当径向力F_{2r}作用点不在轴中心位置时，越靠近减速机即X<112xL，所能承受之容许径向力越大；越远离减径向力则越小，请参考左图，按减速机规格及径向力作用点位置X值，查出位置负荷系数K_b，代入下列公式，求出容许径向力：

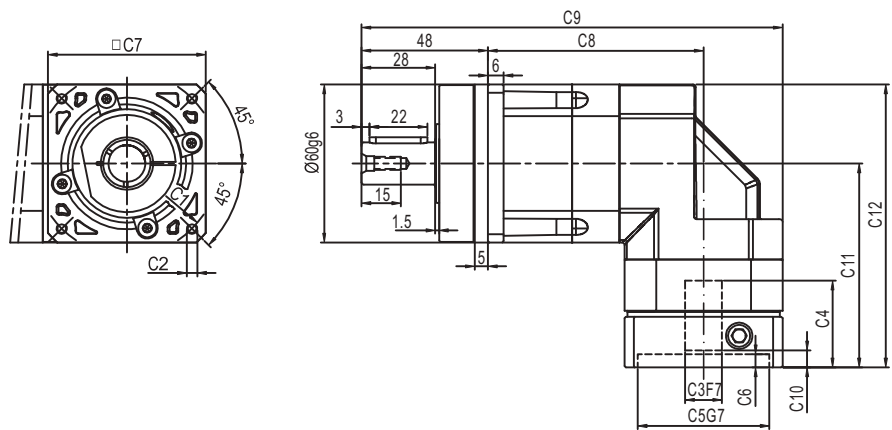
When the radial force F_{2r} is not in the center of the shaft, the closer to the gearbox, that is, X<1/2xL, the allowable radial force that can be borne becomes larger, and the farther away from the reducer, i.e., X>1/2xL, the allowable force that can be borne becomes smaller.

F' _{2R} = K_b × F_{2R}

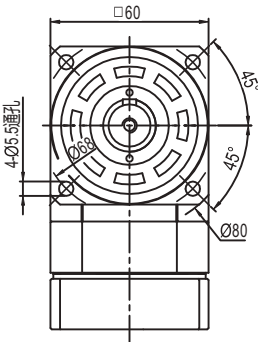
产品尺寸 / product dimension

FAFR-060-L1

输入端/INPUT

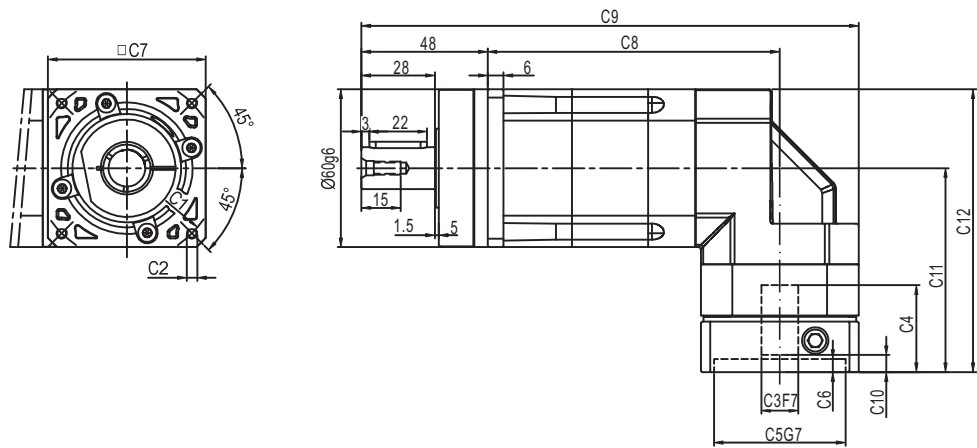


输出端/ OUTPUT

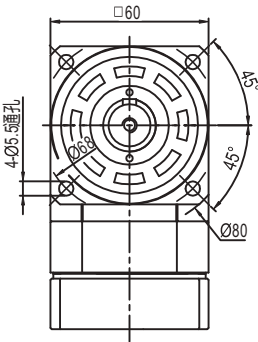


FAFR-060-L2

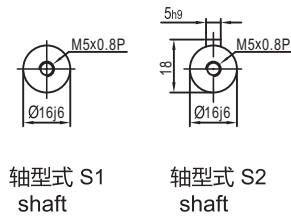
输入端/ INPUT



输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

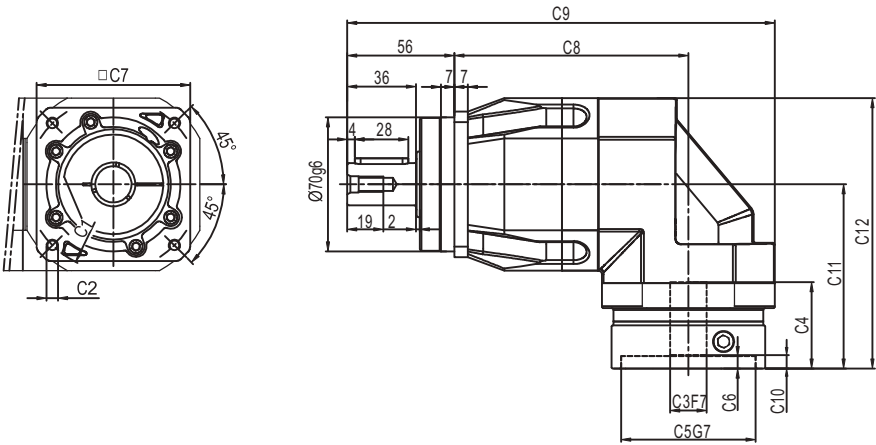
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FAFR-060-L1	Ø66.7	4-M4x10	Ø8	33	Ø38	5	60	82 111	160 189	5.5	77.5	107.5
FAFR-060-L2	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	82 111	160 189	5.5	77.5	107.5
FAFR-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	82 111	170 199	12	87	117
FAFR-060M1-L2												

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

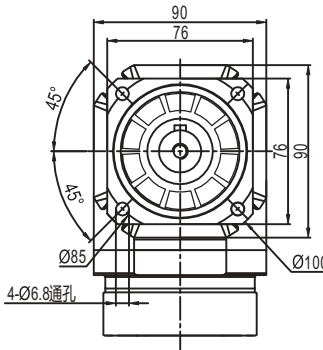
产品尺寸 / product dimension

FAFR-075-L1

输入端/ INPUT

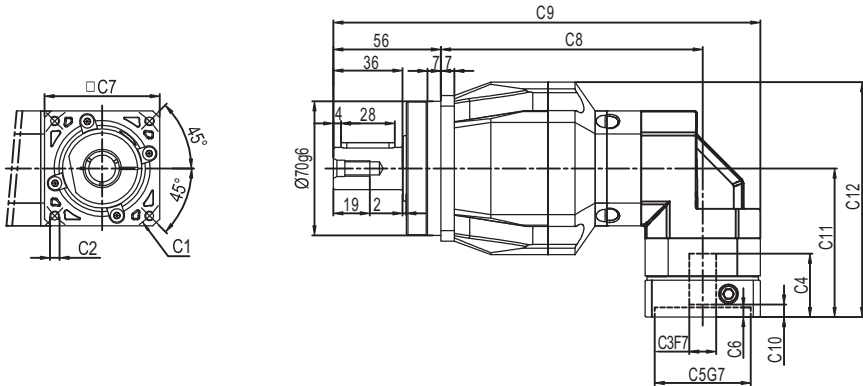


输出端/OUTPUT

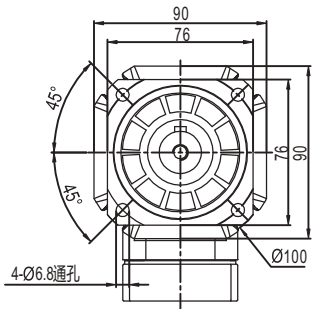


FAFR-075-L2

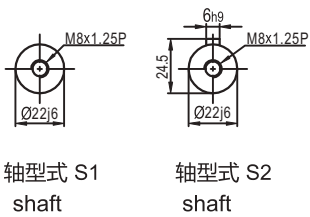
输入端/ INPUT



输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

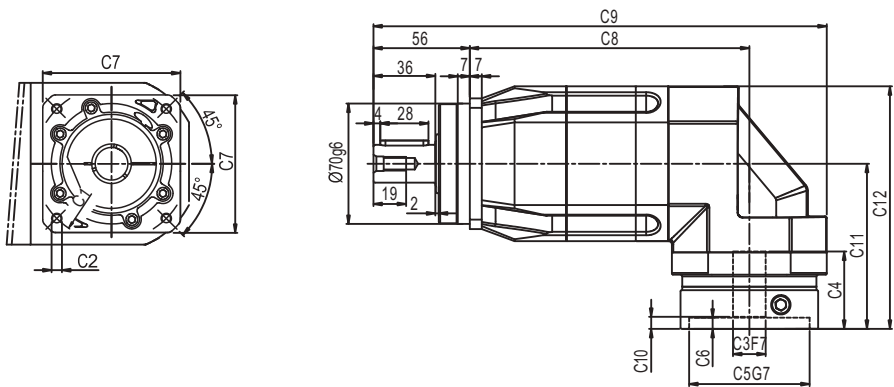
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FAFR-075-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	122	223	7	96	141
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	122	223	6	96	141
FAFR-075M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	122	228	16.5	117.5	162.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	122	243	19	120	165
FAFR-075-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	136.5	222.5	5.5	77.5	122.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	136.5	222.5	5.5	77.5	122.5
FAFR-075M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	136.5	232.5	12	87	132
	Ø100	4-M6x14	Ø16	42.5	Ø80	6.5	86	136.5	235.5	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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

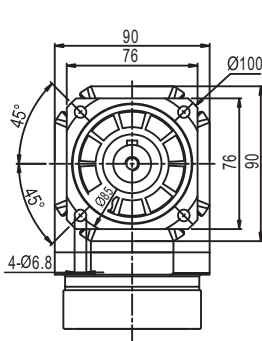
产品尺寸 / product dimension

FAFR-075A-L2

输入端 / INPUT

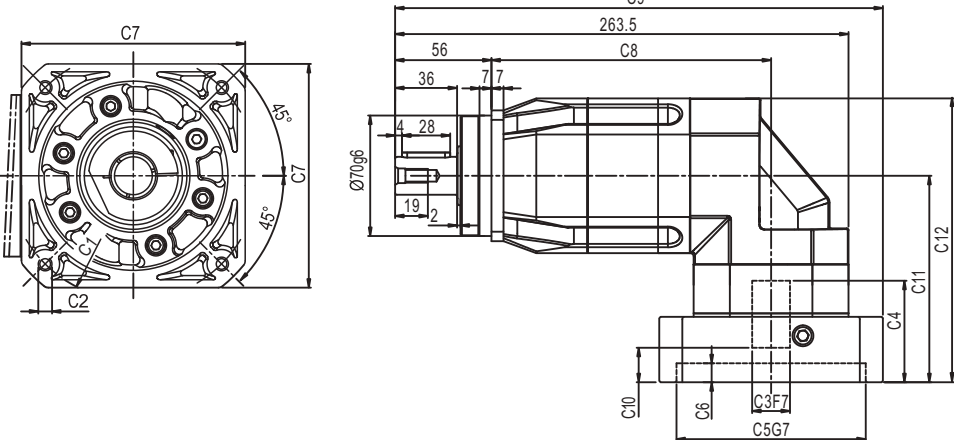


输出端 / OUTPUT

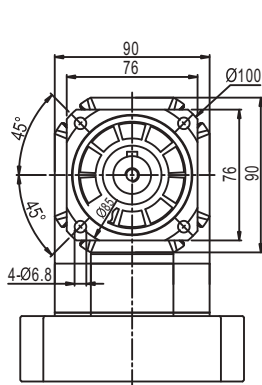


FAFR-075A-L2

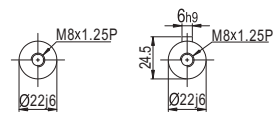
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

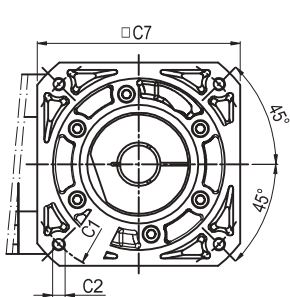
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FAFR-075A-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	156.5	249.5	7	96	141
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	156.5	249.5	6	96	141
FAFR-075AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	156.5	254.5	16.5	117.5	162.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	10	130	156.5	269.5	19	120	165

*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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

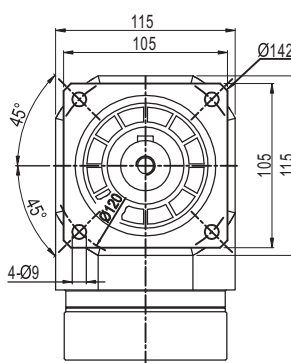
产品尺寸 / product dimension

FAFR-100-L1

输入端/INPUT

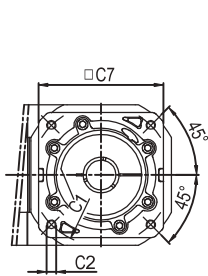


输出端 / OUTPUT

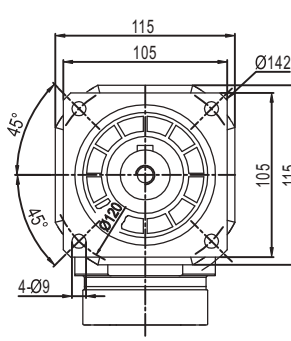


FAFR-100-L2

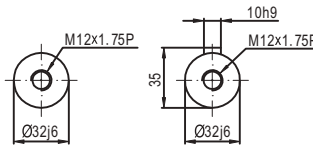
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

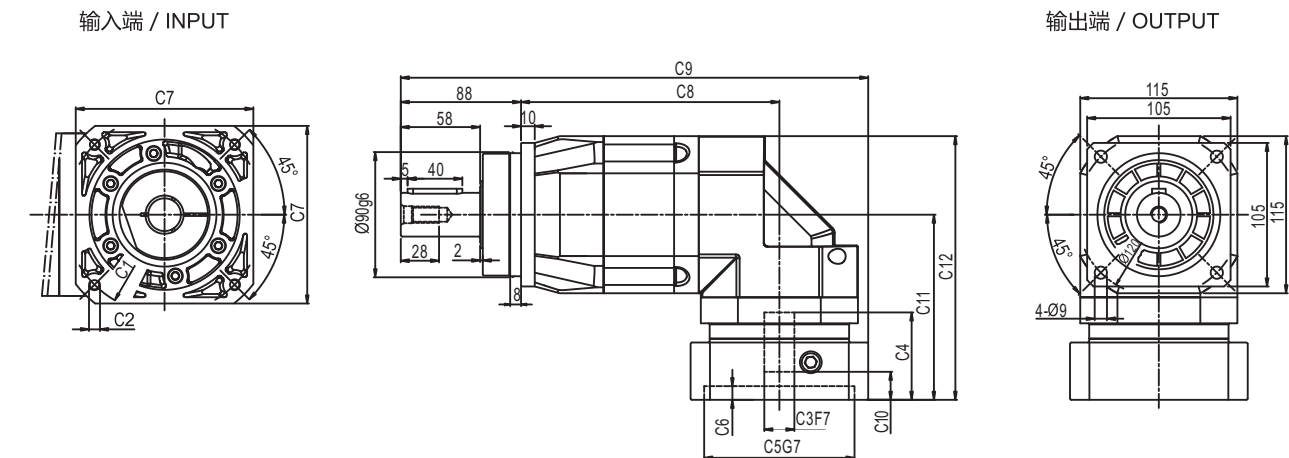
轴型式 S2
shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FAFR-100-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	137.5	290.5	195	135.5	193
FAFR-100M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	137.5	315.5	28	152.5	210
	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	167.5	300.5	7	96	153.5
FAFR-100-L2	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	167.5	300.5	6	96	153.5
	Ø115	4-M8x20	19,Ø22	56.5	Ø95	8	100	167.5	305.5	16.5	117.5	175
FAFR-100M1-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	167.5	320.5	19	120	177.5

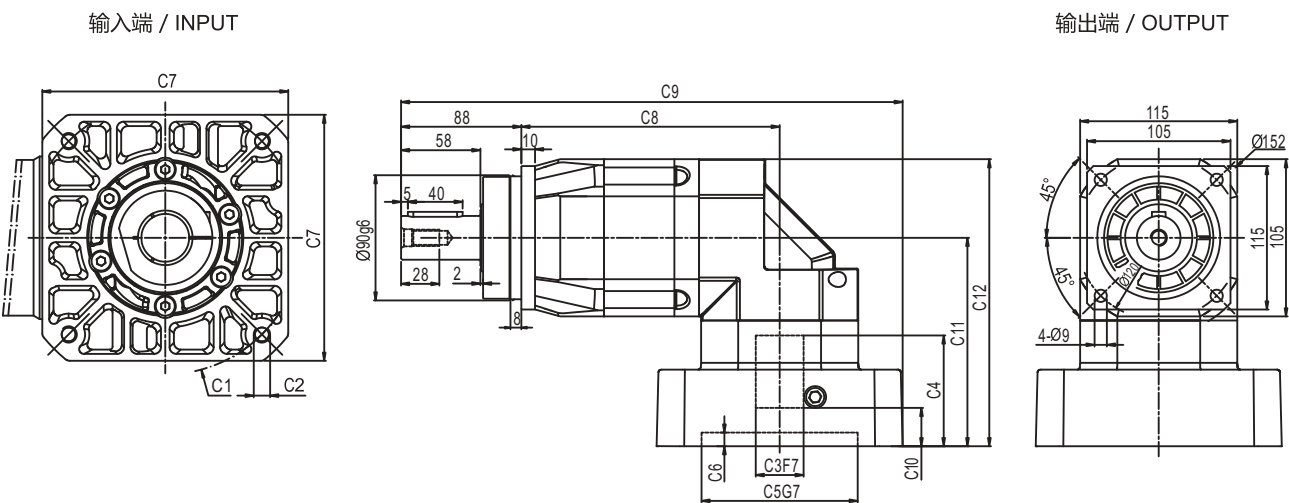
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

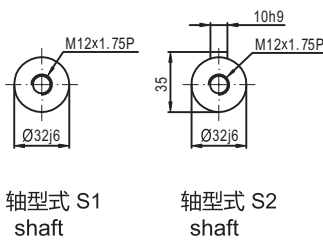
FAFR-100A-L2



FAFR-100A-L2



输出轴径/Output Diameter

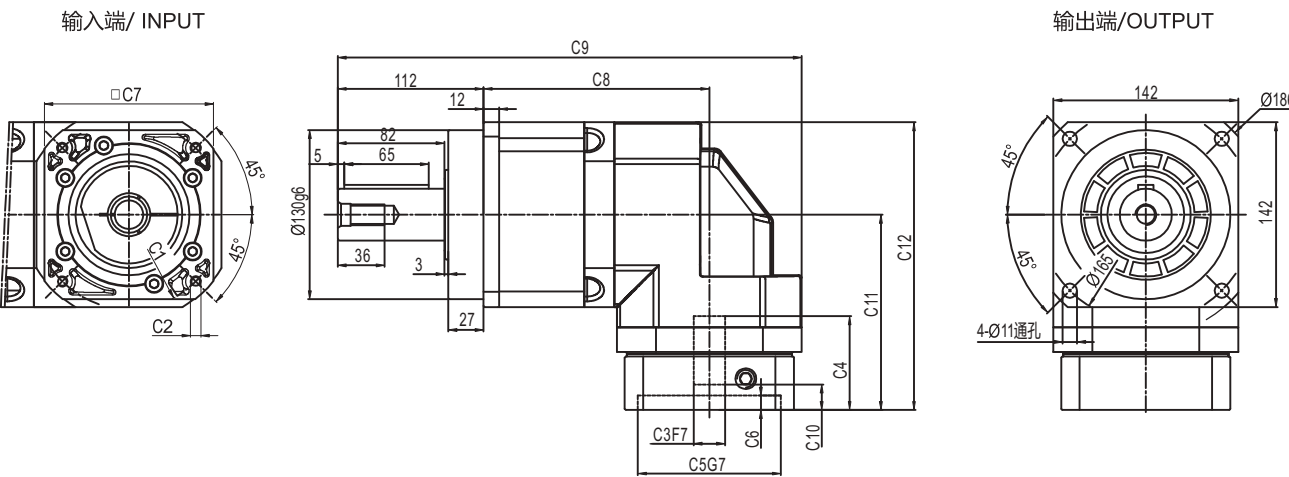


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FAFR-100A-L2	Ø145	4-M8×20	Ø19,Ø22,Ø24	64	Ø110	10	130	137.5	290.5	195	135.5	193
FAFR-100AM1-L2	Ø200	4-M12×28	Ø35	81	Ø114.3	10	180	137.5	315.5	28	152.5	210

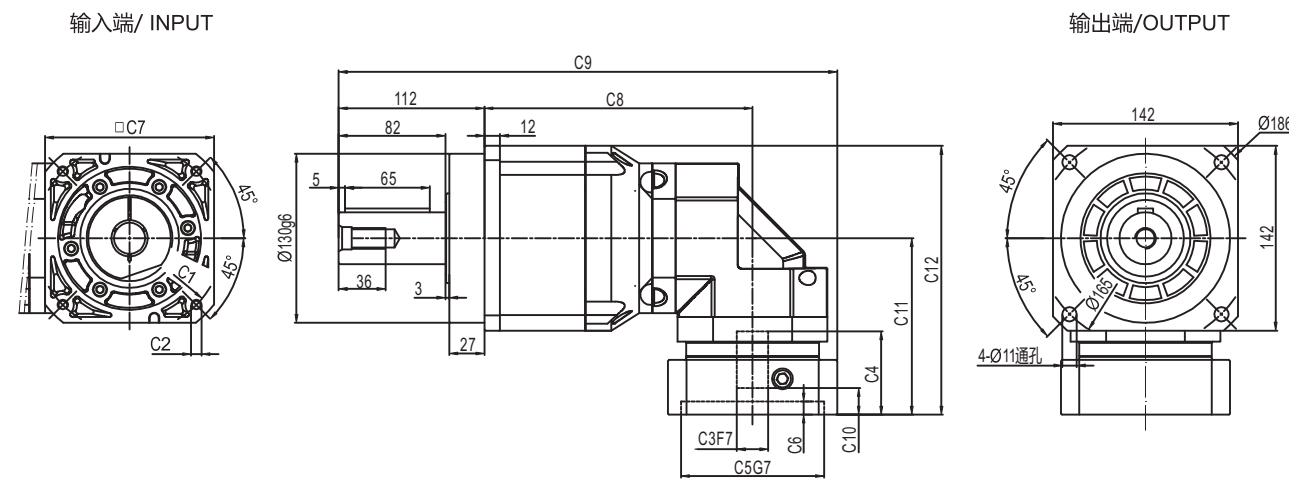
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

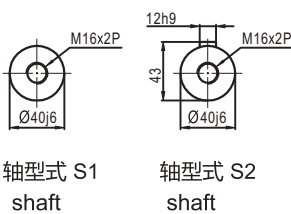
FAFR-140-L1



FAFR-140-L2



输出轴径/Output Diameter



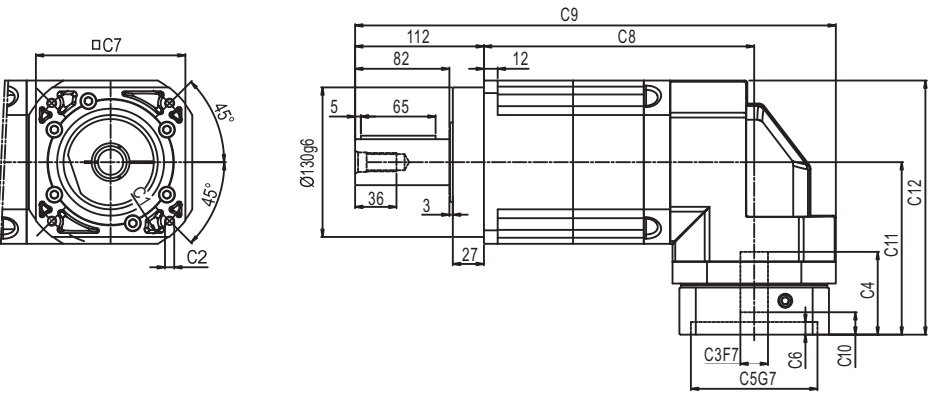
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FAFR-140-L1	Ø145	4-M8×20	Ø19,Ø22	72	Ø110	11	130	173.5	356.5	19.5	150	221
FAFR-140-L2	Ø200	4-M12×28	Ø35	82	Ø114.3	8	180	173.5	375.5	25	160	231
FAFR-140M1-L2	Ø200	4-M12×28	Ø35	81	Ø114.3	10	180	206	408	28	52.5	23.5

*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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

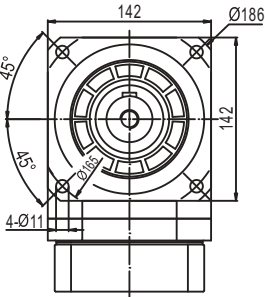
产品尺寸 / product dimension

FAFR-140A-L2

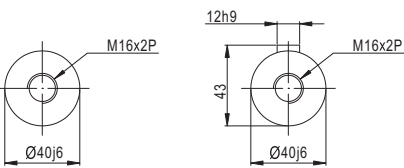
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

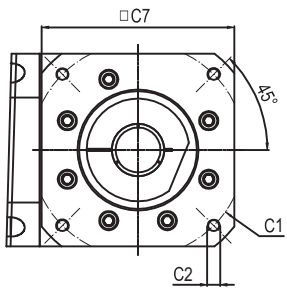
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FAFR-140A-L2	Ø145	4-M8x20	Ø22, Ø24	72	Ø110	11	130	235	418	19.5	150	221
	Ø200	4-M12x28	Ø35	81	Ø114.3	8	180	235	437	25	160	231

*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~C7 are motor(metric standard) specific dimensions, which could be customized.

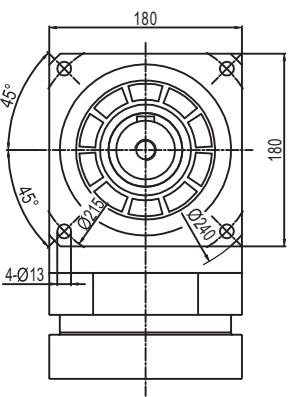
产品尺寸 / product dimension

FAFR-180-L1

输入端/INPUT

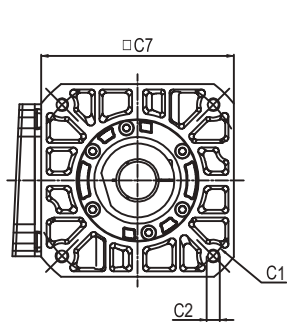


输出端/ OUTPUT

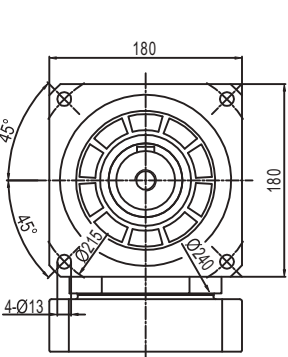


FAFR-180-L2

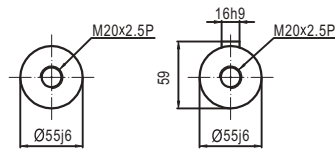
输入端/ INPUT



输出端 /OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FAFR-180-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	217.5	419.5	8.5	214	304
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	217.5	419.5	45.5	249.5	339.5
	Ø215	4-M8x20	Ø38	87	Ø180	8	192	217.5	425.5	13.5	219	309
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	217.5	439.5	45.5	249.5	339.5
FAFR-180-L2	Ø145	4-M8x20	Ø19, Ø24	72	Ø110	11	130	246	383	19.5	150	240
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	253	408	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~C7 are motor(metric standard) specific dimensions, which could be customized.

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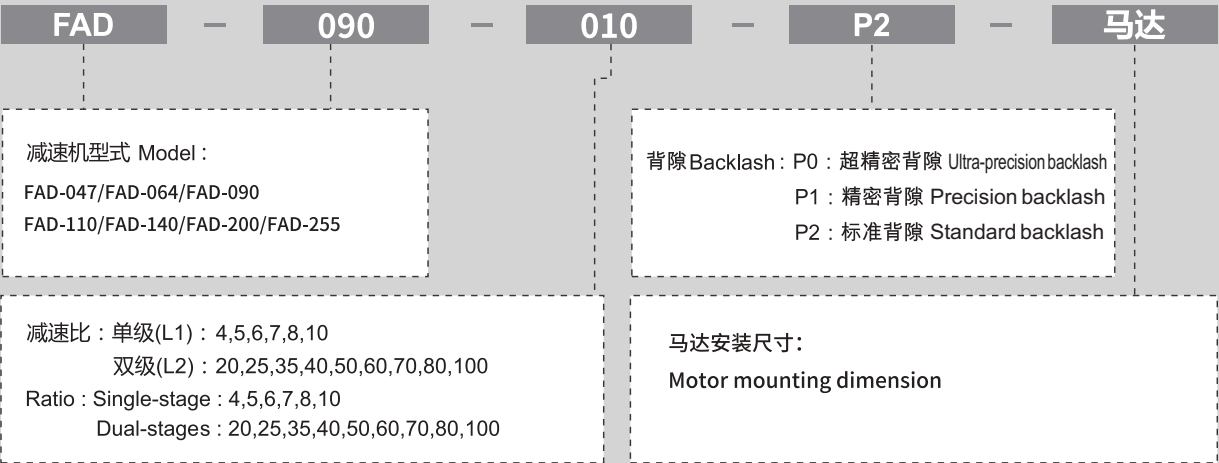
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SKGR三凯

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

FAD系列

型号说明 / model description



选用范例: FAD-090-010-P2-19-70-90-M6-42

技术参数 / technical specification

规格 Model	级数 Stage	减速比 ¹ Ratio	FAD047	FAD064	FAD090	FAD090A	FAD110	FAD110A	FAD140	FAD140A	FAD200	FAD255
额定输出力矩T _{2N} Rated output torque	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	130	270	270	560	560	1,100	1,700
		25	22	60	160	160	330	330	650	650	1,200	2,000
		35	22	60	160	160	330	330	650	650	1,200	2,000
		40	22	48	130	130	270	270	560	560	1,100	1,700
		50	22	60	160	160	330	330	650	650	1,200	2,000
		60	-	55	150	150	310	310	600	600	1,100	1,900
		70	19	50	140	140	300	300	550	550	1,100	1,800
		80	-	45	120	120	260	260	500	500	1,000	1,600
		100	14	40	100	100	230	230	450	450	900	1,500
最大输出力矩T _{2s} /Max.output torque	Nm	1,2	4~100	3倍额定输出力矩 3 times the rated output torque								
额定输入转速n ₁ /Rated input speed	rpm	1,2	4~100	5,000	5,000	4,000	4,000	4,000	3,000	3,000	3,000	2,000
最大输入转速n _{1s} /Max.input speed	rpm	1,2	4~100	10,000	10,000	8,000	8,000	8,000	6,000	6,000	6,000	4,000
超精密背隙 P0/Ultra-precision backlash	arcmin	1	4~100	-	-	≤1	≤1	≤1	≤1	≤1	≤1	≤1
		2	4~10	-	-	-	-	≤3	≤3	≤3	≤3	≤3
精密背隙 P1/Precision backlash	arcmin	1	20~100	≤3	≤3	≤3	≤5	≤3	≤5	≤3	≤5	≤3
		2	4~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤5
标准背隙 P2/Precision backlash	arcmin	1	20~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	4~10	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7
扭转刚性/Torsional rigidity	Nm/arcmin	1,2	20~100	7	13	31	31	82	82	151	151	440
最大弯曲力矩M _{max} ² /Maximum bending moment	Nm	1,2	4~100	42.5	125	235	235	430	430	1,300	1,300	3,064
容许径向力F _{rs} /Allowable radial force	N	1,2	4~100	1,080	2,110	2,310	2,310	4,800	4,800	6,200	6,200	5,450
使用寿命/Life time	hr	1,2	4~100	20,000 *								
效率η/Efficiency	%	1	4~10	≥97%								
		2	20~100	≥94%								
重量/Weight	kg	1	4~10	0.7	1.2	3.0	-	5.6	-	11.9	-	31.6
		2	20~100	1.0	1.6	3.7	4.2	7.3	7.84	15.9	16.6	36.9
使用温度/Operating temperature	°C	1,2	4~100	-10°C~+90°C								
润滑/lubrication		1,2	4~100	合成润滑油脂 Synthetic lubricating grease								
防护等级/Ingress protection		1,2	4~100	IP65								
安装方向/Mount position		1,2	4~100	任意方向 Any direction								
噪音值 (n=3000rpm)/Noise level	dB	1,2	4~100	≤56	≤58	≤60	≤60	≤63	≤63	≤65	≤65	≤70

减速机转动惯量 Gearbox moment of inertia

规格 Model	级数 Stage	减速比 ¹ Ratio	FAD047	FAD064	FAD090	FAD090A	FAD110	FAD110A	FAD140	FAD140A	FAD200	FAD255
转动惯量J _i Moment of inertia	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	0.47	2.71	2.71	7.42	7.42	23.29
		25	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
		35	0.03	0.13	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
		40	0.03	0.13	0.13	0.44	0.44	2.57	2.57	7.03	7.03	22.51
		50	0.03	0.13	0.13	0.44	0.44	2.57	2.57	7.03	7.03	22.51
		60	-	0.13	0.13	0.44	0.44	2.57	2.57	2.57	-	-
		70	0.03	0.13	0.13	0.13	0.44	0.44	2.57	7.03	7.03	22.51
		80	-	0.13	0.13	0.13	0.44	0.44	2.57	2.57	-	-
		100	0.03	0.13	0.13	0.13	0.44	0.44	2.57	7.03	7.03	22.51

1. 减速比 Ratio ($i = \frac{N_{in}}{N_{out}}$)

* 连续运转降低使用寿命二分之一。

The lifetime will be shortened by half under continuous operation.

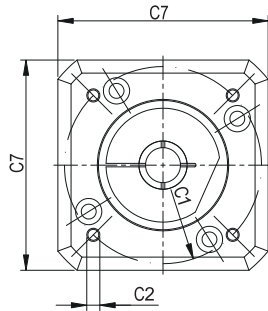
2. 输出转速 100rpm 时，作用于输出轴中心位置。

When the output speed is 100rpm, it applies on the center of the output shaft.

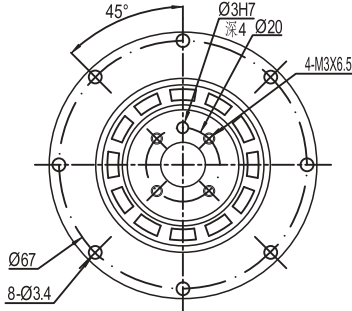
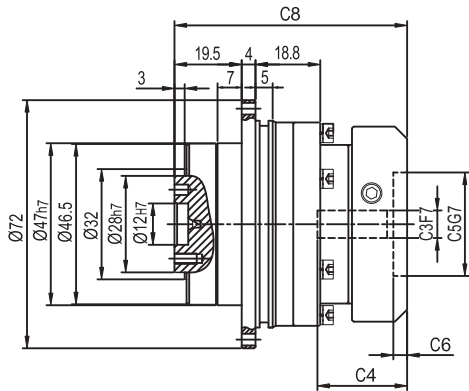
产品尺寸 / product dimension

FAD-047-L1

输入端/ INPUT

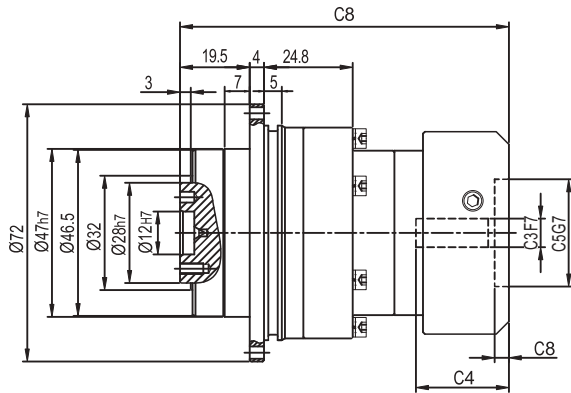
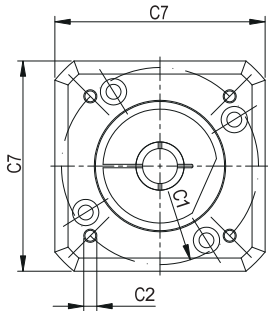


输出端/OUTPUT

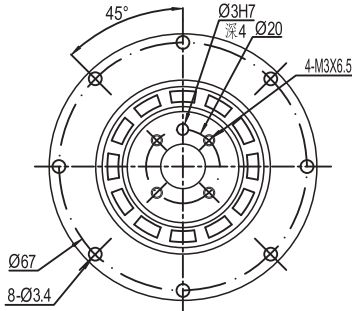


FAD-047-L2

输入端/ INPUT



输出端/OUTPUT



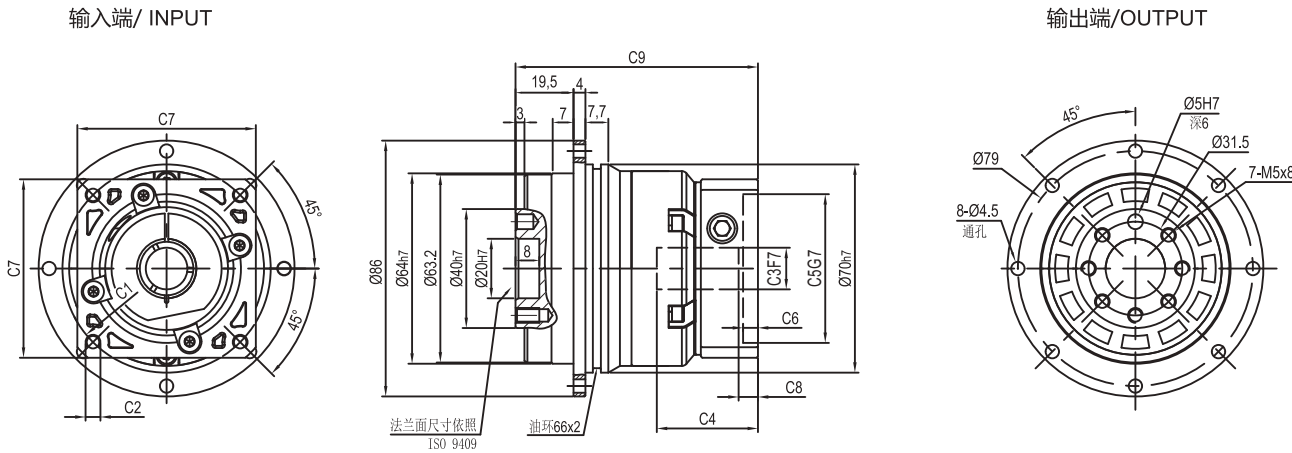
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8
FAD-047-L1	Ø46	4-M4x10	Ø8	26	Ø30	4	42	67.5
	Ø45	4-M3x8						
FAD-047-L2	Ø46	4-M4x10	Ø8	26	Ø30	4	42	92
	Ø45	4-M3x8						

*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。

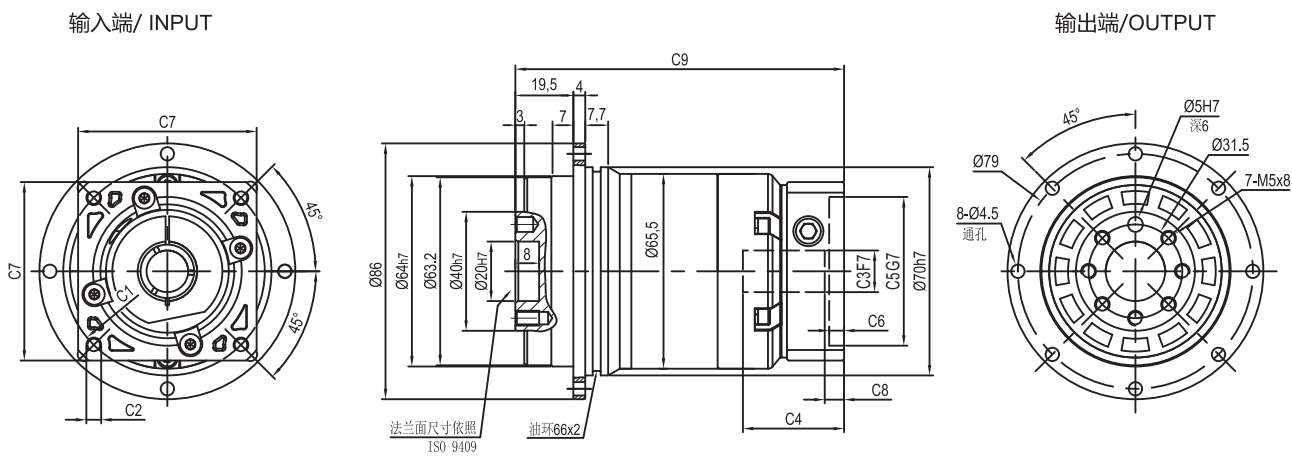
*C1 ~ C7 are motor(metric standard) specific dimenisions, which could be customised.

产品尺寸 / product dimension

FAD-064-L1



FAD-064-L2

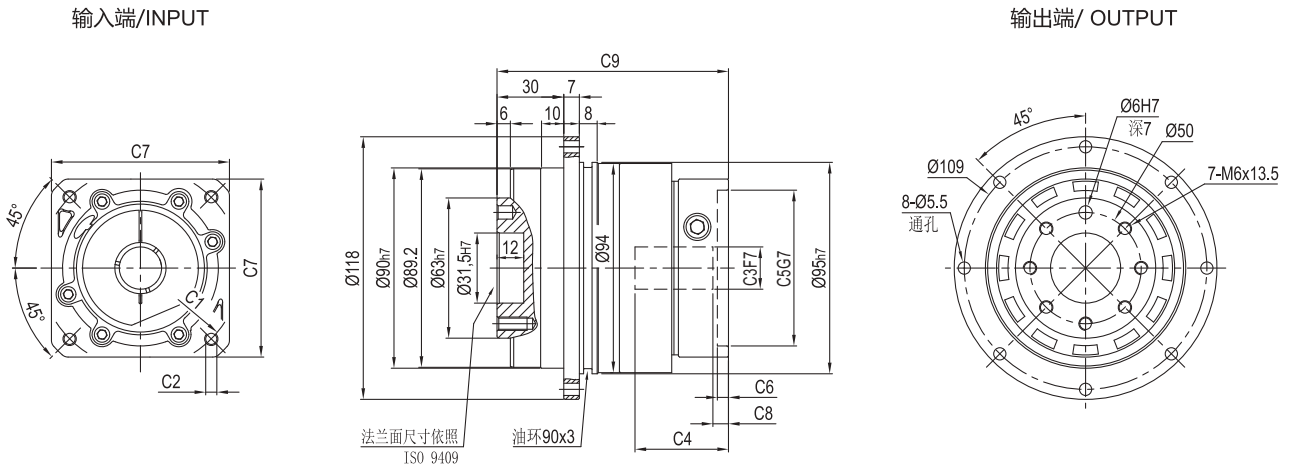


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-064-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	5.5	81.5
FAD-064-L2									110.5
FAD-064-L1	Ø70	4-M4x10, 4-M5x12	Ø11, Ø14	34	Ø50	5	60	5.5	81.5
FAD-064-L2									110.5
FAD-064M1-L1	Ø90	4-M5x12, 4-M6x14	Ø19	42	Ø70	6.5	80	12	88
FAD-064M1-L2									117

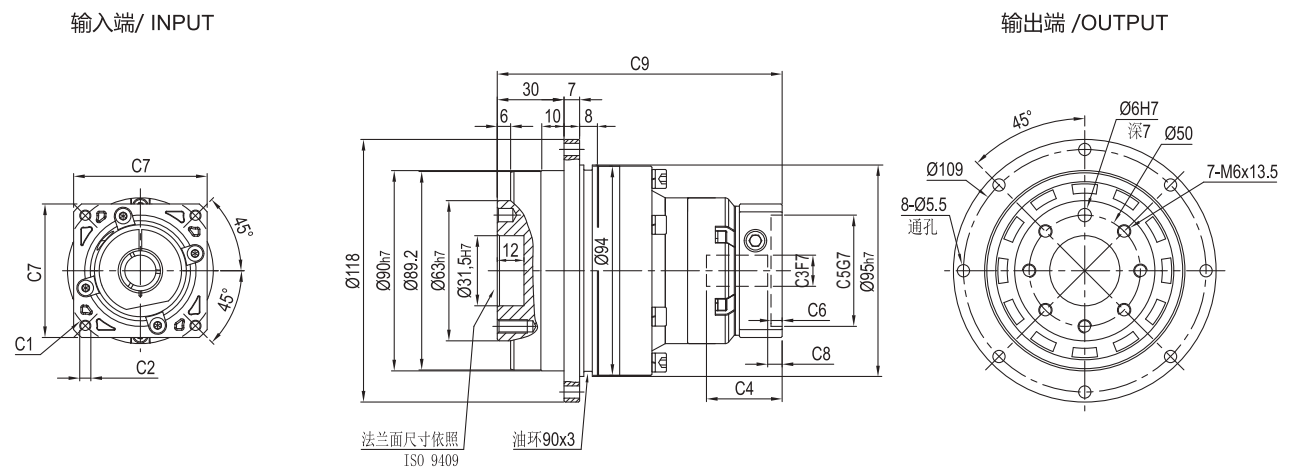
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

FAD-090-L1



FAD-090-L2

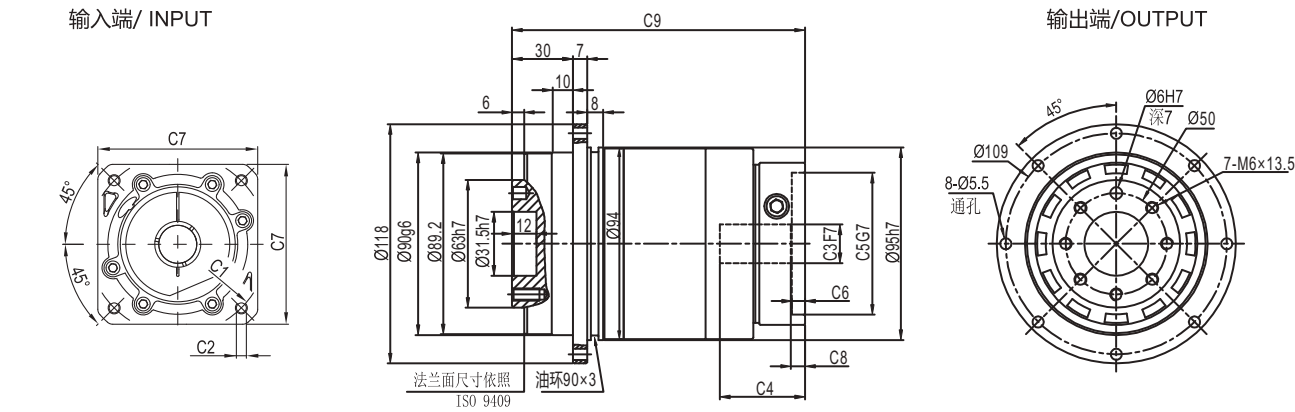


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-090-L1	Ø90	4-M5x12, 4-M6x14	Ø19	42	Ø70	6.5	80	7	104
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	6	104
FAD-090M1-L1	Ø115	4-M8x20	Ø19, Ø22	56.5	Ø95	8	100	16.5	119.5
	Ø145	4-M8x20	Ø19, Ø22, Ø24	59	Ø110	11	130	19	122
FAD-090-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	5.5	128
	Ø70	4-M4x10,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

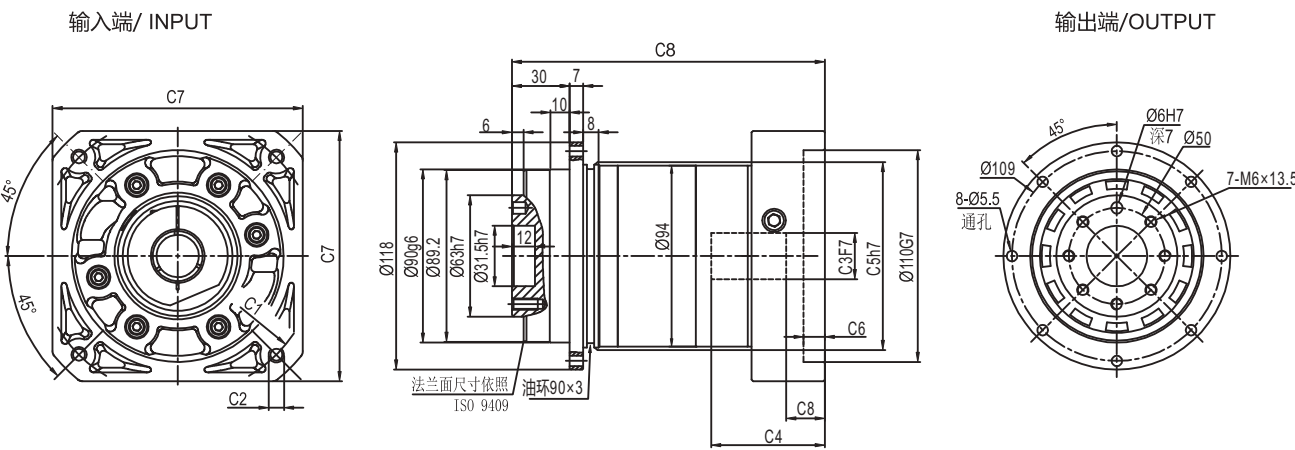
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

FAD-090A-L1



FAD-090A-L2

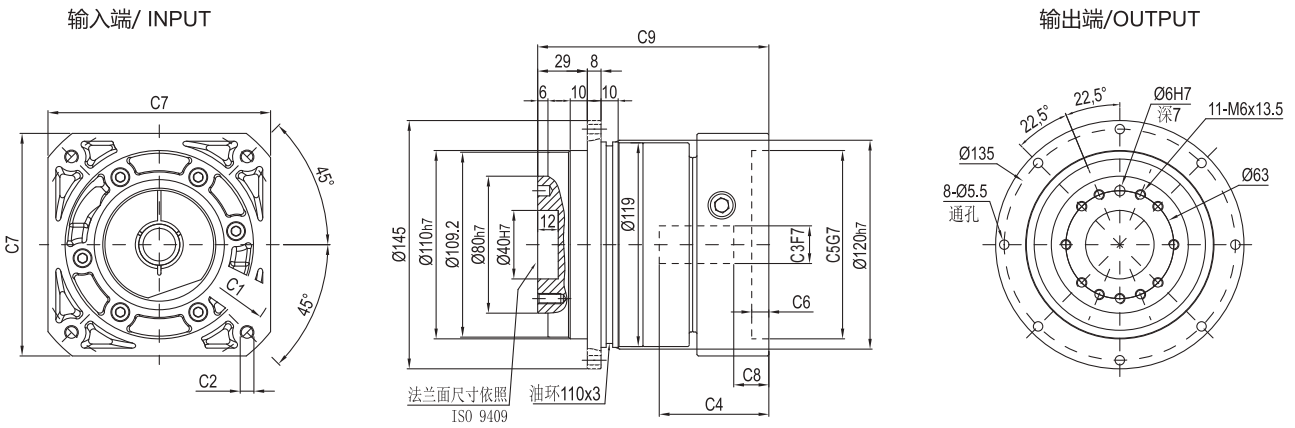


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-090A-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	7	144.5
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	6	144.5
FAD-090AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	16.5	160
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	19	162.5

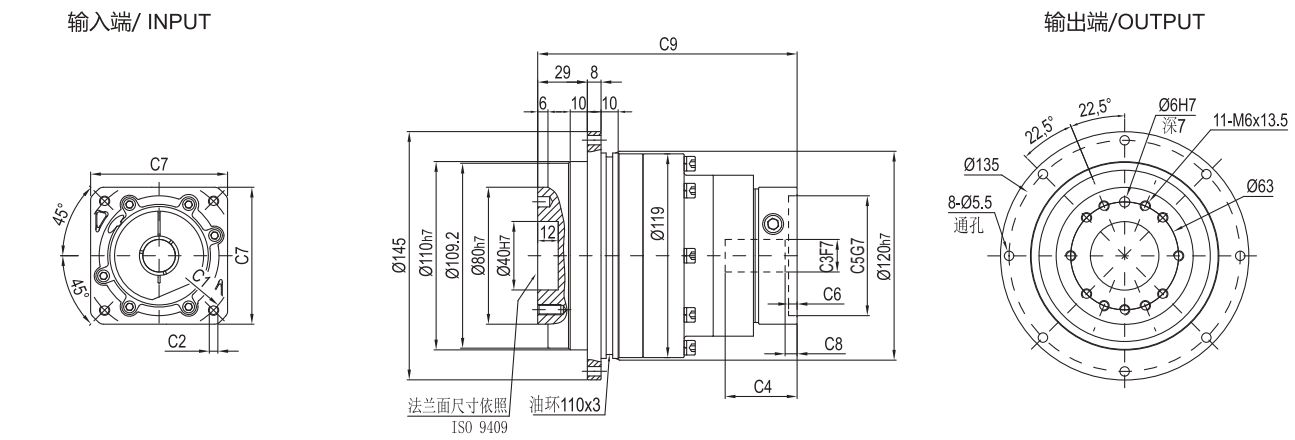
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

FAD-110-L1



FAD-110-L2



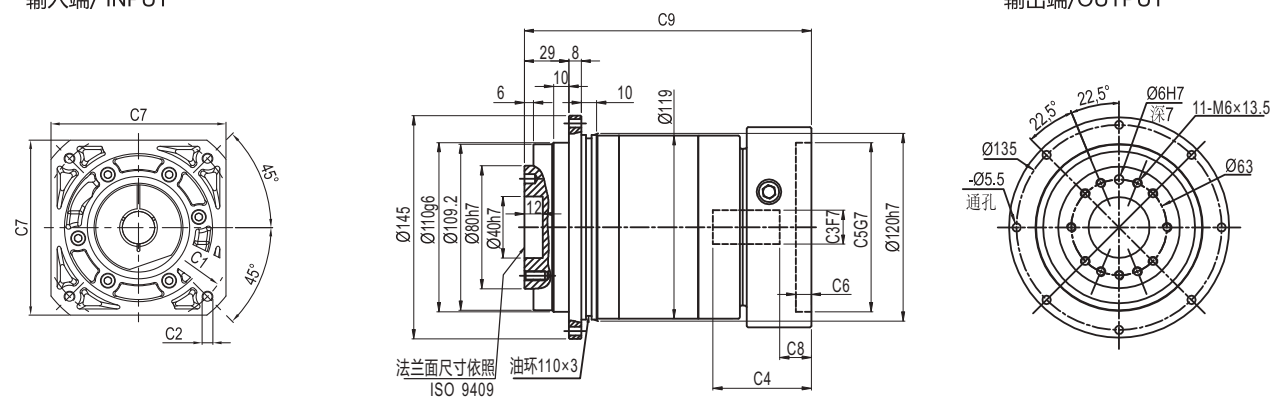
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-110-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	19.5	135
FAD-110M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	28	152.5
FAD-110-L2	Ø90	4-M5x12, 4-M6x14	Ø19	42	Ø70	6.5	80	7	151.5
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	6	151.5
FAD-110M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	16.5	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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

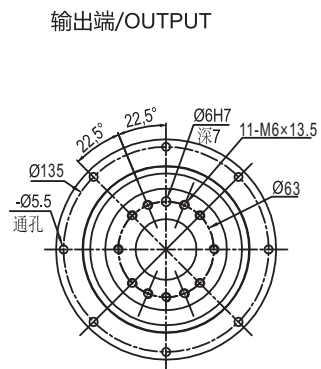
产品尺寸 / product dimension

FAD-110A-L1

输入端/ INPUT

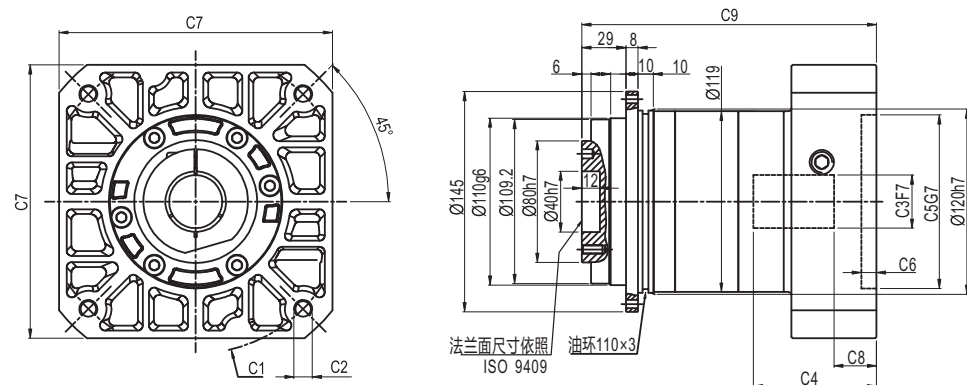


输出端/OUTPUT

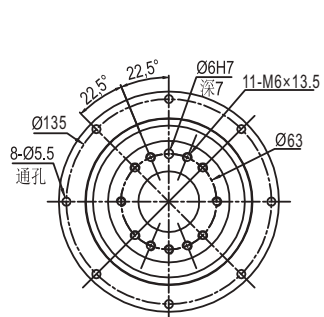


FAD-110A-L2

输入端/ INPUT



输出端/OUTPUT



尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-110A-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	19.5	186.5
FAD-110AM1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	28	194

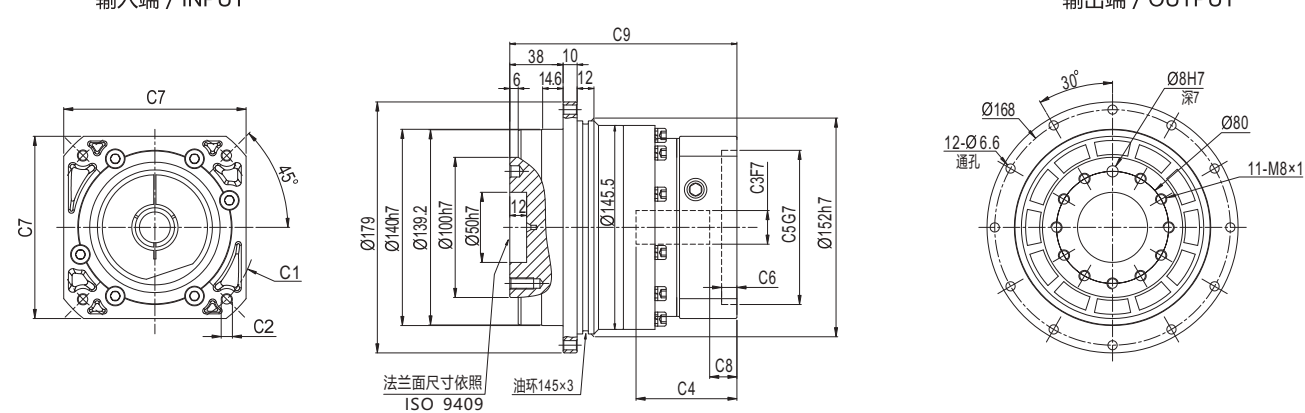
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。

*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.

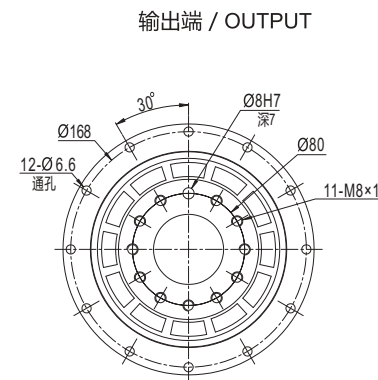
产品尺寸 / product dimension

FAD-140-L1

输入端 / INPUT

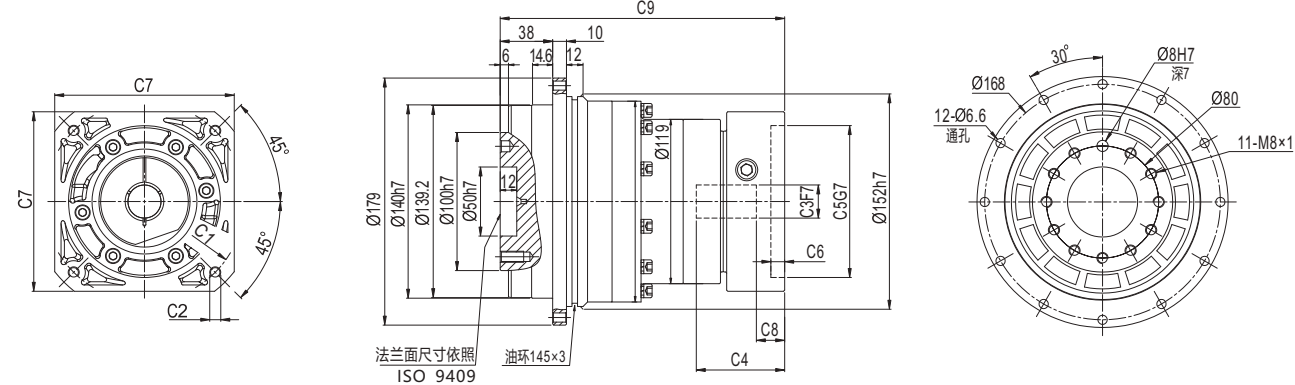


输出端 / OUTPUT

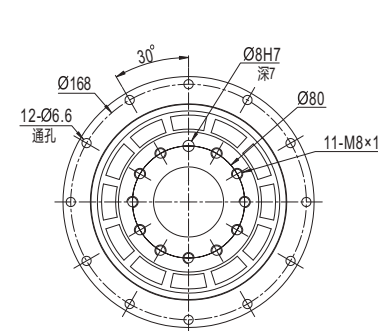


FAD-140-L2

输入端 / INPUT



输出端 / OUTPUT



尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-140-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-140-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~C7 are motor(metric standard) specific dimensions, which could be customized.

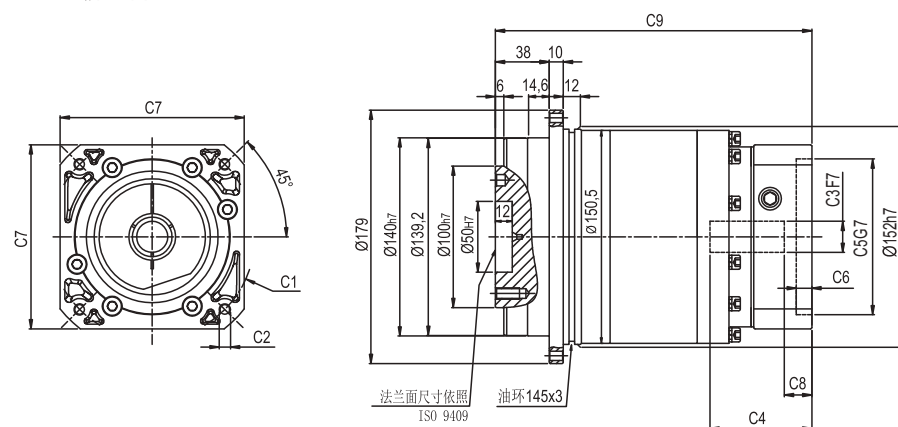
*M1:极限孔(版本号)

*M1:Limit hole (Version number)

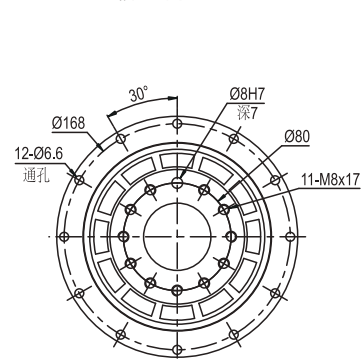
产品尺寸 / product dimension

FAD-140A-L2

输入端/ INPUT



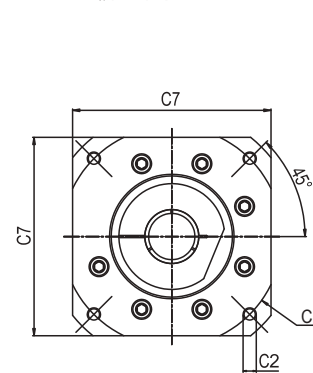
输出端/OUTPUT



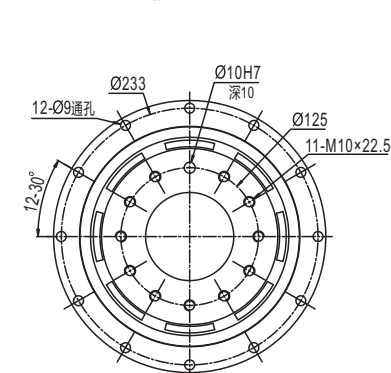
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-140A- L2	Ø145	4-M8x20	Ø22, Ø24	72	Ø110	11	130	19.5	223.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	25	233.5

*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。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.

输入端 / INPUT

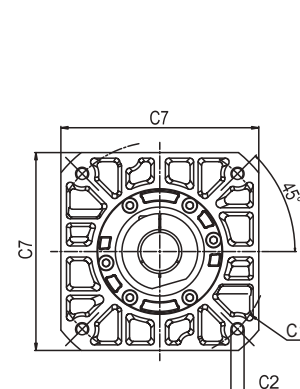


输出端 / OUTPUT

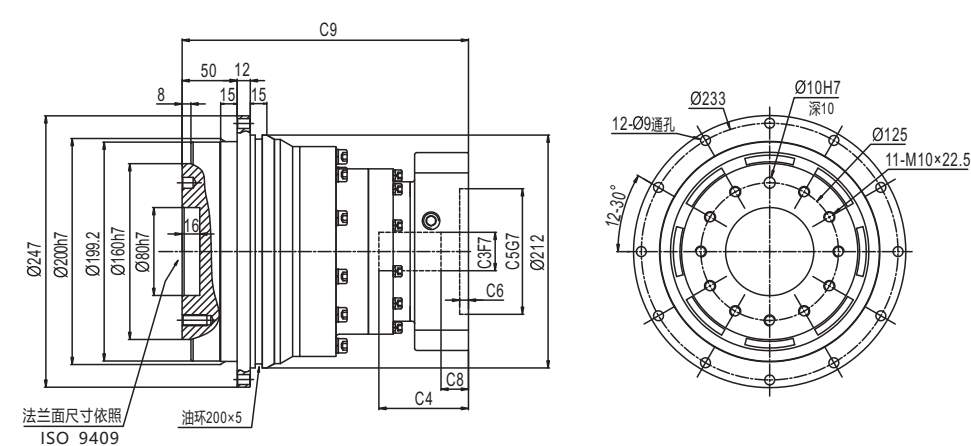


FAD-200-L2

输入端 / INPUT



输出端 / OUTPUT



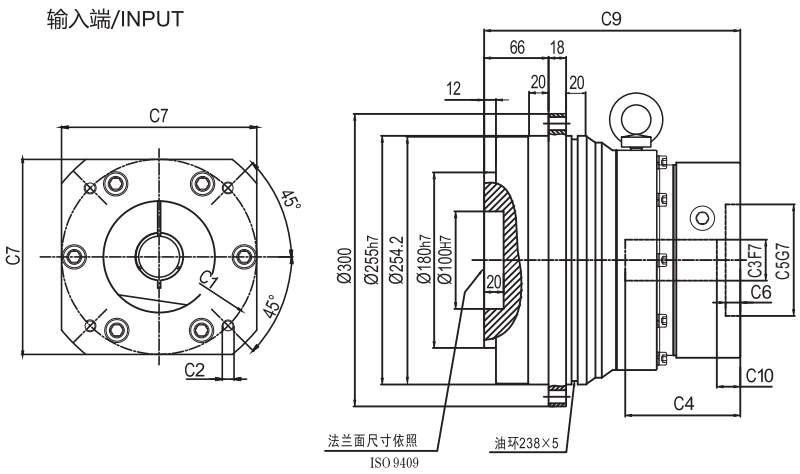
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-200-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	8.5	197.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	45.5	233
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	13.5	202.5
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	45.5	233
FAD-200-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	19.5	250.5
	Ø200	4-M12x28	Ø35	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~C7 are motor(metric standard) specific dimenisions, which could be customized.

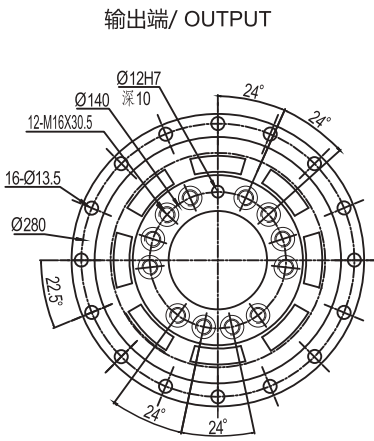
产品尺寸 / product dimension

FAD-255-L1

输入端/INPUT

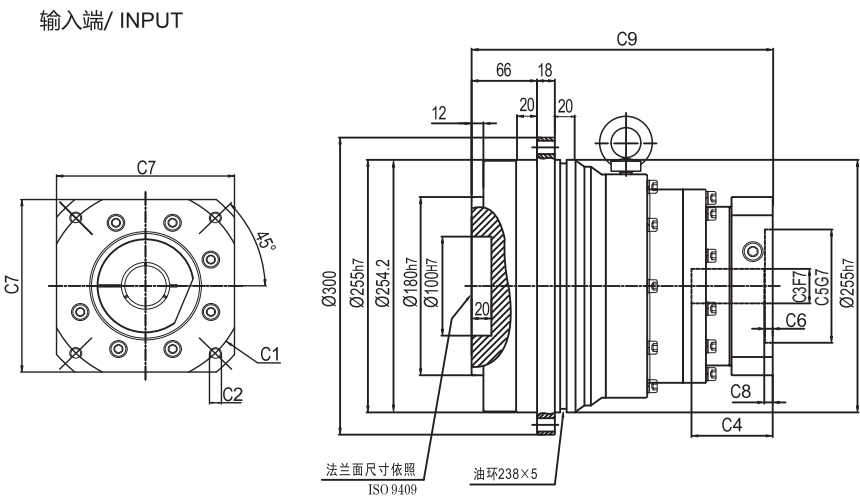


输出端/ OUTPUT

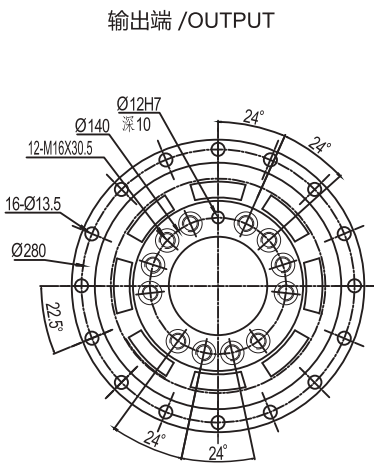


FAD-255-L2

输入端/ INPUT



输出端 /OUTPUT



尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FAD-255-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-255-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~C7 are motor(metric standard) specific dimenisions, which could be customized.

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型号说明 / model description

FADR

—

090

—

010

—

P2

—

马达

减速机型式 Model :
FADR-047/FADR-064/FADR-090
FADR-110/FADR-140/FADR-200/FADR-255

背隙 Backlash: P0 : 超精密背隙 Ultra-precision backlash
P1 : 精密背隙 Precision backlash
P2 : 标准背隙 Standard backlash

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
Ratio : Single-stage : 4,5,6,7,8,10,14,20
Dual-stages : 20,25,35,40,50,60,70,80,
100,120,140,160,200

马达安装尺寸:
Motor mounting dimension

选用范例: FADR-090-010-S2-P2-19-70-90-M6-45

技术参数 / technical specification

规格 Model	级数 Stage	减速比 ¹ Ratio	FADR047	FADR064	FADR090	FDR090A	FADR110	FADR110A	FADR140	FADR140A	FADR200	FADR255
额定输出力矩T _{2N} Rated output torque	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	130	270	270	560	560	1,100	1,700
		25	22	60	160	160	330	330	650	650	1,200	2,000
		35	22	60	160	160	330	330	650	650	1,200	2,000
		40	22	48	130	130	270	270	560	560	1,100	1,700
		50	22	60	160	160	330	330	650	650	1,200	2,000
		60	-	55	150	150	310	310	600	600	1,100	1,900
		70	22	60	160	160	330	330	650	650	1,200	2,000
		80	-	48	130	130	270	270	560	560	1,100	1,700
		100	22	60	160	160	330	330	650	650	1,200	2,000
		120	-	-	150	150	310	310	600	600	1,100	1,900
		140	-	-	140	140	300	300	550	550	1,100	1,800
		160	-	-	120	120	260	260	500	500	1,000	1,600
		200	-	-	100	100	230	230	450	450	900	1,500
最大输出力矩T _{2s} /Max.output torque	Nm	1,2	4~200	3倍额定输出力矩 3 times the rated output torque								
额定输入转速n ₁ /Rated input speed	rpm	1,2	4~200	5,000	5,000	4,000	4,000	4,000	4,000	3,000	3,000	2,000
最大输入转速n _{1s} /Max.input speed	rpm	1,2	4~200	10,000	10,000	8,000	8,000	8,000	8,000	6,000	6,000	4,000
超精密背隙 P0/Ultra-precision backlash	arcmin	1	4~20	-	-	≤2	≤2	≤2	≤2	≤2	≤2	≤2
		2	20~200	-	-	≤4	≤4	≤4	≤4	≤4	≤4	≤4
精密背隙 P1/Precision backlash	arcmin	1	4~20	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4	≤4
		2	20~200	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7
标准背隙 P2/Precision backlash	arcmin	1	4~20	≤6	≤6	≤6	≤6	≤6	≤6	≤6	≤6	≤6
		2	20~200	≤9	≤9	≤9	≤9	≤9	≤9	≤9	≤9	≤9
扭转刚性/Torsional rigidity		1,2	4~200	7	13	31	31	82	82	151	151	440
最大弯曲力矩 M _{max} ² /Maximum bending moment	Nm	1,2	4~200	42.5	125	235	235	430	430	1,300	1,300	3,064
容许径向力 F _{ra} ² /Allowable radial force	N	1,2	4~200	1,080	2,110	2,310	2,310	4,800	4,800	6,200	6,200	5,450
使用寿命/Life time	hr	1,2	4~200	20,000 *								
效率 η /Efficiency	%	1	4~20	≥95%								
		2	20~200	≥92%								
重量/Weight	kg	1	4~20	1.1	2.1	5.9	—	10.5	—	21.9	—	50.9
		2	20~200	1.4	1.9	4.5	8.26	9.8	14.7	20.1	30.6	45.4
使用温度/Operating temperature	°C	1,2	4~200	-10°C~-+90°C								
润滑/lubrication		1,2	4~200	合成润滑油脂 Synthetic lubricating grease								
防护等级/Ingress protection		1,2	4~200	IP65								
安装方向/Mount position		1,2	4~200	任意方向 Any direction								
噪音值(n ₁ =3000rpm)/Noise level	dB	1,2	4~200	≤61	≤63	≤65	≤65	≤68	≤68	≤70	≤70	≤74

减速机转动惯量 Gearbox moment of inertia

规格 Model	级数 Stage	减速比 ¹ Ratio	FADR047	FADR064	FADR090	FDR090A	FADR110	FADR110A	FADR140	FADR140A	FADR200	FADR255
转动惯量J _i Moment of inertia	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	2.25	6.84	6.84	23.4	23.4	68.9
		50	—	0.07	0.31	1.87	1.87	6.25	6.25	21.8	21.8	65.6
		60	—	0.07	0.35	2.25	2.25	6.84	6.84	—	—	—
		70~100	—	0.07	0.31	1.87	1.87	6.25	6.25	21.8	21.8	65.6
		120~200	—	0.07	0.31	1.87	1.87	6.25	6.25	21.8	21.8	65.6

1.减速比 Ratio(i=N_{in}/N_{out})

* 连续运转降低使用寿命二分之一。

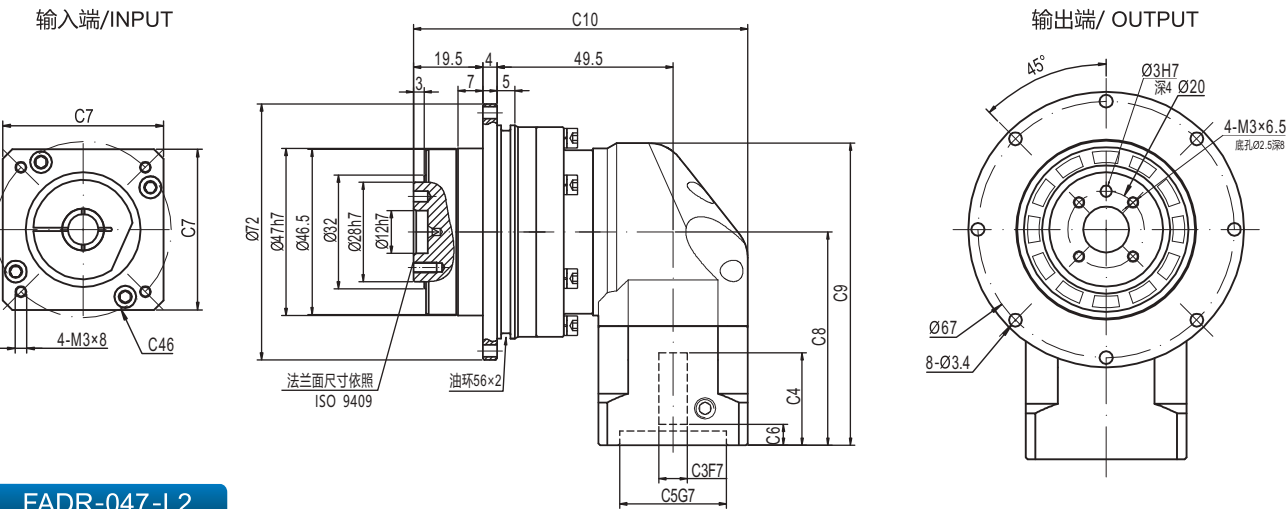
The lifetime will be shortened by half under continuous operation.

2.输出转速 100rpm 时，作用于输出轴中心位置。

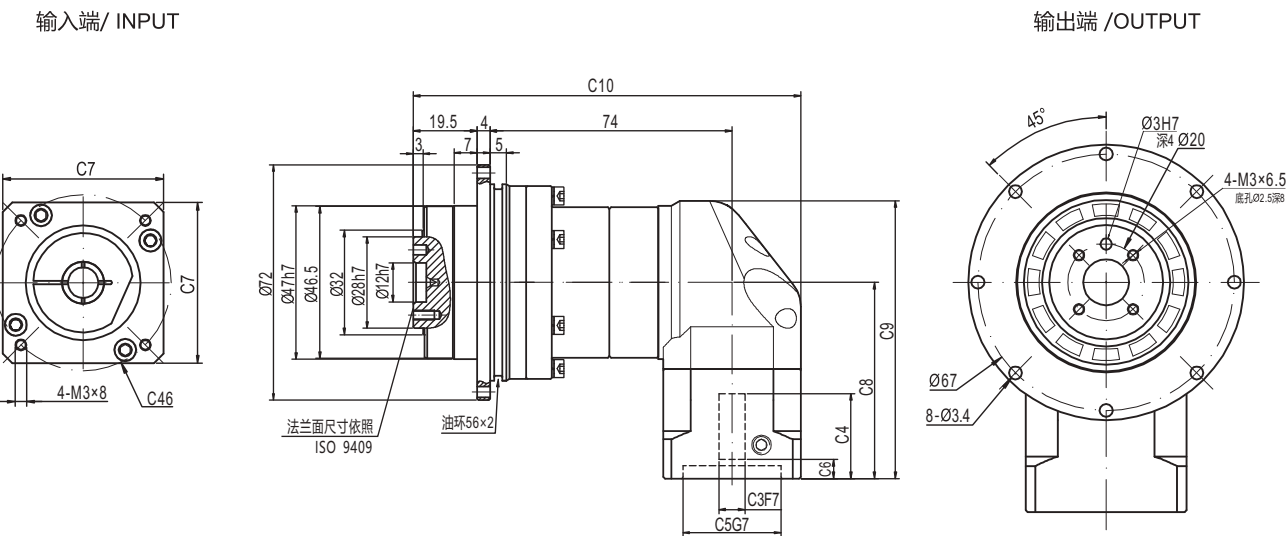
When the output speed is 100rpm, it applies on the center of the output shaft.

产品尺寸 / product dimension

FADR-047-L1



FADR-047-L2

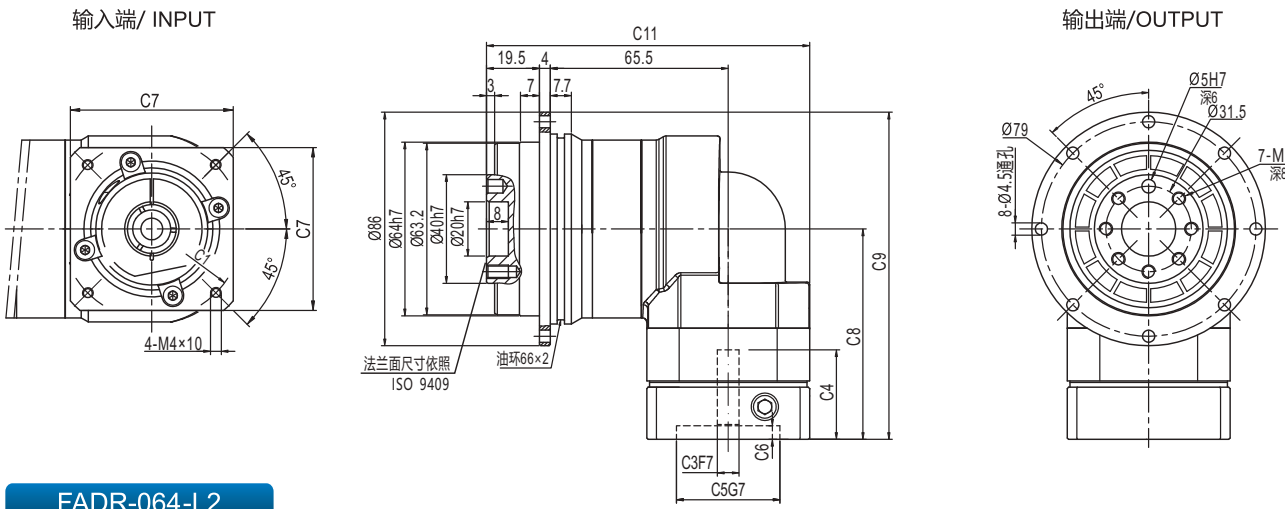


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FADR-047-L1	Ø46	4-M4x10	Ø8	26	Ø30	4	42	60	96	94
	Ø45	4-M3x8								
FADR-047-L2	Ø46	4-M4x10	Ø8	26	Ø30	4	42	60	96	118.5
	Ø45	4-M3x8								

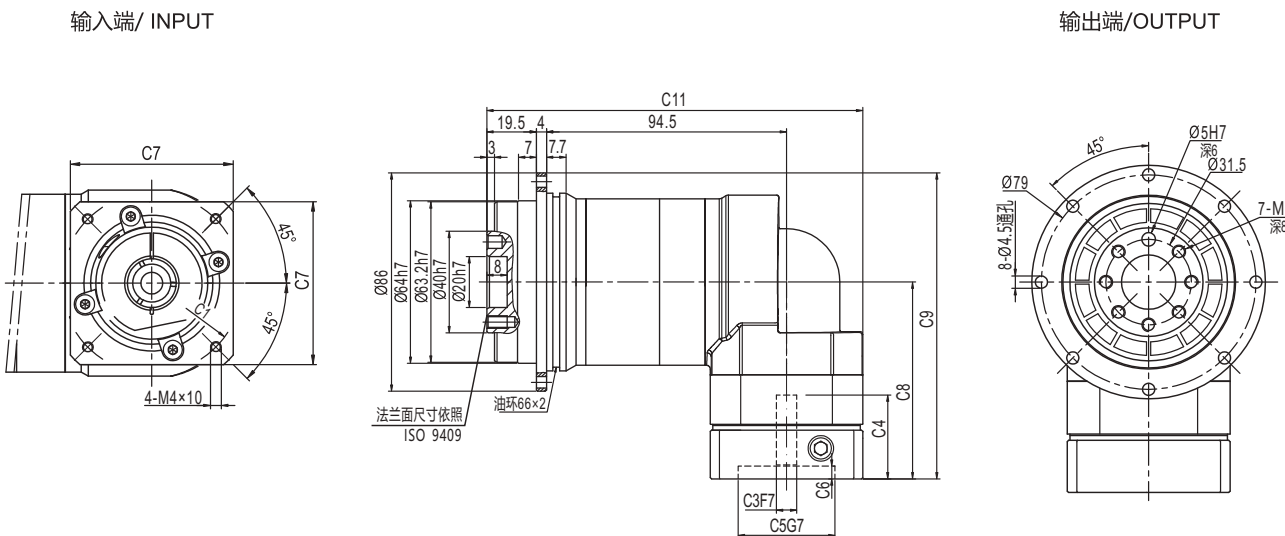
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.

产品尺寸 / product dimension

FADR-064-L1



FADR-064-L2

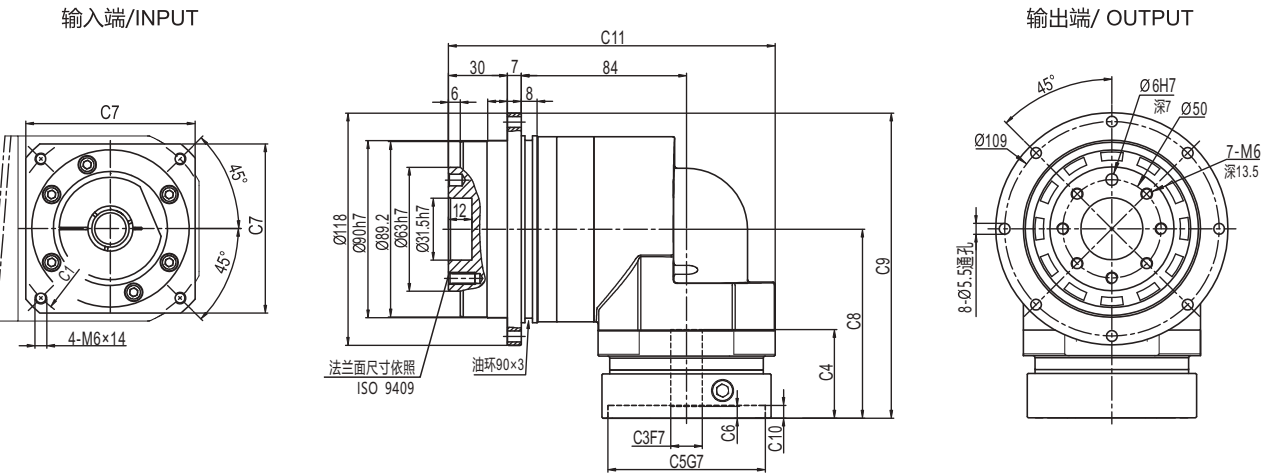


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FADR-064-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	77.5	120.5	5.5	119
FADR-064-L2											148
FADR-064-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	77.5	120.5	5.5	119
FADR-064-L2											148
FADR-064M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	87	130	12	129
FADR-064M1-L2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

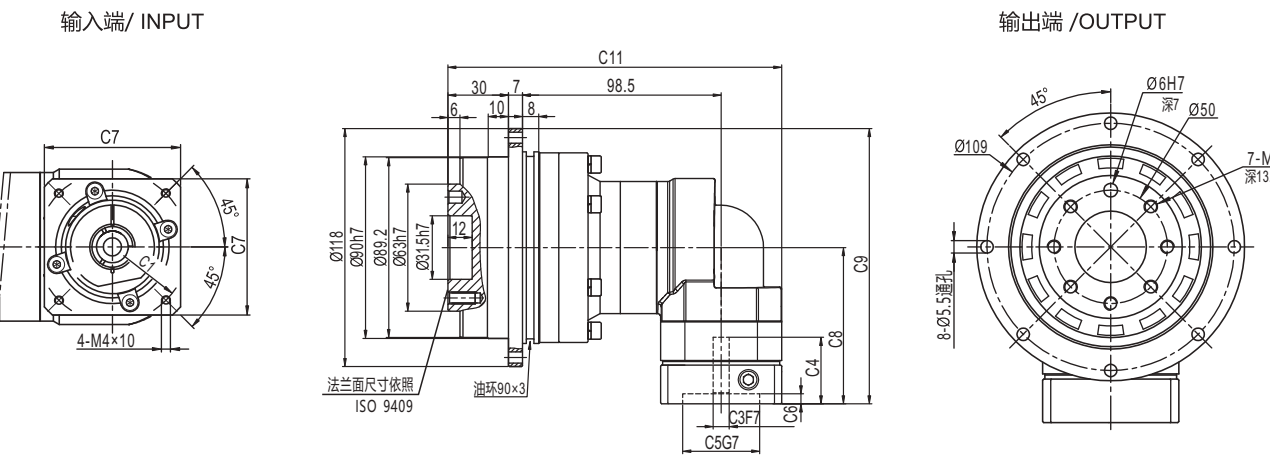
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

FADR-090-L1



FADR-090-L2

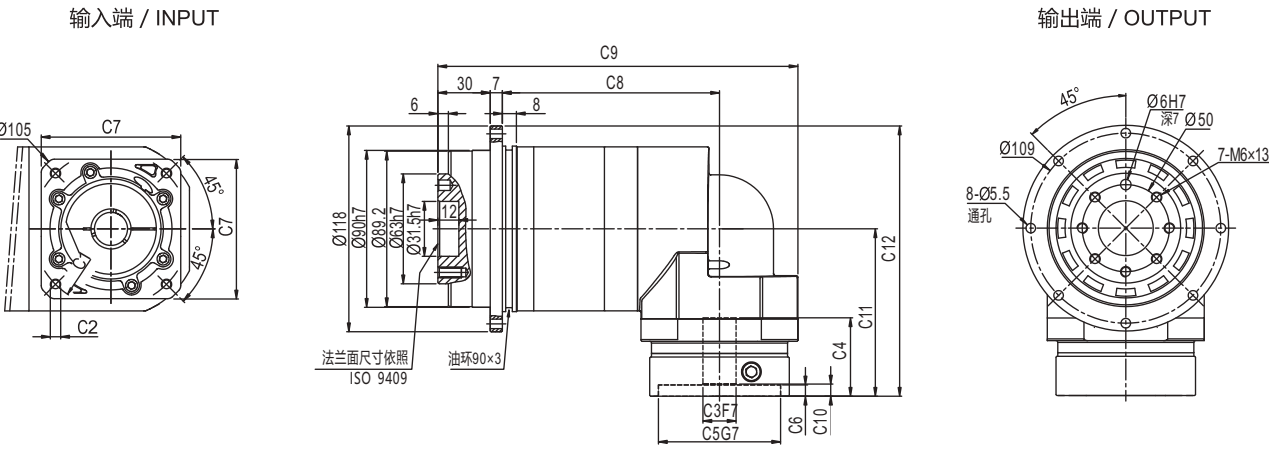


尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FADR-090-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	96	155	7	166
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	96	155	6	166
FADR-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	117.5	176.5	16.5	171
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	120	179	19	186
FADR-090-L2	Ø66.7	4-M4x10	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

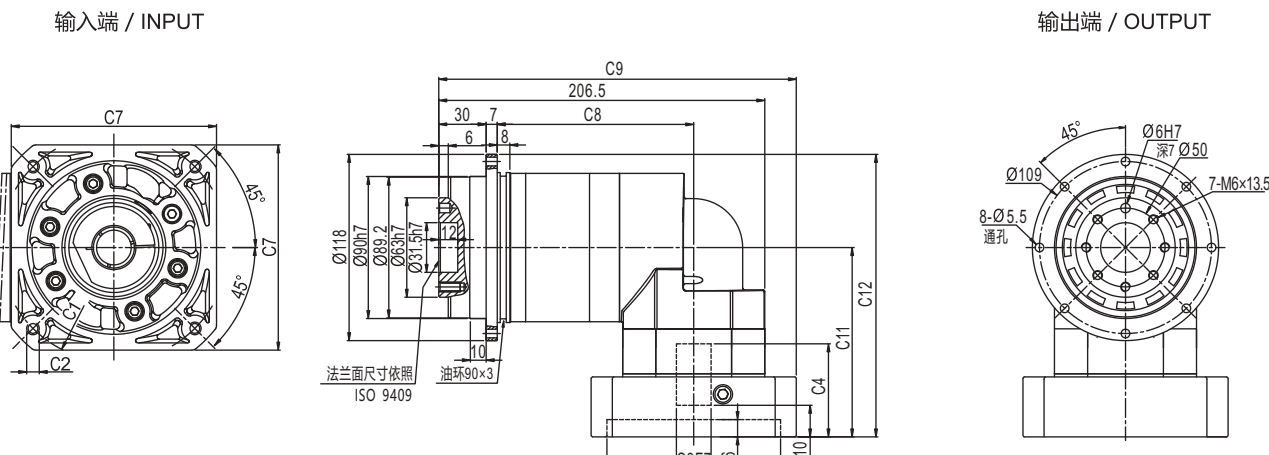
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

FADR-090A-L2



FADR-090A-L2

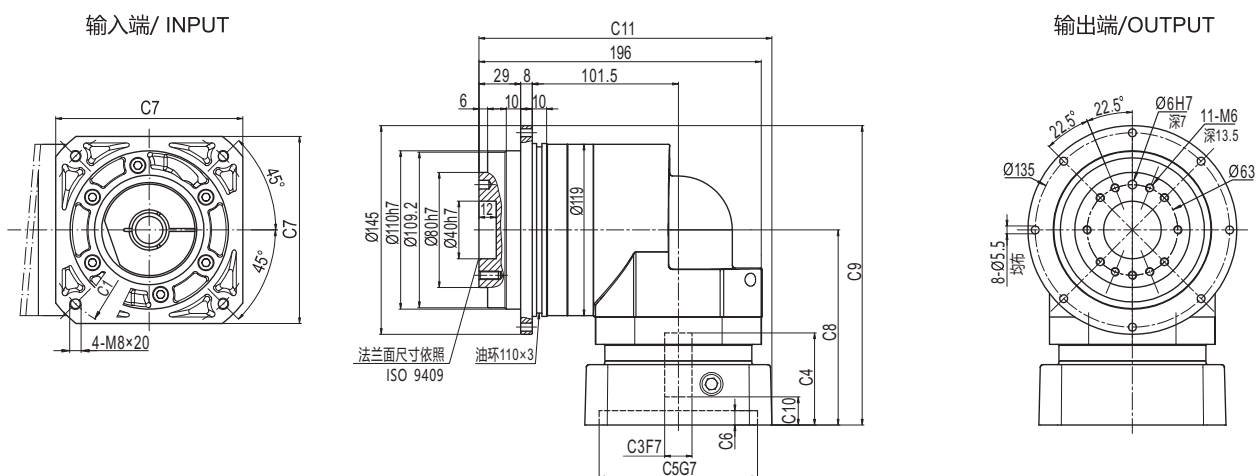


尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FADR-090A-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	124.5	206.5	7	96	155
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	124.5	206.5	6	96	155
FADR-090AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	124.5	211.5	16.5	117.5	176.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	10	130	124.5	269.5	19	120	179

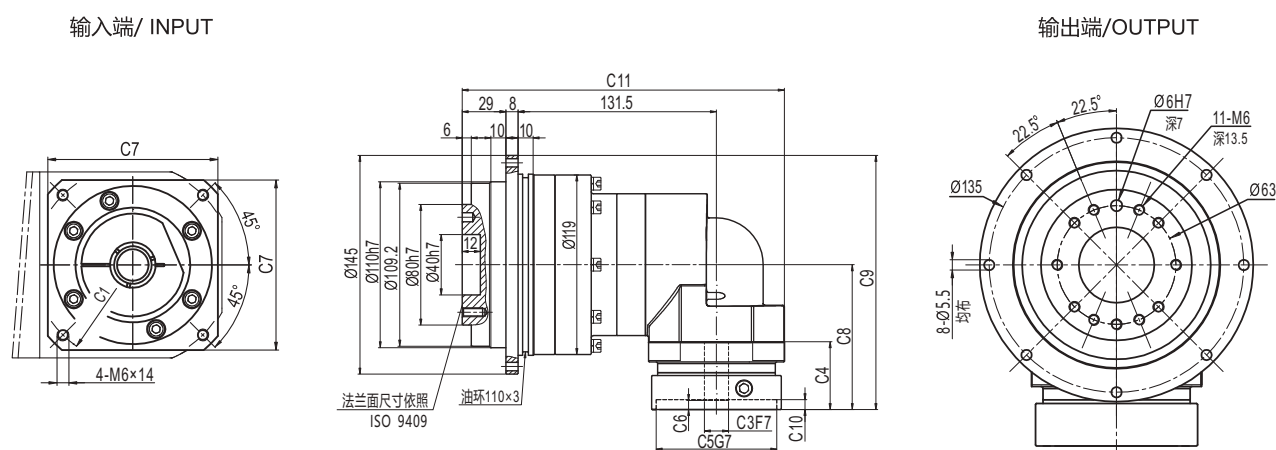
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

FADR-110-L1



FADR-110-L2

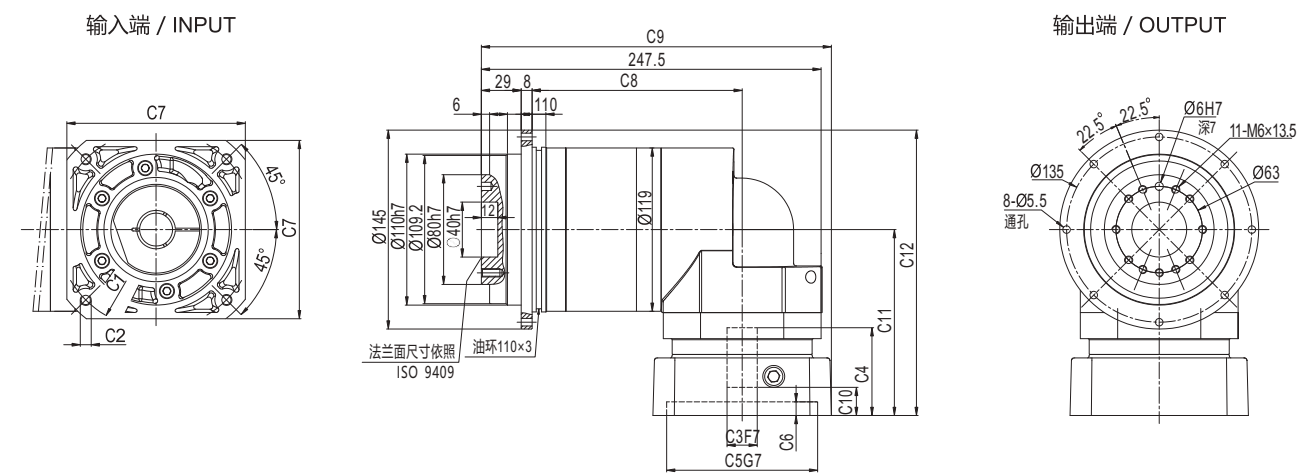


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FADR-110-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	135.5	208	19.5	203.5
FADR-110M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	152.5	225	28	228.5
FADR-110-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	96	168.5	7	213.5
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	96	168.5	6	213.5
FADR-110M1-L2	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

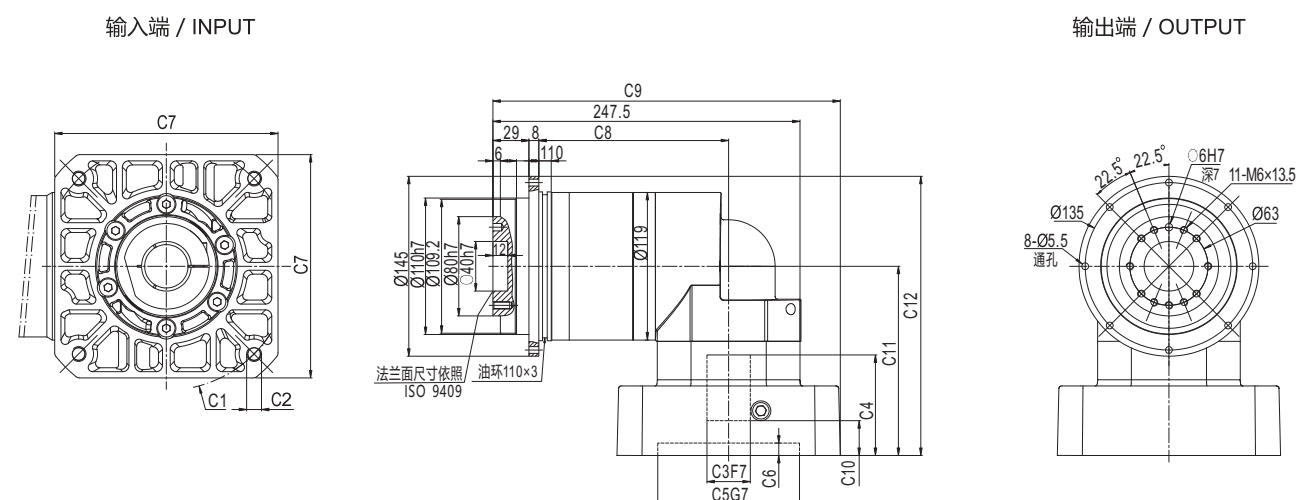
*C1~C7是公制标准马达连接板的尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

FADR-110A-L2



FADR-110A-L2



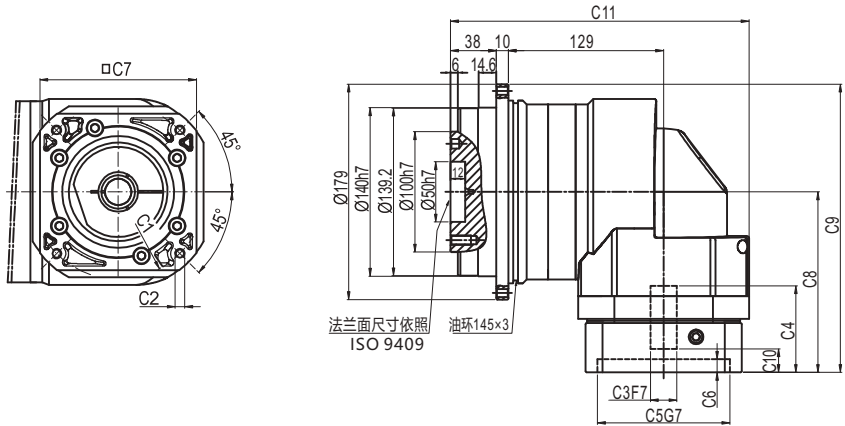
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FADR-110A-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	153	255	19.5	135.5	208
FADR-110AM1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	153	180	28	152.5	225

*C1~C7是公制标准马达连接板的尺寸，可根据客户要求单独定做。
*C1~C7are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

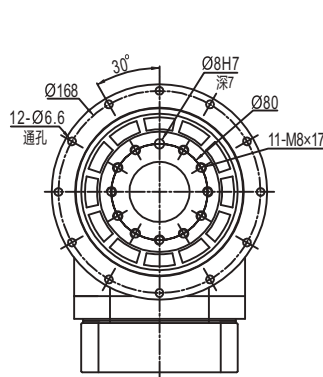
产品尺寸 / product dimension

FADR-140-L1

输入端 / INPUT

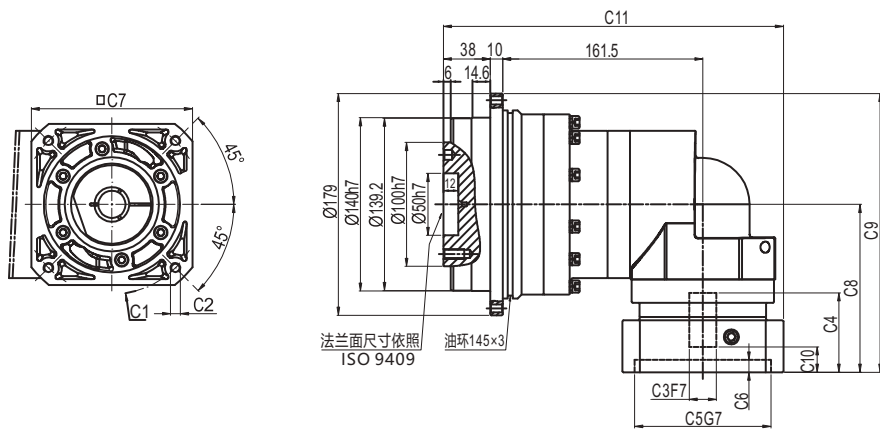


输出端 / OUTPUT

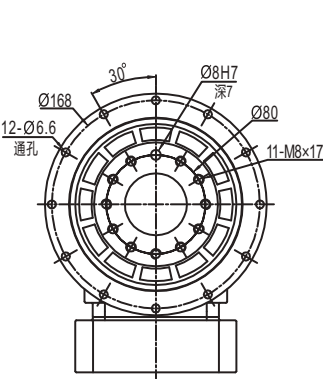


FADR-140-L2

输入端 / INPUT



输出端 / OUTPUT



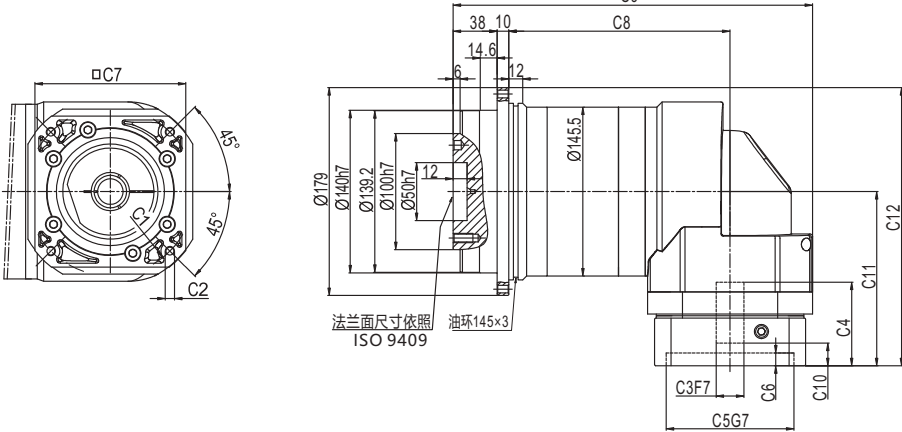
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FADR-140-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	150	239.5	19.5	248
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	160	249.5	25	267
FADR-140-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	135.5	225	19.5	274.5
FADR-140M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	152.5	242	28	299.5

*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。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

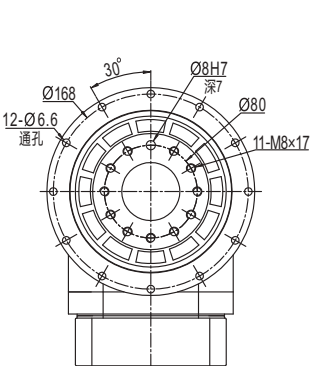
产品尺寸 / product dimension

FADR-140A-L2

输入端 / INPUT



输出端 / OUTPUT

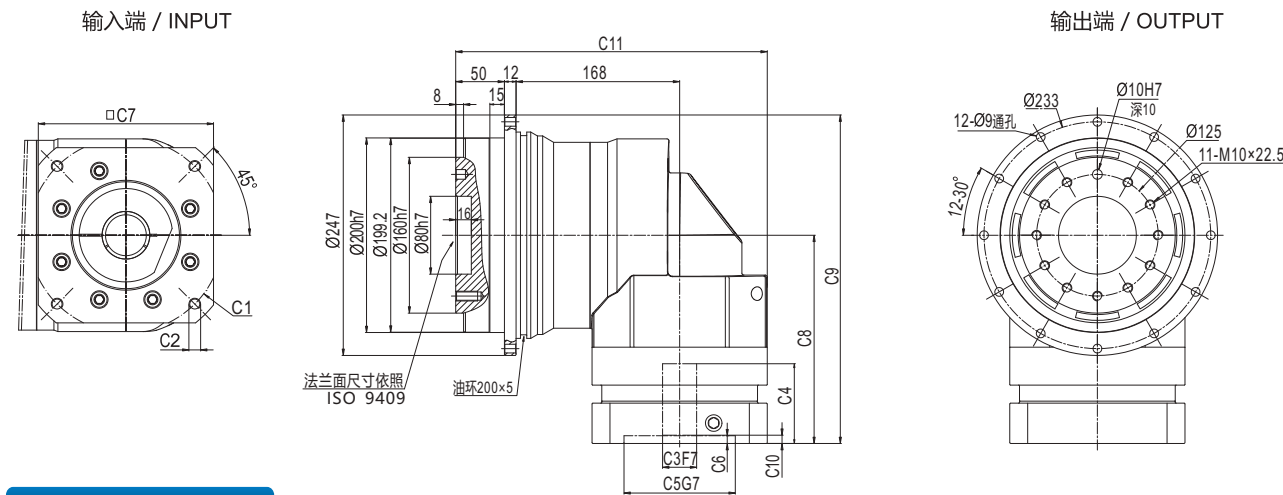


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FADR-140A-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	190.5	309.5	19.5	150	239.5
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	190.5	328.5	25	160	248.5

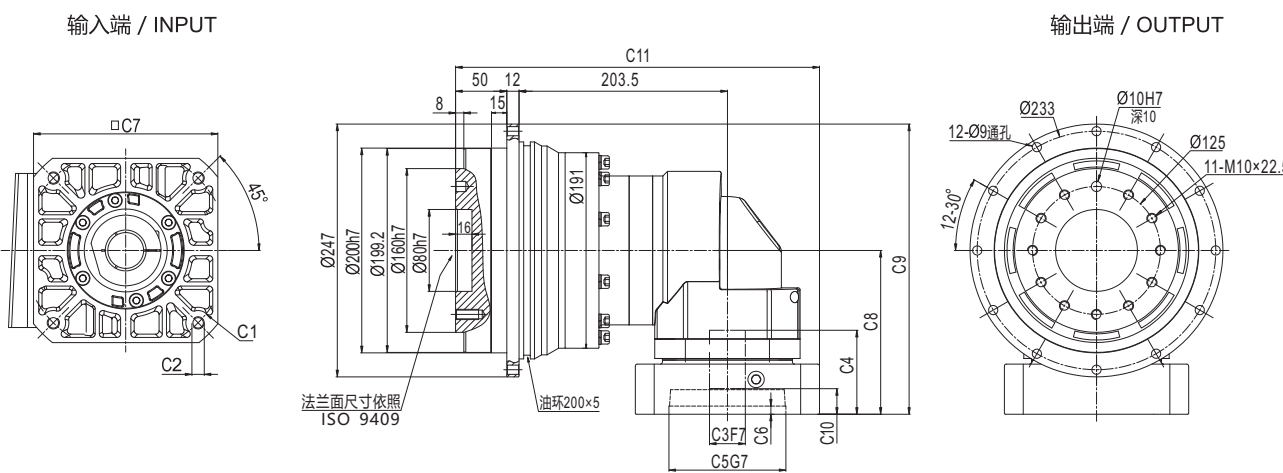
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.

产品尺寸 / product dimension

FADR-200-L1



FADR-200-L2

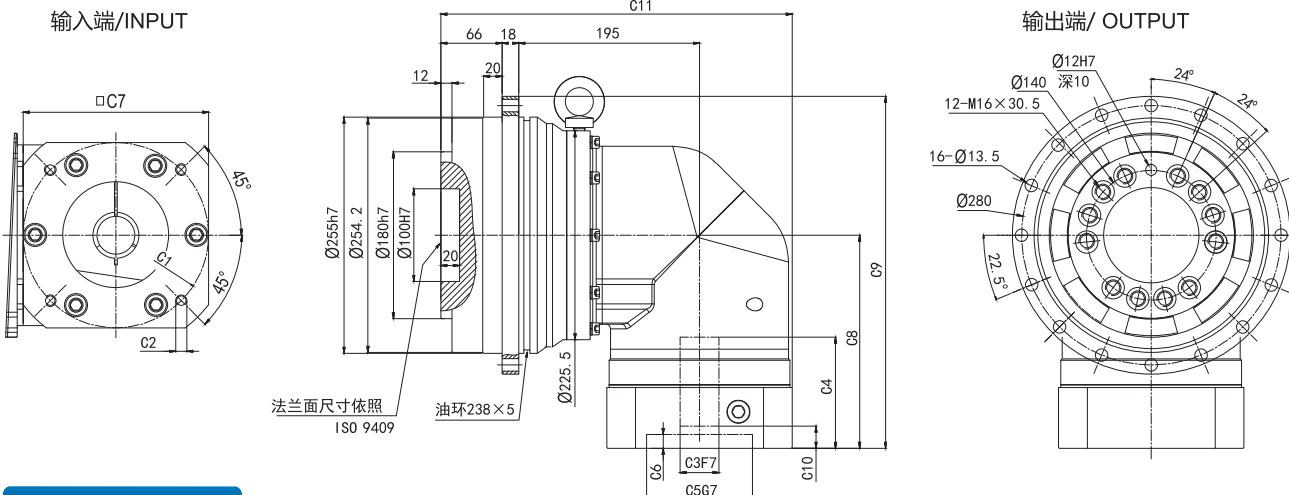


尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FADR-200-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	214	337.5	8.5	320
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	249.5	373	45.5	320
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	219	342.5	13.5	326
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	249.5	373	45.5	320
FADR-200-L2	Ø145	4-M8x20	Ø22,Ø24	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

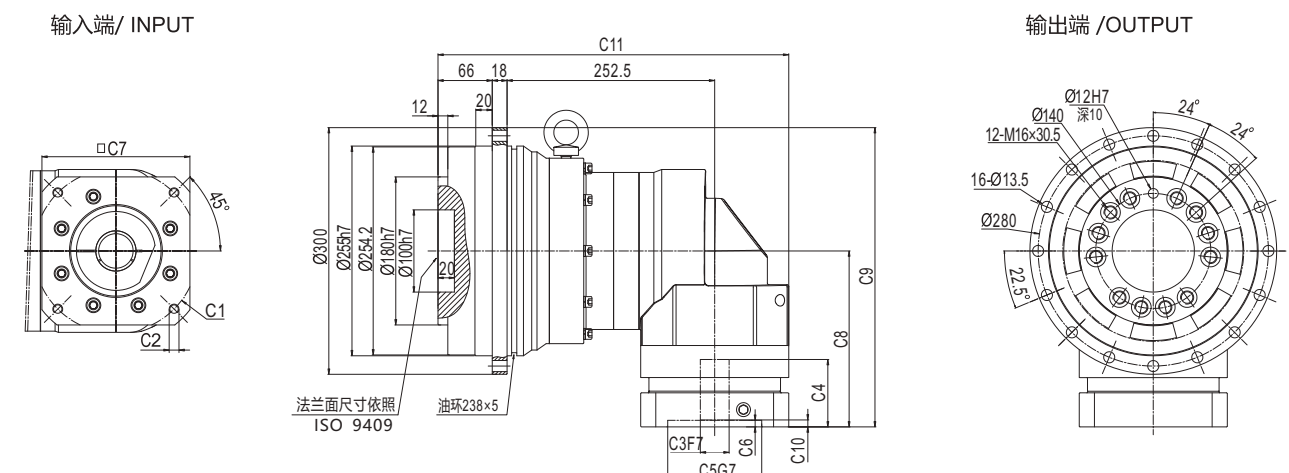
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.

产品尺寸 / product dimension

FADR-255-L1



FADR-255-L2



尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
FADR-255-L1	Ø200	4-M12x30	Ø35,Ø42	120	Ø114.3	15	200	230	380	22.5	379
	Ø215	4-M12x30	Ø38	110	Ø180	8	200	220	370	12.5	379
	Ø235	4-M12x30	Ø42,Ø55	120	Ø200	10	220	230	380	24	389
FADR-255-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~C7 are motor(metric standard) specific dimenisions, which could be customized.

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PRECISION PLANETARY
GEAR BOX

精密行星减速机

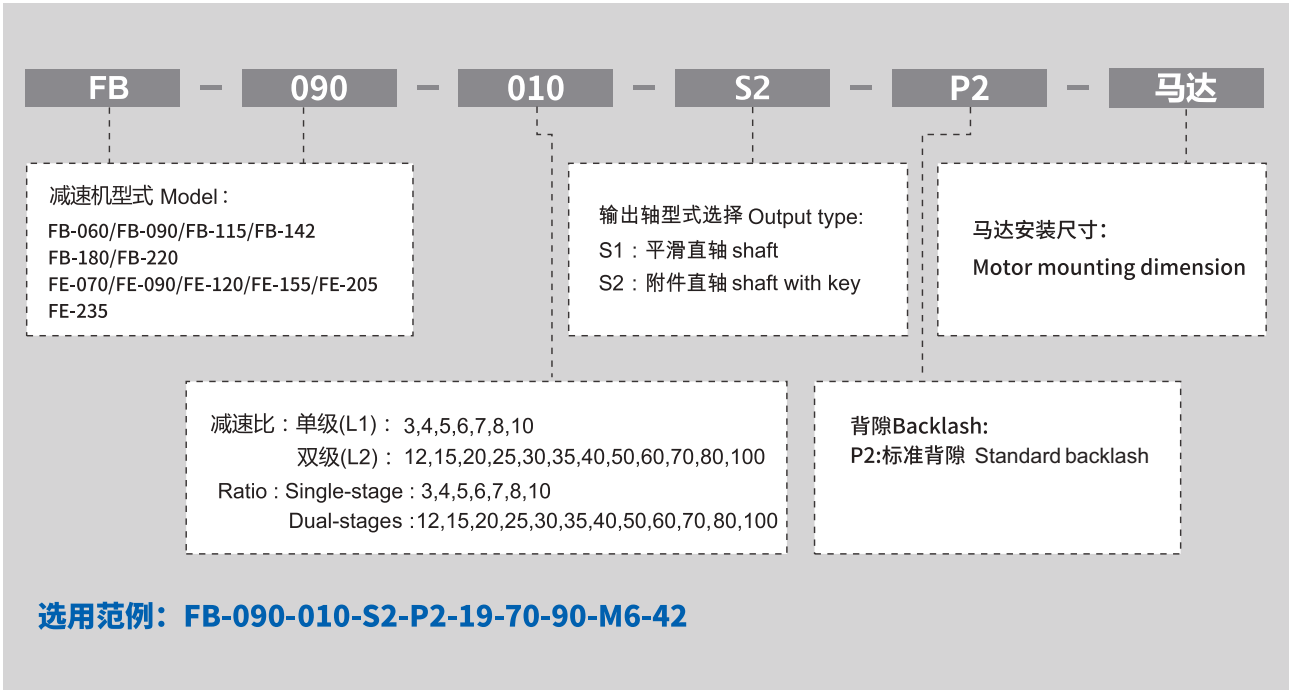
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SKGR三凯

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

FB/FE系列

型号说明 / model description



技术参数 / technical specification

规格 Model		级数 Stage	减速比 ¹ Ratio	FB060 FE070	FB090 FE090	FB090A FE090A	FB115 FE120	FB115A FE120A	FB142 FE155	FB142A FE155A	FB180 FE205	FB220 FE235
额定输出力矩T _{2N} Rated output torque	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	45	120	—	260	—	500	—	1,000	1,600
			10	40	100	—	230	—	450	—	900	1,500
		2	12	55	130	130	208	208	342	342	588	1,140
			15	55	130	130	208	208	342	342	588	1,140
			20	50	140	140	290	290	542	542	1,050	1,700
			25	60	160	160	330	330	650	650	1,200	2,000
			30	50	130	130	208	208	342	342	588	1,140
			35	60	160	160	330	330	650	650	1,200	2,000
			40	50	140	140	290	290	542	542	1,050	1,700
			50	60	160	160	330	330	650	650	1,200	2,000
			60	55	150	150	310	310	600	600	1,100	1,900
			70	50	140	140	300	300	550	550	1,100	1,800
			80	45	120	120	260	260	500	500	1,000	1,600
			100	40	100	100	230	230	450	450	900	1,500
最大输出力矩T _{2S} /Max.output torque	Nm	1,2	3倍额定输出力矩 3 times the rated output torque									
额定输入转速n ₁ /Rated input speed	rpm	1,2	3~100	5,000	4,000	4,000	4,000	3,000	3,000	3,000	2,000	
最大输入转速n _{1S} /Max.input speed	rpm	1,2	3~100	10,000	8,000	8,000	8,000	6,000	6,000	6,000	4,000	
标准背隙P2/Precision backlash	arcmin	1	3~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤5	
		2	12~100	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤7	
扭转刚性/Torsional rigidity	Nm/arcmin	1,2	3~100	7	14	14	25	25	50	50	145	225
容许径向力F _{2rB} ² /Allowable radial force	N	1,2	3~100	1,530	3,250	3,250	6,700	6,700	9,400	9,400	14,500	50,000
容许轴向力F _{2aB} ² /Allowable radial force	N	1,2	3~100	630	1,300	1,300	3,000	3,000	4,000	4,000	6,200	35,000
容许轴向力F _{2aB} ² /Allowable radial force	N	1,2	3~100	765	1,625	1,625	3,350	3,350	4,700	4,700	7,250	25,000
使用寿命/Life time	hr	1,2	3~100	20,000*								
效率η /Efficiency	%	1	3~10	≥97%								
		2	12~100	≥94%								
重量/Weight	kg	1	3~10	1.3	3.7	—	7.8	—	14.5	—	29	48
		2	12~100	1.9	4.1	4.1	9	9	17.5	17.5	33	60
使用温度/Operating temperature	°C	1,2	3~100	-10°C~+90°C								
润滑/lubrication		1,2	3~100	合成润滑油脂 Synthetic lubricating grease								
防护等级/Ingress protection		1,2	3~100	IP65								
安装方向/Mount position		1,2	3~100	任意方向 Any direction								
噪音值(n=3000rpm)/Noise level	dB	1,2	3~100	≤58	≤60	≤60	≤63	≤63	≤65	≤65	≤67	≤70

减速机转动惯量 Gearbox moment of inertia

规格 Model	级数 Stage	减速比 ¹ Ratio	FB060 FE070	FB090 FE090	FB090A FE090A	FB115 FE120	FB115A FE120A	FB142 FE155	FB142A FE155A	FB180 FE205	FB220 FE235
转动惯量J ₁ Moment of inertia	1	3	0.16	0.61	—	3.25	—	9.21	—	28.98	69.61
		4	0.14	0.48	—	2.74	—	7.54	—	23.67	54.37
		5	0.13	0.47	—	2.71	—	7.42	—	23.29	53.27
		6	0.13	0.45	—	2.65	—	7.25	—	22.75	51.72
		7	0.13	0.45	—	2.62	—	7.14	—	22.48	50.97
		8	0.13	0.44	—	2.58	—	7.07	—	22.59	50.84
		10	0.13	0.44	—	2.57	—	7.03	—	22.51	50.56
	2	12	0.14	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
		15	0.13	0.13	0.13	0.47	2.71	2.71	7.42	7.42	23.29
		20	0.13	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
		25	0.13	0.13	0.13	0.47	2.71	2.71	7.42	7.42	23.29
		30	0.13	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
		35	0.13	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
		40	0.13	0.13	0.47	0.47	2.71	2.71	7.42	7.42	23.29
		50	0.13	0.13	0.44	0.44	2.57	2.57	7.03	7.03	22.51
		60	0.13	0.13	0.44	0.44	2.57	2.57	7.03	7.03	22.51
		70	0.13	0.13	0.44	0.44	2.57	2.57	7.03	7.03	22.51
		80	0.13	0.13	0.44	0.44	2.57	2.57	7.03	7.03	22.51
		100	0.13	0.13	0.44	0.44	2.57	2.57	7.03	7.03	22.51

1.减速比Ratio(i=N_{in}/N_{out})

* 连续运转降低使用寿命二分之一。

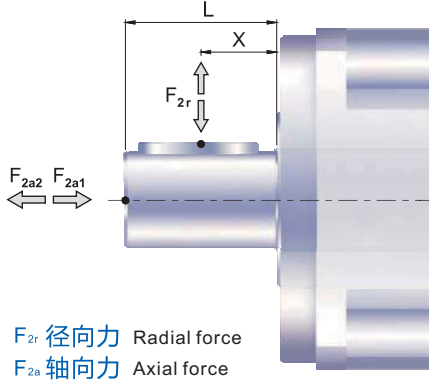
The lifetime will be shortened by half under continuous operation.

2.输出转速 100rpm 时，作用于输出轴中心位置。

When the output speed is 100rpm, it applies on the center of the output shaft.

减速机输出轴之容许径向力及轴向力

ALLOWABLE RADIAL AND AXIAL FORCES ON THE OUTPUT SHAFT OF THE GEAR REDUCER

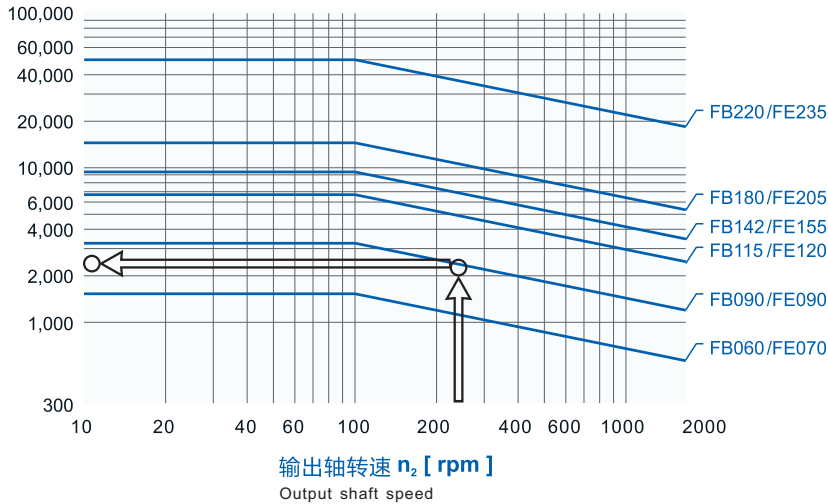


减速机输出轴所能承受之最大径向力及轴向力。端视内部支撑轴承之设计，减速机采用大尺寸的轴承及较大跨距的设计，其能承受更大的径向及轴向负荷。

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

容许径向力F_{2rB}【N】施力于轴中心位置

Permissible radial force F_{2rB}【N】apply force to the center of the shaft



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

When the radial force F_{2r} is applied to the center of the shaft, i.e. X=1/2xL, the allowable radial force F_{2rB} that can be withstood by different specifications of reducers with a service life of 20,000hr* under different output speeds is as follows:

F_{2a1B}=0.2x F_{2rB}

F_{2a2B}=0.1x F_{2rB}

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，查出位置负荷系数K_b，在代入下列公式求出容许

When the radial force F_{2r} is not in the center of the shaft, the closer to the gearbox, that is, X<1/2xL, the allowable radial force that can be borne becomes larger, and the farther away from the reducer, i.e., X>1/2xL, the allowable force that can be borne becomes smaller.

径向力 : Radial force

F'_{2rB}=K_bx F_{2rB}

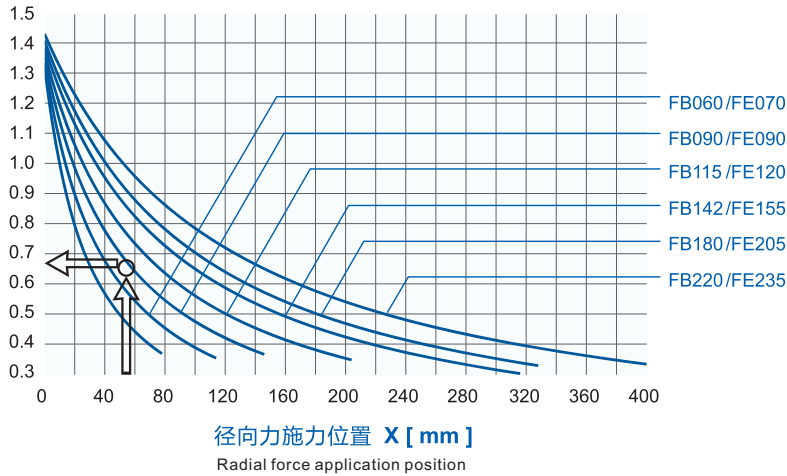
轴向力 : Axial force

F'_{2a1B}=0.2x F'_{2rB}

F'_{2a2B}=0.1x F'_{2rB}

位置符合系数K_b

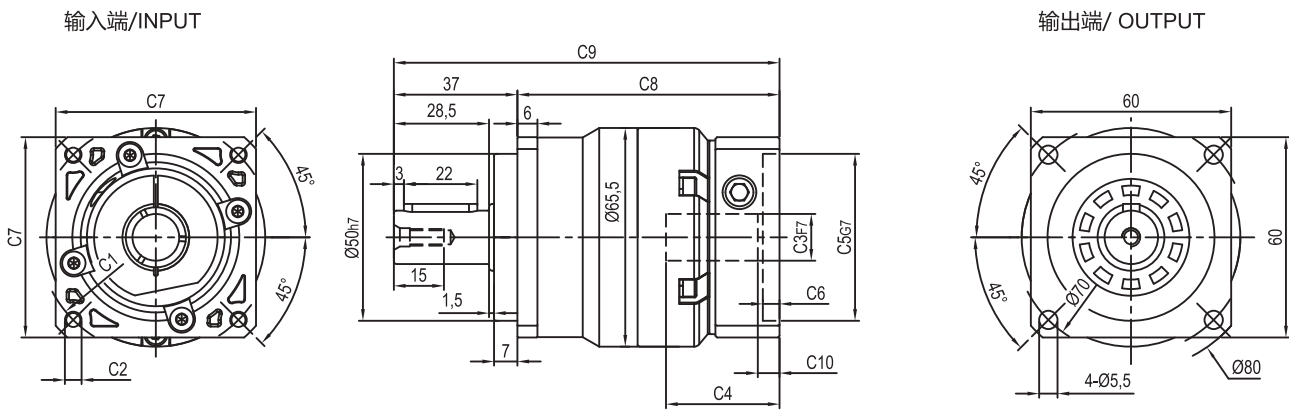
Positional load coefficient



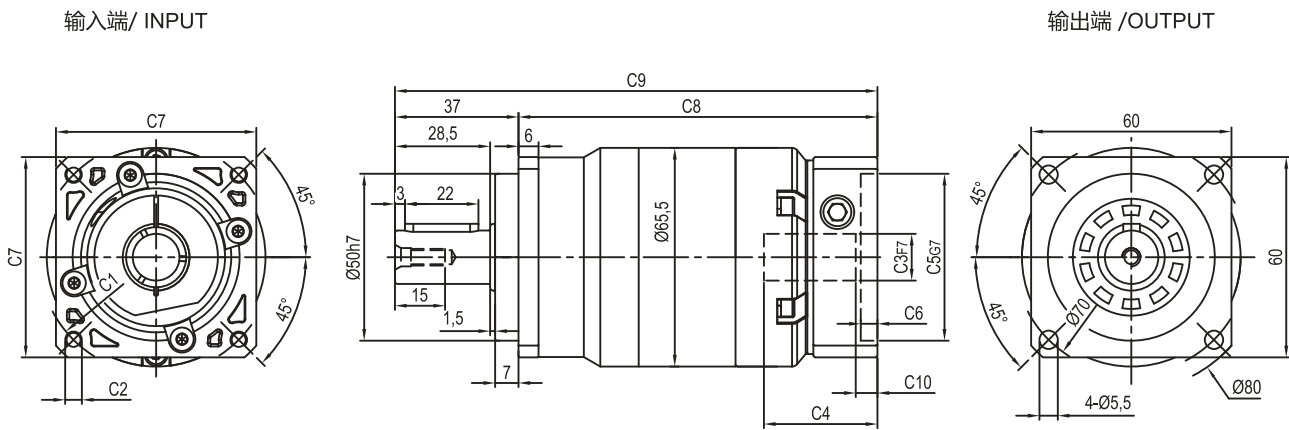
* 连续运转降低使用寿命二分之一。The lifetime will be shortened by half under continuous operation.

产品尺寸 / product dimension

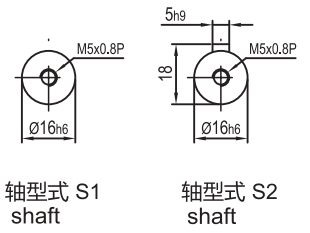
FB-060-L1



FB-060-L2



输出轴径/Output Diameter

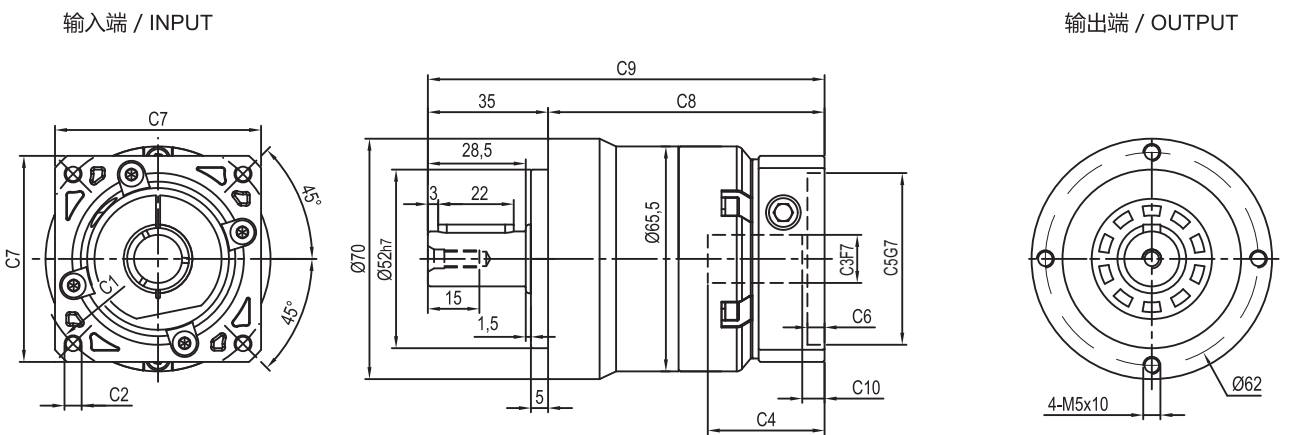


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-060-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	78.5	115.5	5.5
FB-060-L2								107.5	144.5	5.5
FB-060-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	78.5	115.5	5.5
FB-060-L2								107.5	144.5	5.5
FB-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	85	122	12
FB-060M1-L2			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

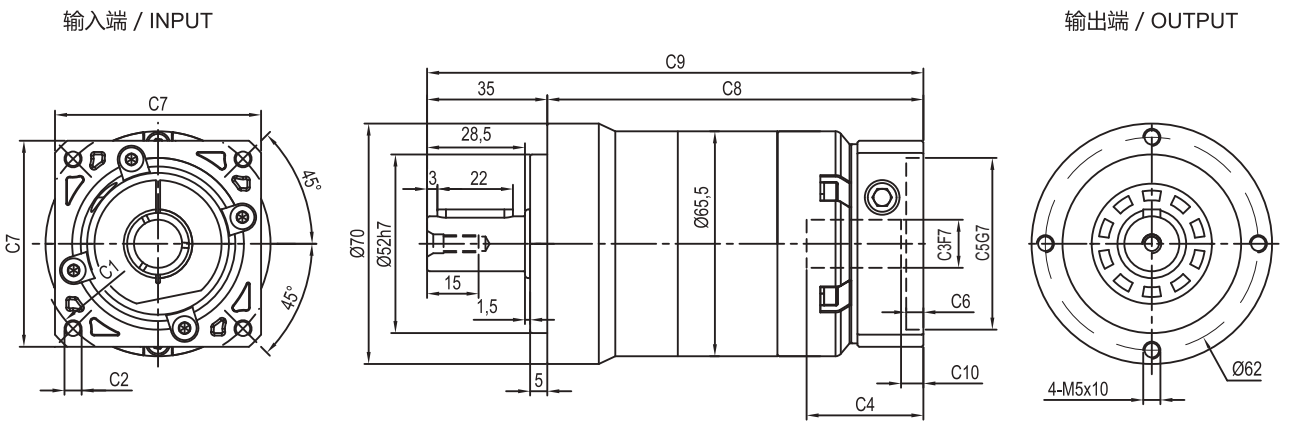
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

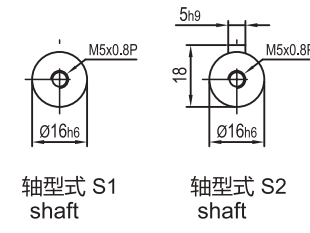
FE-070-L1



FE-070-L2



输出轴径/Output Diameter

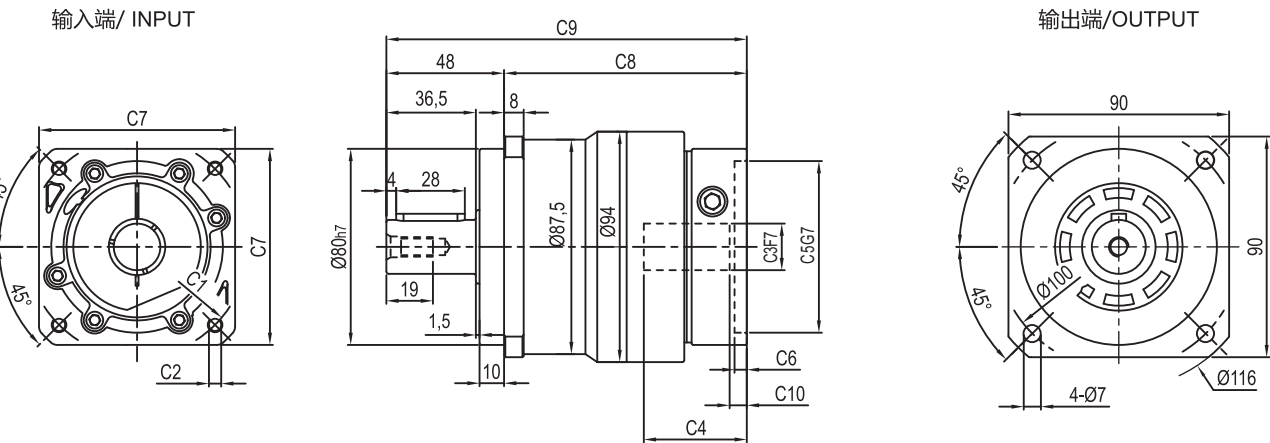


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-070-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	80.5	115.5	5.5
FE-070-L2								109.5	144.5	5.5
FE-070-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	80.5	115.5	5.5
FE-070-L2								109.5	144.5	5.5
FE-070M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	87	122	12
FE-070M1-L2			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

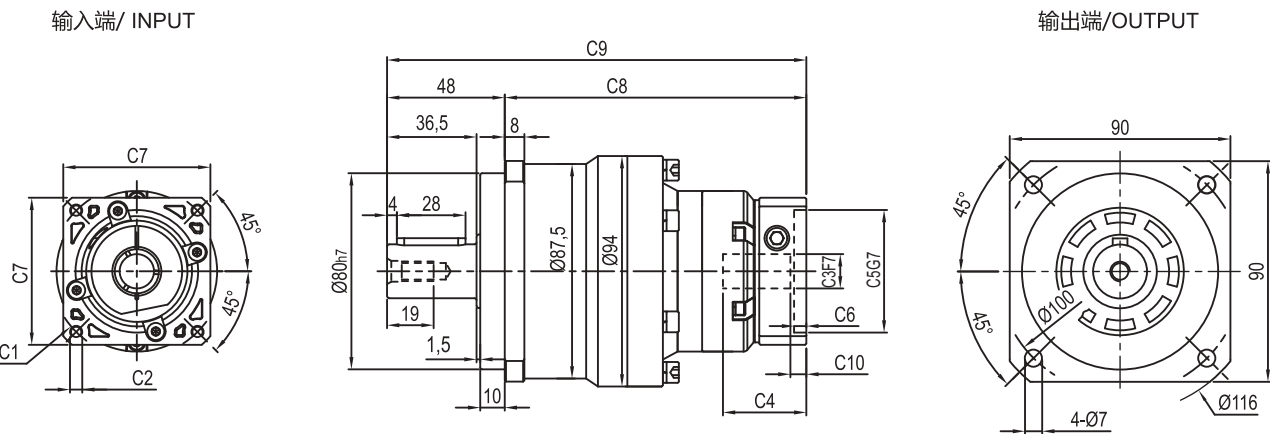
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

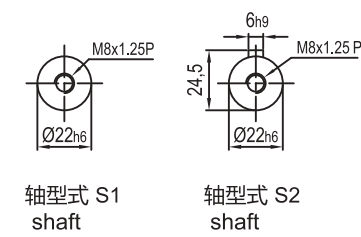
FB-090-L1



FB-090-L2



输出轴径/Output Diameter

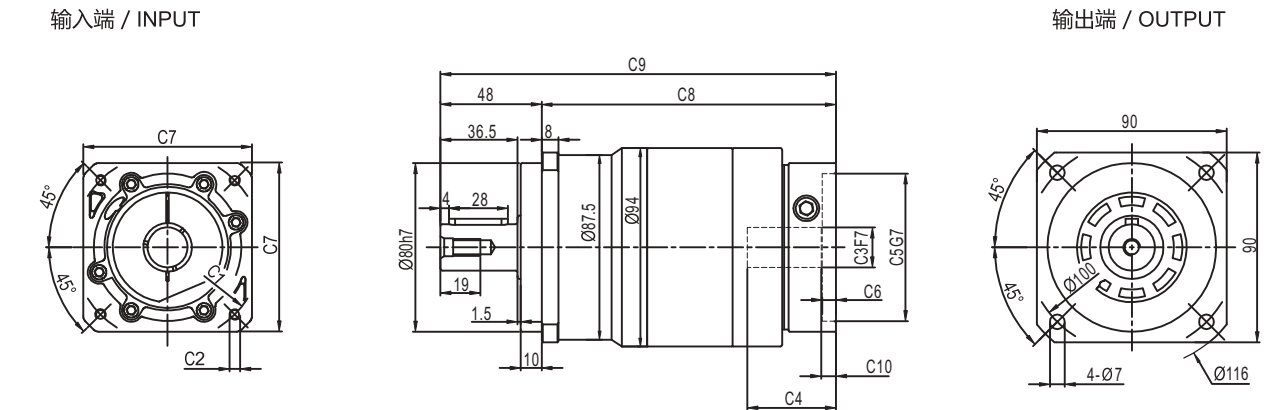


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-090-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	99	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	99	147	6
FB-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	114.5	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	117	165	19
FB-090-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	123	171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

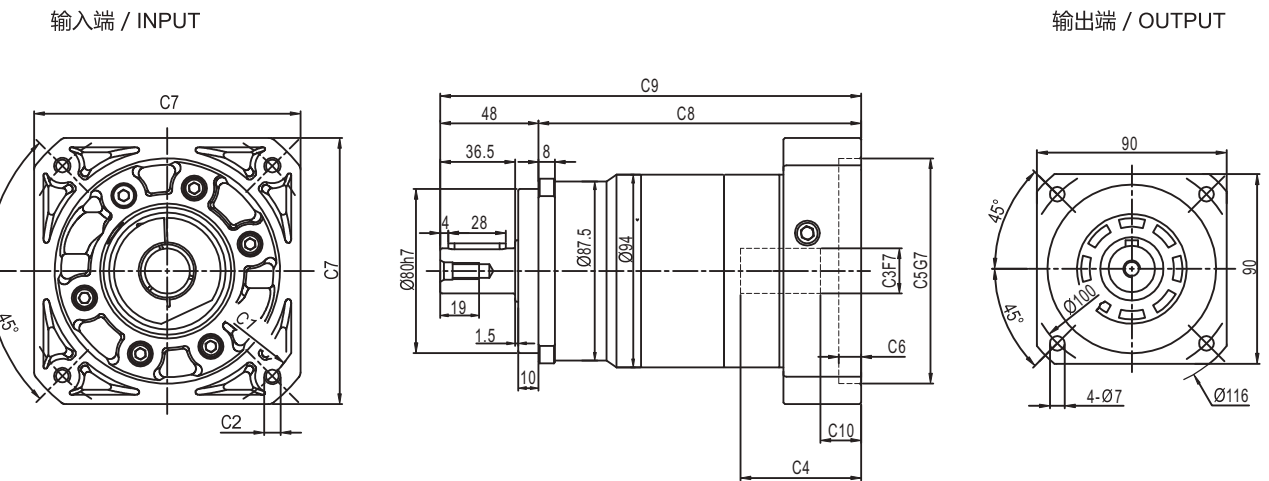
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

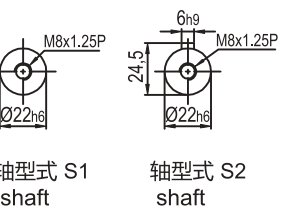
FB-090A-L2



FB-090A-L2



输出轴径/Output Diameter



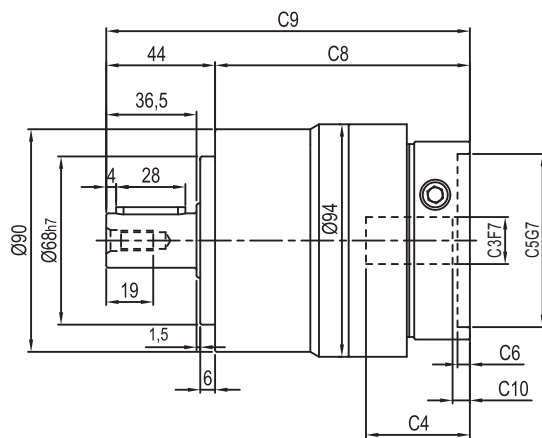
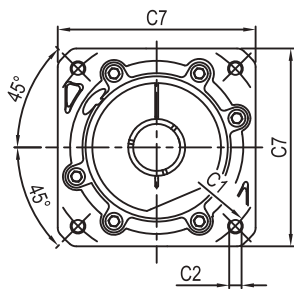
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-090A-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	139.5	187.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	139.5	187.5	6
FB-090AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	155	203	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	10	130	157.5	205.5	19

*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 customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

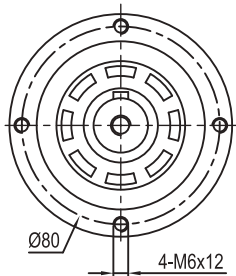
产品尺寸 / product dimension

FE-090-L1

输入端 / INPUT

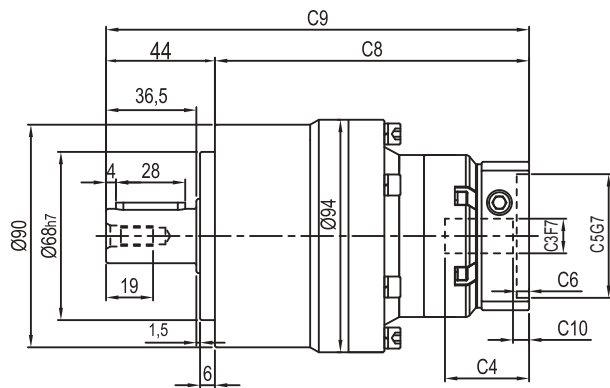
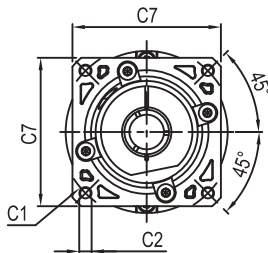


输出端 / OUTPUT

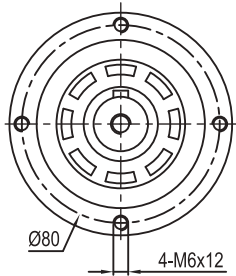


FE-090-L2

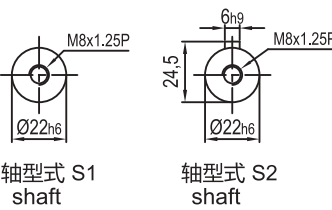
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



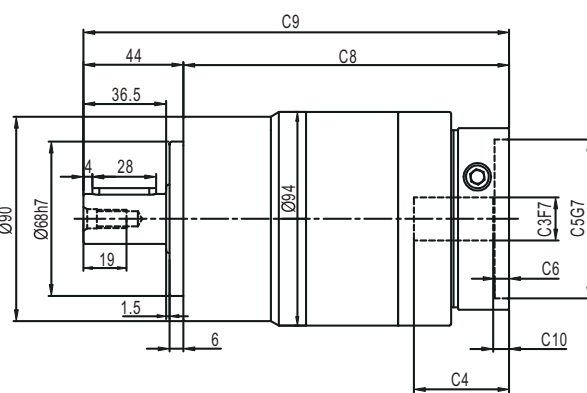
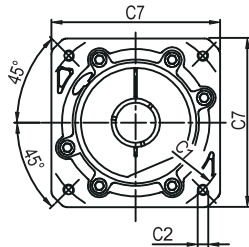
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-090-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	103	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	103	147	6
FE-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	118.5	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	121	165	19
FE-090-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	127	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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

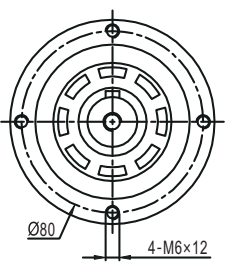
产品尺寸 / product dimension

FE-090A-L2

输入端/INPUT

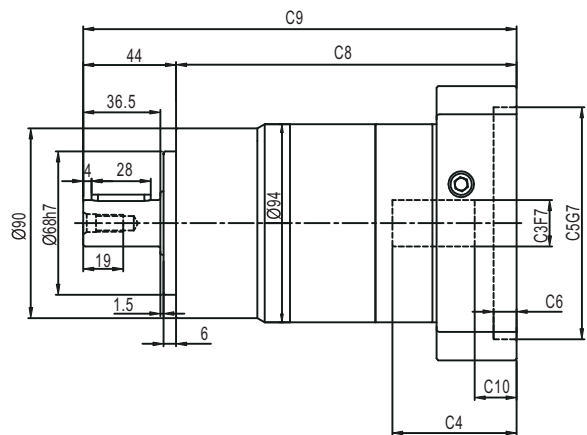
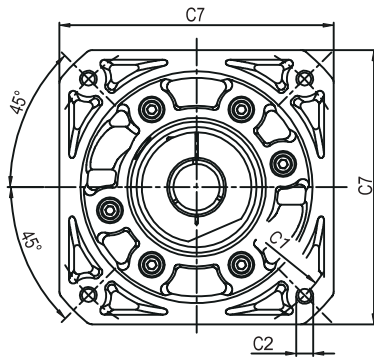


输出端/ OUTPUT

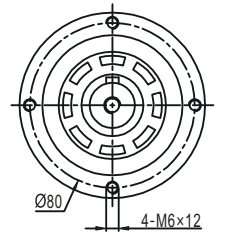


FE-090A-L2

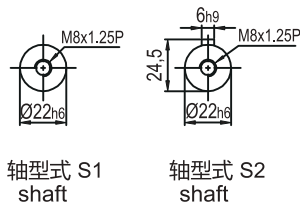
输入端/ INPUT



输出端/OUTPUT



输出轴径/Output Diameter

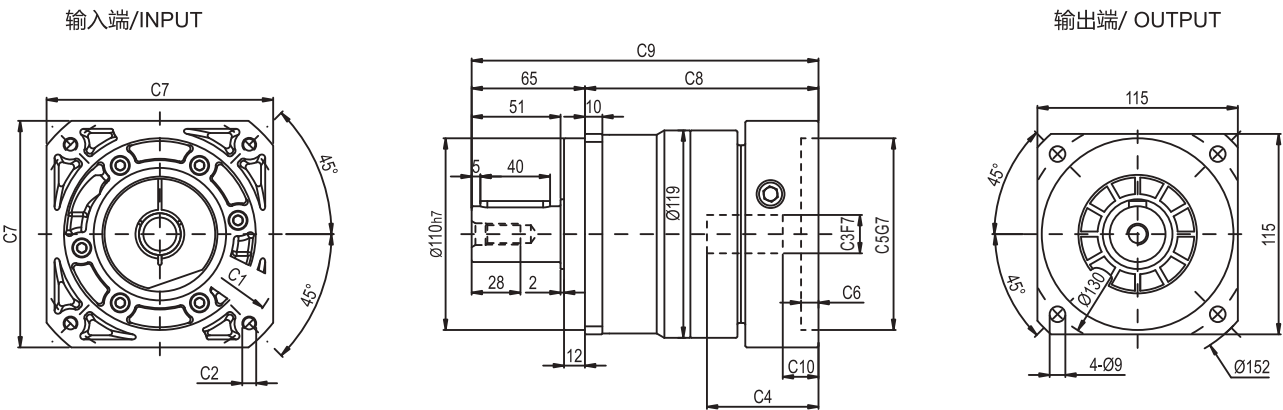


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-090A-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	143.5	187.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	143.5	187.5	6
FE-090AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	159	203	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	10	130	161.5	205.5	19

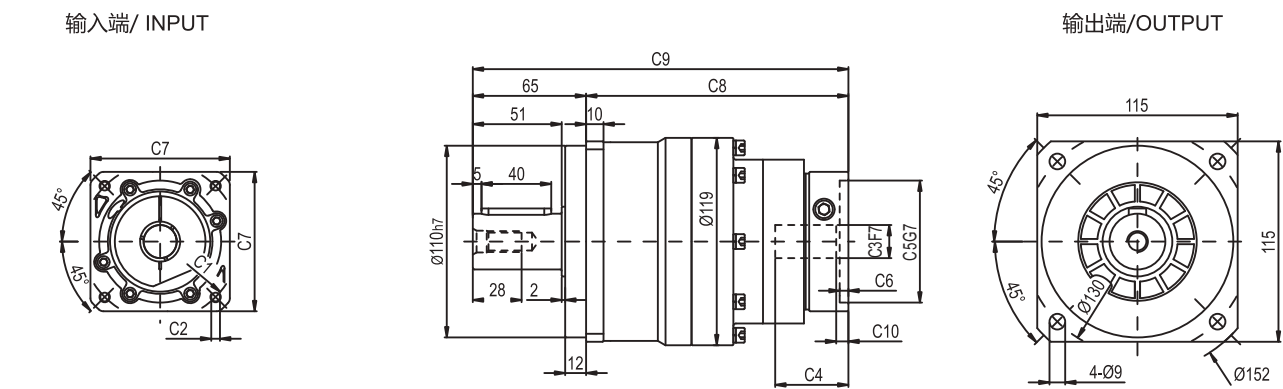
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

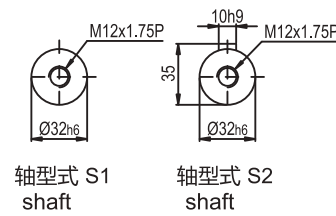
FB-115-L1



FB-115-L2



输出轴径/Output Diameter

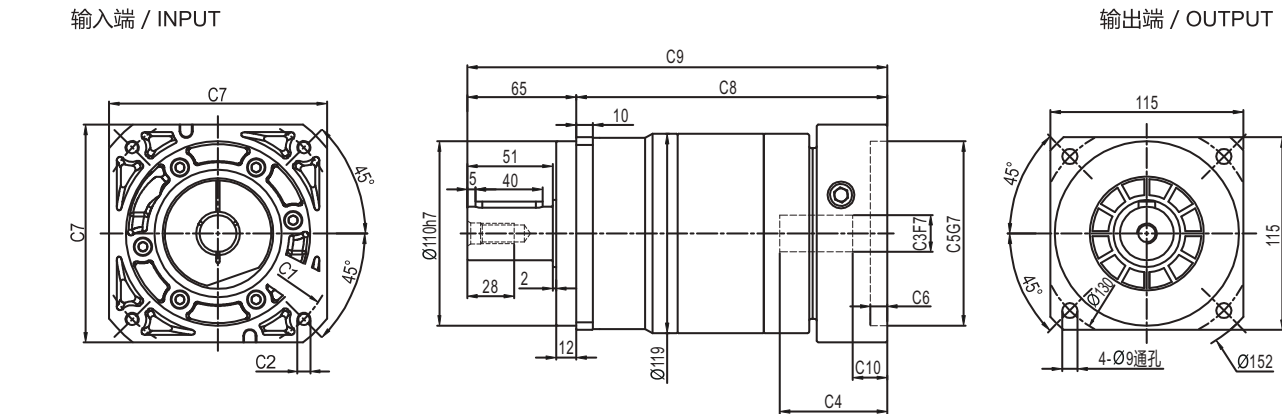


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-115-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	134	199	19.5
FB-115M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	151.5	216.5	28
FB-115-L2	Ø90	4-M5x12, 4-M6x14	Ø19	42	Ø70	6.5	80	150.5	215.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	150.5	215.5	6
FB-115M1-L2	Ø115	4-M8x20	Ø19,Ø22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

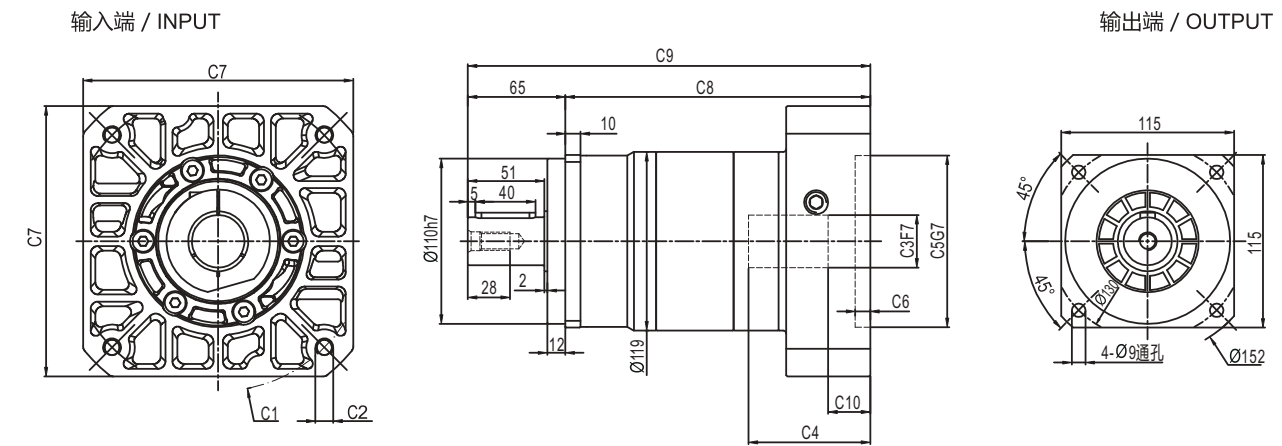
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1: Limit hole (Version number)

产品尺寸 / product dimension

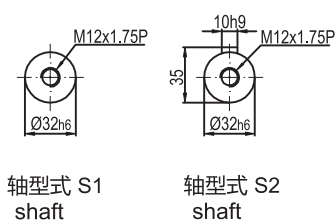
FB-115A-L2



FB-115A-L2



输出轴径/Output Diameter



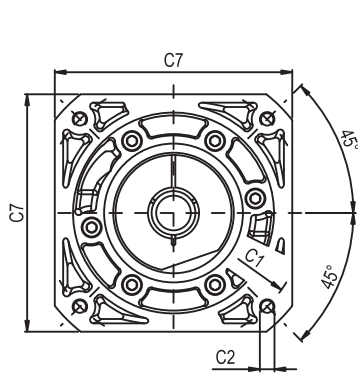
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-115A-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	185.5	205.5	19.5
FB-115AM1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	203	268	28

*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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1: Limit hole (Version number)

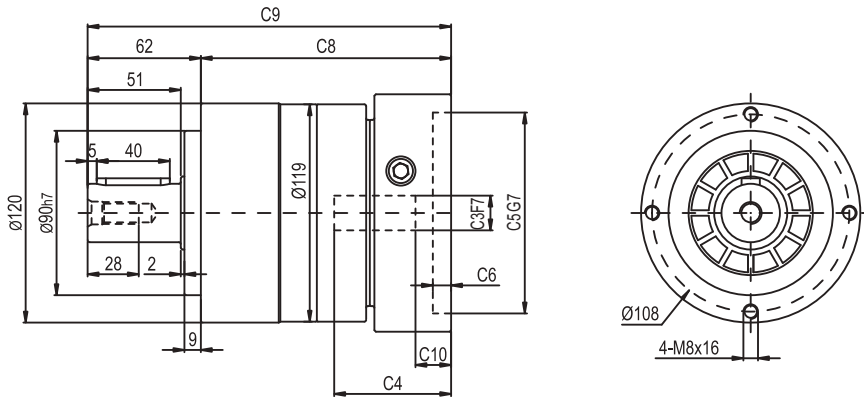
产品尺寸 / product dimension

FE-120-L1

输入端 / INPUT

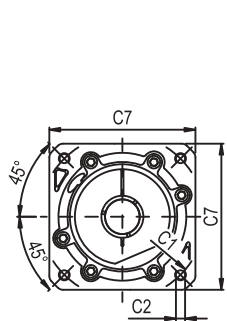


输出端 / OUTPUT

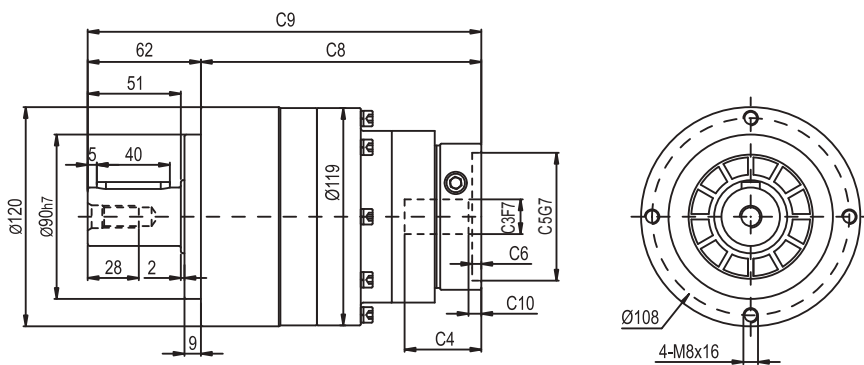


FE-120-L2

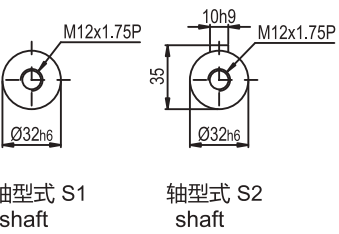
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



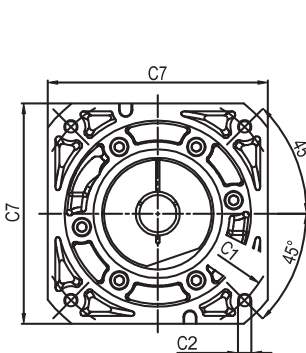
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-120-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	137	199	19.5
FE-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	154.5	216.5	28
FE-120-L2	Ø90	4-M5x12, 4-M6x14	Ø19	42	Ø70	6.5	80	153.5	215.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	153.5	215.5	6
FE-120M1-L2	Ø115	4-M8x20	Ø19,Ø22	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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

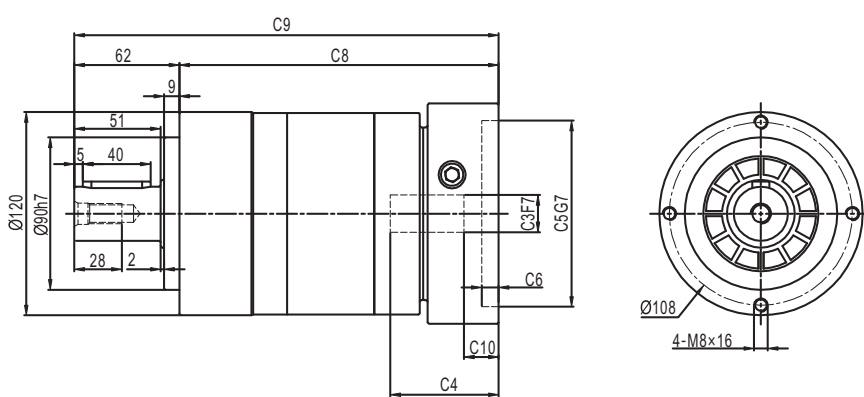
产品尺寸 / product dimension

FE-120A-L2

输入端 / INPUT

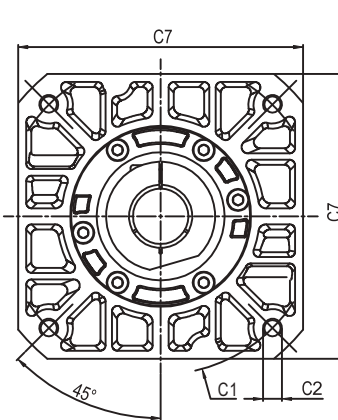


输出端 / OUTPUT

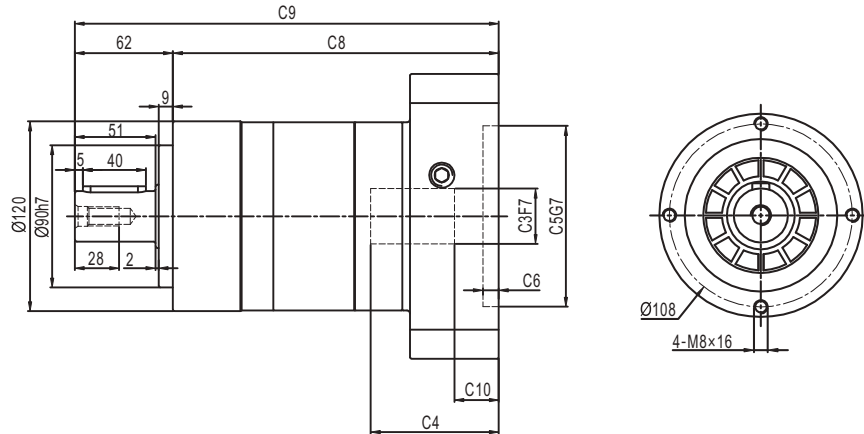


FE-120A-L2

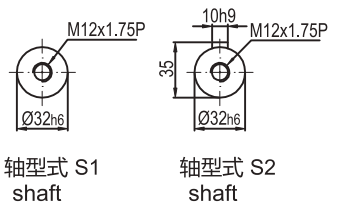
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



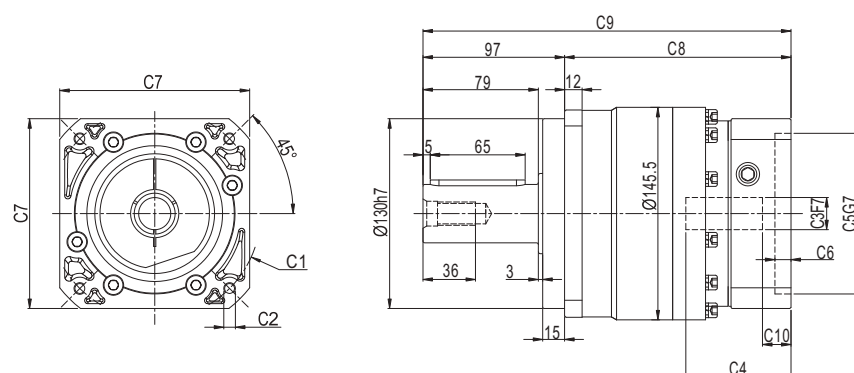
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-120A-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	188.5	205.5	19.5
FE-120AM1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	206	268	28

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

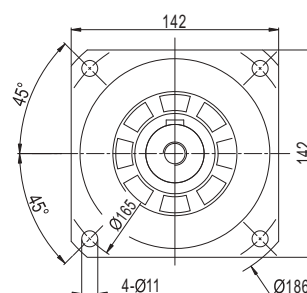
产品尺寸 / product dimension

FB-142-L1

输入端 / INPUT

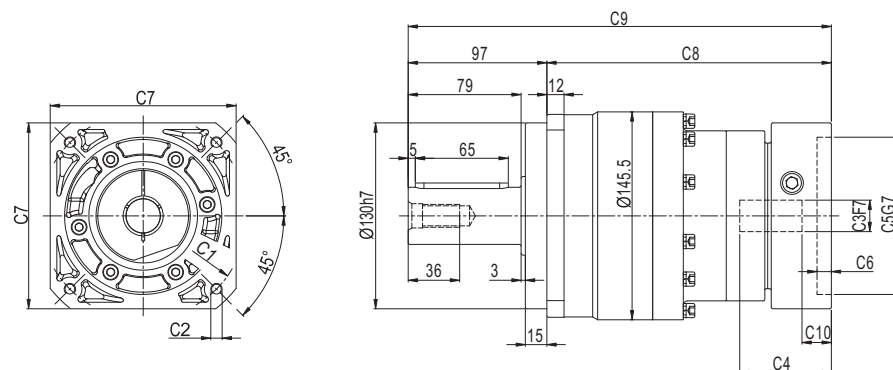


输出端 / OUTPUT

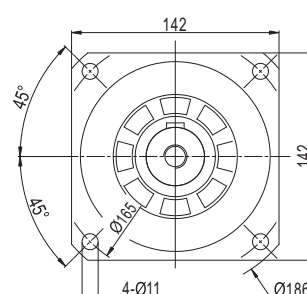


FB-142-L2

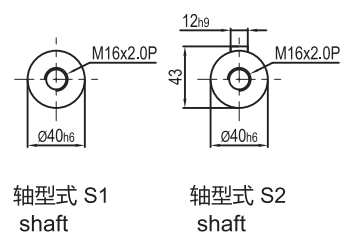
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



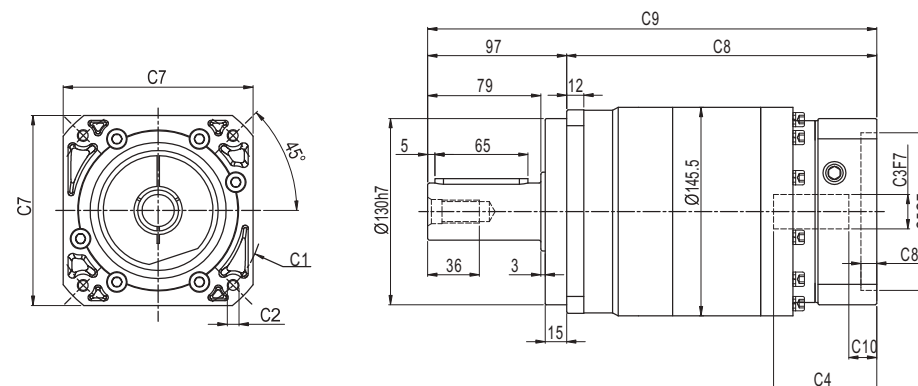
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-142-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	155	252	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	165	262	25
FB-142-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	199	296	19.5
FB-142M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	216.5	313.5	28

*C1~C7是公制标准马达连接板的尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

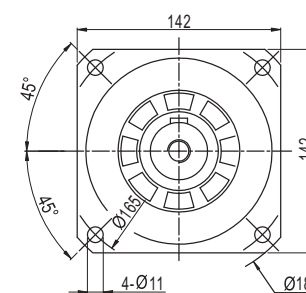
产品尺寸 / product dimension

FB-142A-L2

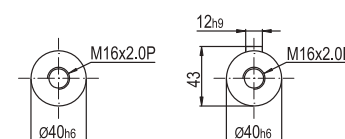
输入端/ INPUT



输出端/OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

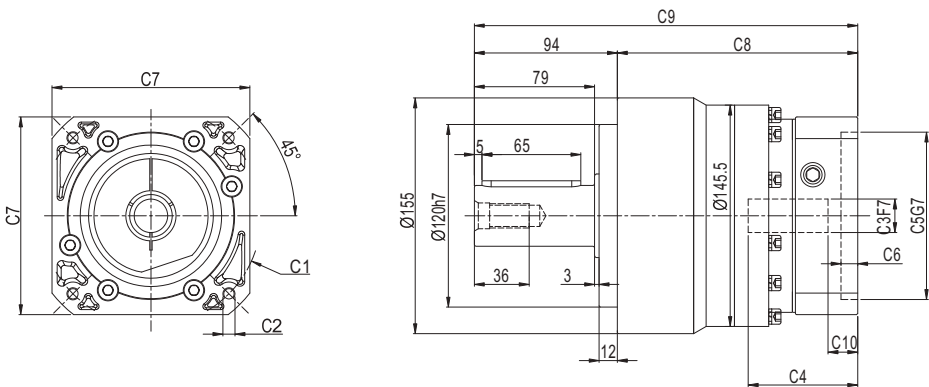
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-142A-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	216.5	313.5	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	226.5	323.5	25.5

*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~C7 are motor(metric standard) specific dimensions, which could be customized.

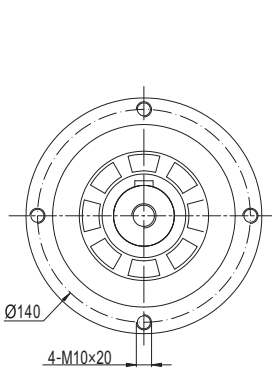
产品尺寸 / product dimension

FE-155-L1

输入端 / INPUT

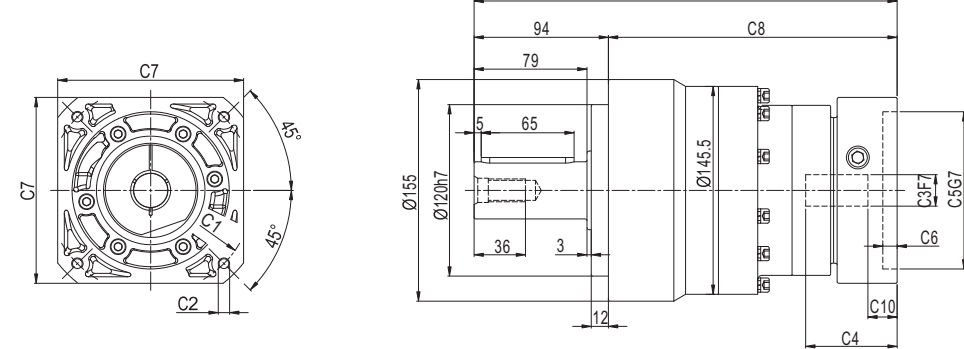


输出端 / OUTPUT

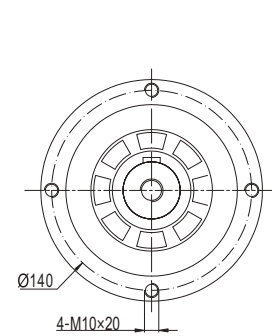


FE-155-L2

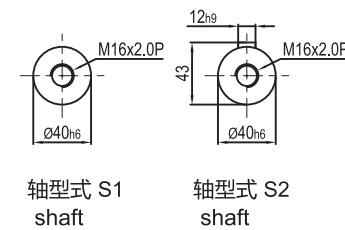
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1 shaft
轴型式 S2 shaft

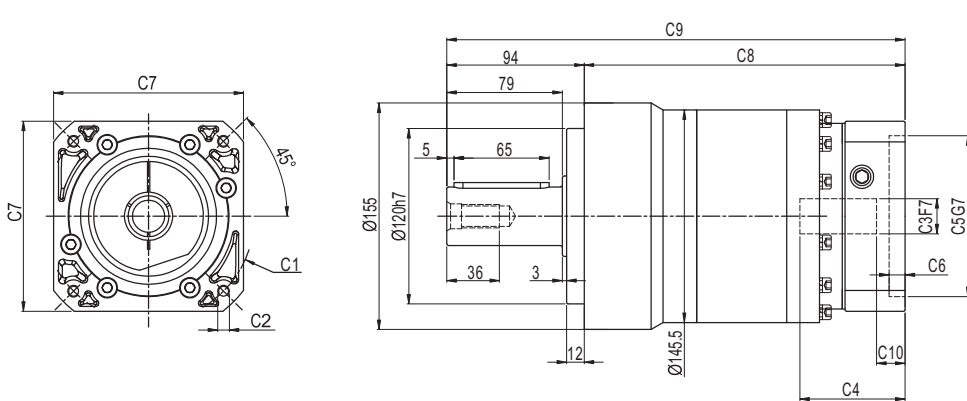
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-155-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	158	252	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	168	262	25
FE-155-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	202	296	19.5
FE-155M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	219.5	313.5	28

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

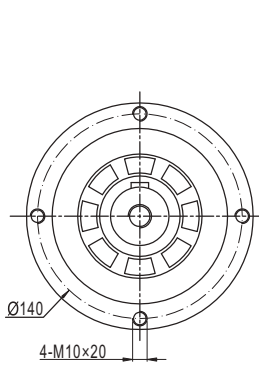
产品尺寸 / product dimension

FE-155A-L2

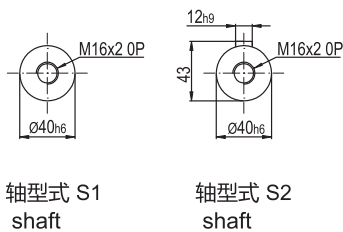
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1 shaft
轴型式 S2 shaft

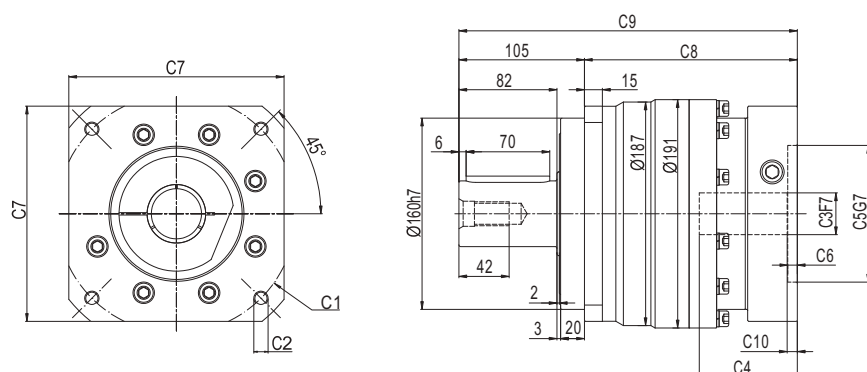
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-155A-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	219.5	313.5	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	229.5	323.5	25

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*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.

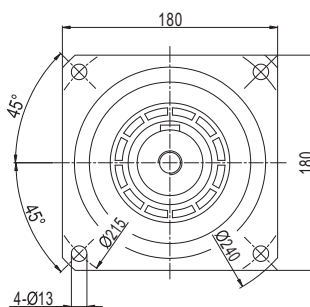
产品尺寸 / product dimension

FB-180-L1

输入端 / INPUT

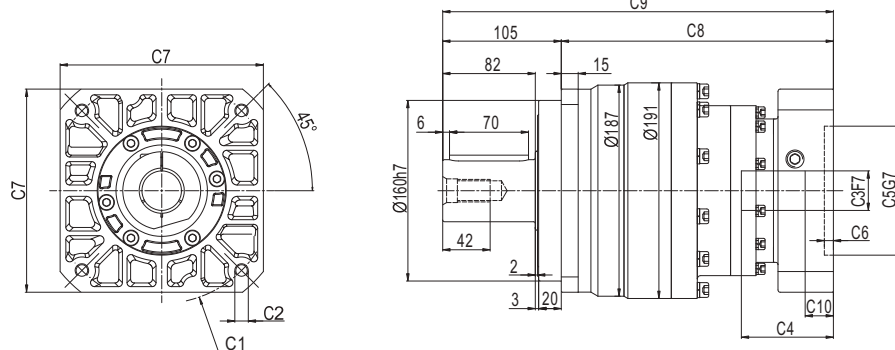


输出端 / OUTPUT

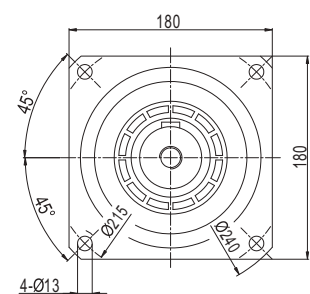


FB-180-L2

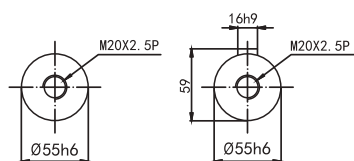
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-180-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-180-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

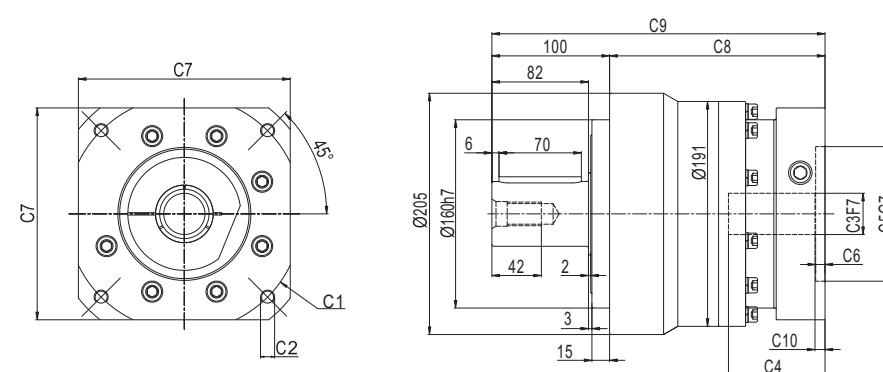
*C1~C7是公制标准马达连接板之尺寸, 可根据客户要求单独定做。

*C1~C7 are motor(metric standard) specific dimensions, which could be customized.

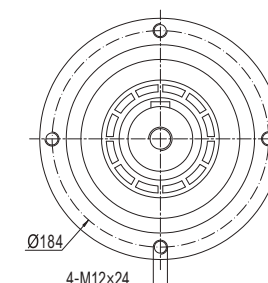
产品尺寸 / product dimension

FE-205-L1

输入端 / INPUT

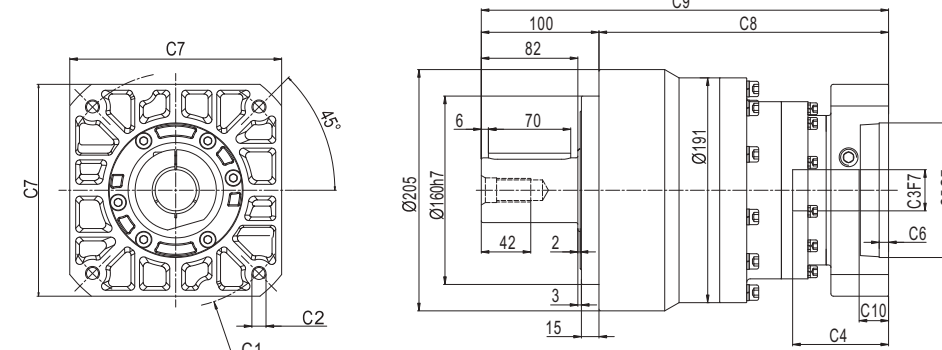


输出端 / OUTPUT

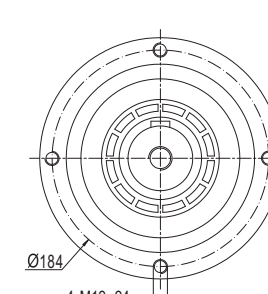


FE-205-L2

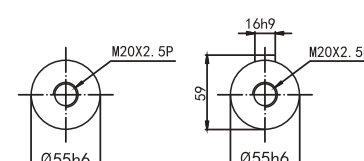
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter

轴型式 S1
shaft轴型式 S2
shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-205-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-205-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	25.5

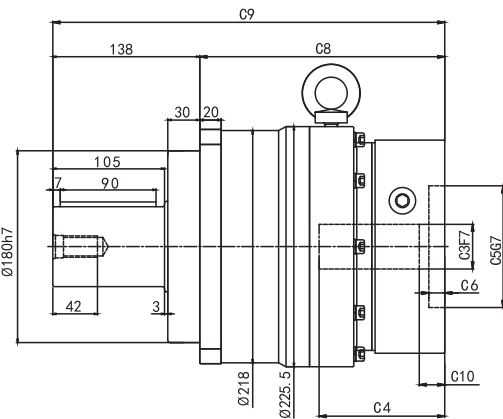
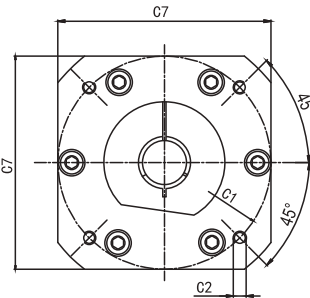
*C1~C7是公制标准马达连接板之尺寸, 可根据客户要求单独定做。

*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.

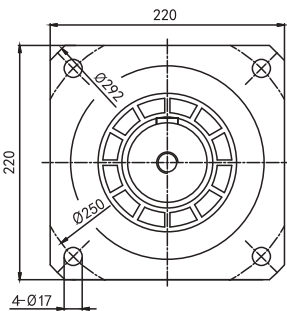
产品尺寸 / product dimension

FB-220-L1

输入端 / INPUT

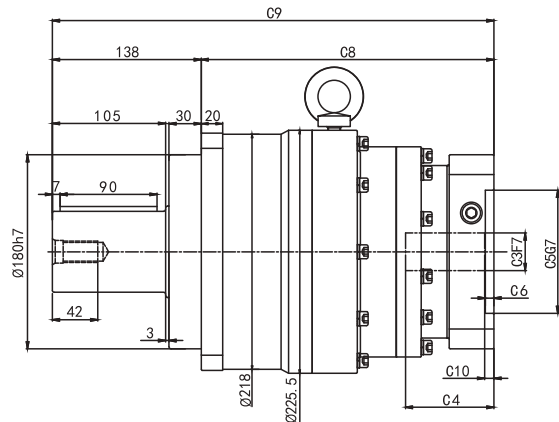
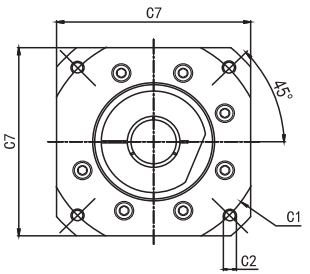


输出端 / OUTPUT

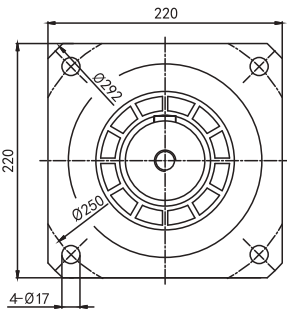


FB-220-L2

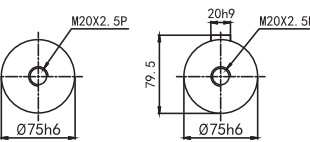
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

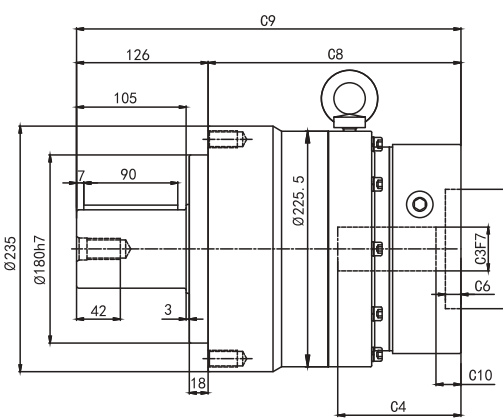
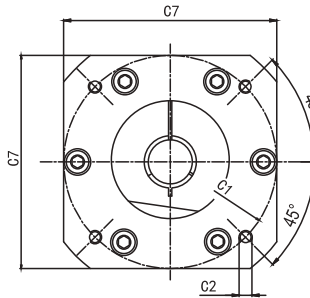
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FB-220-L1	Ø200	4-M12x28	Ø35,Ø42	118	Ø114.3	15	200	230	368	24
	Ø215	4-M12x30	Ø38	108	Ø180	8	200	220	358	11.5
	Ø235	4-M12x30	Ø42,Ø55	118	Ø200	10	220	230	368	24
FB-220-L2	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	271.5	409.5	8.5
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	307	445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

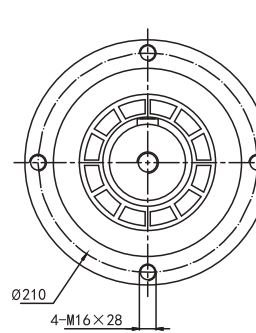
产品尺寸 / product dimension

FE-235-L1

输入端 / INPUT

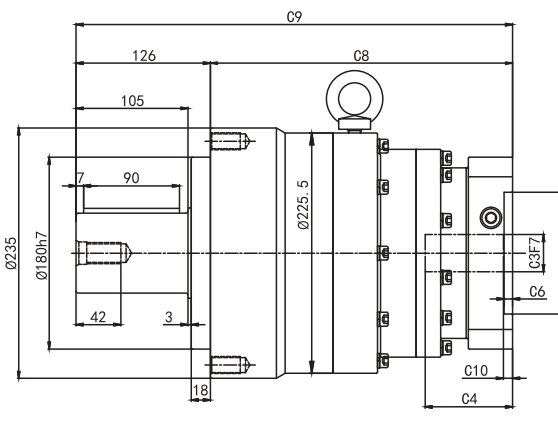
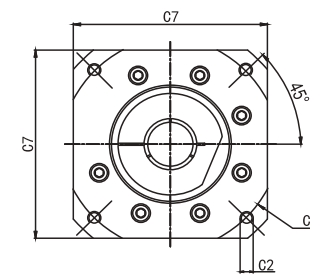


输出端 / OUTPUT

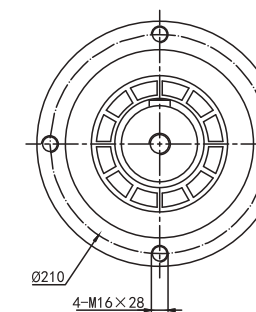


FE-235-L2

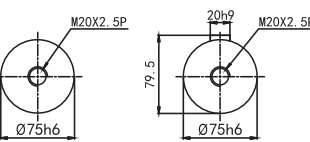
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FE-235-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-235-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 customized.

品质源三凯 口碑自然来



SUCCESS BREEDS
SUCCESS

FBR/FER
SERIES

PRECISION PLANETARY
GEAR BOX

精密行星减速机

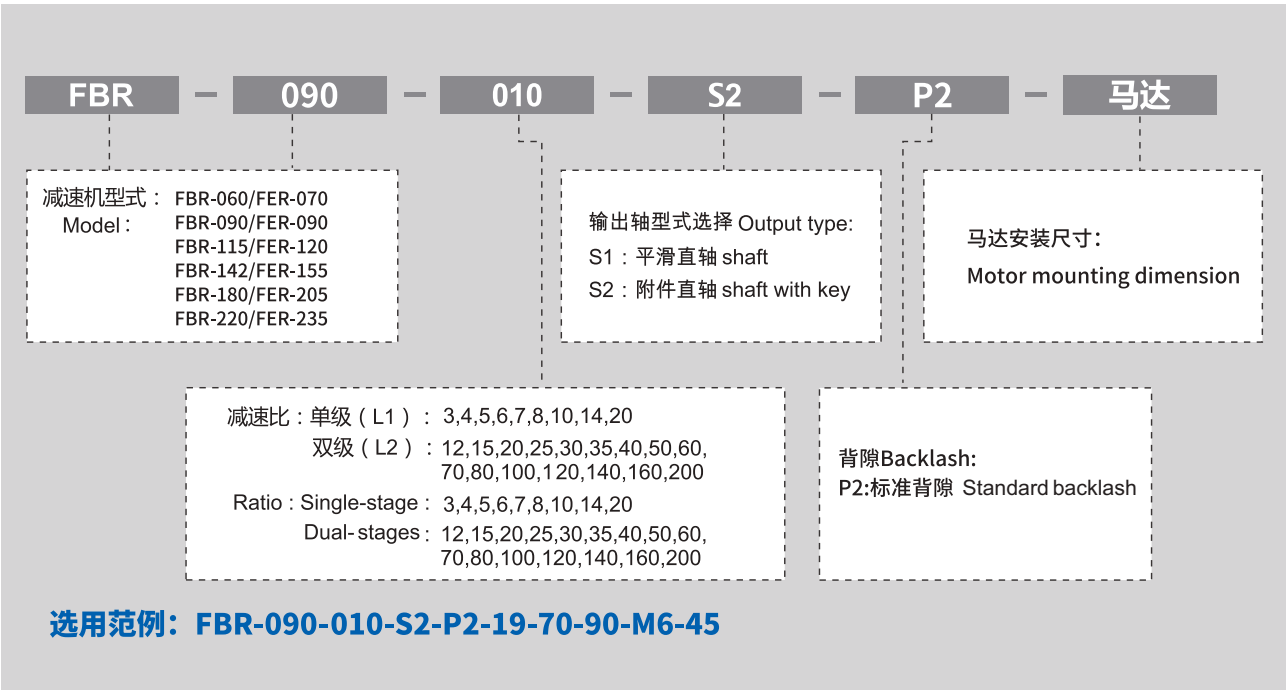
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SKGR三凯

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

FBR/FER系列

型号说明 / model description



技术参数 / technical specification

规 格 Model	级 数 Stage	减 速 比 ¹ Ratio	FBR060 FER070	FBR090 FER090	FBR090A FER090A	FBR115 FER120	FBR115A FER120A	FBR142 FER155	FBR142A FER155A	FBR180 FER205	FBR220 FER235	
额定输出力矩T _{2N} Rated output torque	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	130	208	208	342	342	588	1,140
			15	55	130	130	208	208	342	342	588	1,140
			20	50	140	140	290	290	542	542	1,050	1,700
			25	60	160	160	330	330	650	650	1,200	2,000
			30	55	130	130	208	208	342	342	588	1,140
			35	60	160	160	330	330	650	650	1,200	2,000
			40	50	140	140	290	290	542	542	1,050	1,700
			50	60	160	160	330	330	650	650	1,200	2,000
			60	55	150	150	310	310	600	600	1,100	1,900
			70	60	160	160	330	330	650	650	1,200	2,000
			80	50	140	140	290	290	542	542	1,050	1,700
100	60		160	160	330	330	650	650	1,200	2,000		
120	—	150	150	310	310	600	600	1,100	1,900			
140	—	140	140	300	300	550	550	1,100	1,800			
160	—	120	120	260	260	500	500	1,000	1,600			
200	—	100	100	230	230	450	450	900	1,500			
最大输出力矩T _{2B} /Max.output torque	Nm	1,2	3倍额定输出力矩 3 times the rated output torque									
额定输入转速n ₁ /Rated input speed	rpm	1,2	3~200	5,000	4,000	4,000	4,000	4,000	3,000	3,000	3,000	2,000
最大输入转速n _{1B} /Max.input speed	rpm	1,2	3~200	10,000	8,000	8,000	8,000	8,000	6,000	6,000	6,000	4,000
标准背隙P2/Precision backlash	arcmin	1	3~20	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤10
		2	12~200	≤12	≤12	≤12	≤12	≤12	≤12	≤12	≤12	≤12
扭转刚性/Torsional rigidity	Nm/arcmin	1,2	3~200	7	14	14	25	25	50	50	145	225
容许径向力F _{2B} ² /Allowable radial force	N	1,2	3~200	1,530	3,250	3,250	6,700	6,700	9,400	9,400	14,500	50,000
容许轴向力F _{2aB} ² /Allowable radial force	N	1,2	3~200	630	1,300	1,300	3,000	3,000	4,000	4,000	6,200	35,000
容许轴向力F _{2aB} ² /Allowable radial force	N	1,2	3~200	765	1,625	1,625	3,350	3,350	4,700	4,700	7,250	25,000
使用寿命/Life time	hr	1,2	3~200	20,000*								
效率η /Efficiency	%	1	3~20	≤95%								
		2	12~200	≤92%								
重量/Weight	kg	1	3~20	2.1	6.4	—	13	—	24.5	—	51	83
		2	12~200	2.5	7.8	8.46	14.2	18.2	27.5	34.3	54	95
使用温度/Operating temperature	°C	1,2	3~200	-10°C~+90°C								
润滑/lubrication		1,2	3~200	合成润滑油脂 Synthetic lubricating grease								
防护等级/Ingress protection		1,2	3~200	IP65								
安装方向/Mount position		1,2	3~200	任意方向 Any direction								
噪音值(n=3000rpm)/Noise level	dB	1,2	3~200	≤63	≤65	≤65	≤68	≤68	≤70	≤70	≤72	≤74

减速机转动惯量 Gearbox moment of inertia

规格 Model	级数 Stage	减速比 ¹ Ratio	FBR060 FER070	FBR090 FER090	FBR090A FER090A	FBR115 FER120	FBR115A FER120A	FBR142 FER155	FBR142A FER155A	FBR180 FER205	FBR220 FER235
转动惯量J _i Moment of inertia	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	2.25	6.84	6.84	23.4	23.4	68.9
		50	0.07	0.31	1.87	1.87	6.25	6.25	21.8	21.8	65.6
		60	0.07	0.35	2.25	2.25	6.84	6.84	23.4	23.4	68.9
		70~100	0.07	0.31	1.87	1.87	6.25	6.25	21.8	21.8	65.6
		120~200	0.07	0.31	1.87	1.87	6.25	6.25	21.8	21.8	65.6

1.减速比Ratio(i=N_{in}/N_{out})

* 连续运转降低使用寿命二分之一。

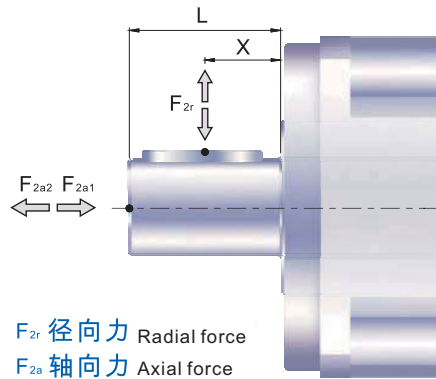
The lifetime will be shortened by half under continuous operation.

2.输出转速 100rpm 时，作用于输出轴中心位置。

When the output speed is 100rpm, it applies on the center of the output shaft.

减速机输出轴之容许径向力及轴向力

ALLOWABLE RADIAL AND AXIAL FORCES ON THE OUTPUT SHAFT OF THE GEAR REDUCER

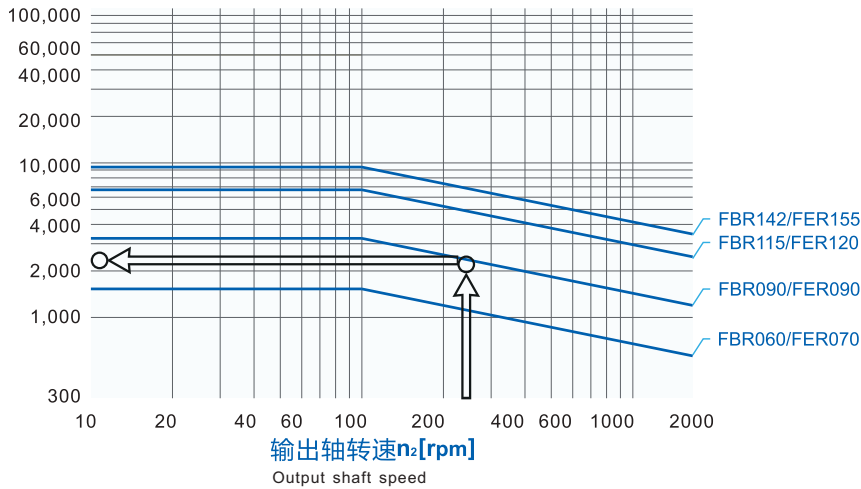


减速机输出轴所能承受之最大径向力及轴向力。端视内部支撑轴承之设计，减速机采用大尺寸的轴承及较大跨距的设计，其能承受更大的径向及轴向负荷。

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

容许径向力F_{2rB}[N]施力于轴中心位置

Permissible radial force F_{2rB} [N] apply force to the center of the shaft



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

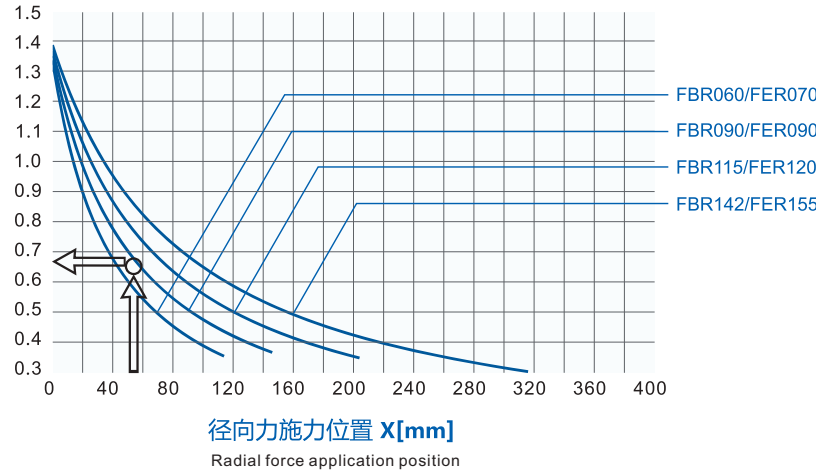
When the radial force F_{2r} is applied to the center of the shaft, i.e. X=1/2xL, the allowable radial force F_{2rB} that can be withstood by different specifications of reducers with a service life of 20,000hr* under different output speeds is as follows:

F_{2a1B}=0.2x F_{2rB}

F_{2a2B}=0.1x F_{2rB}

位置负荷系数K_b

Positional load coefficient



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，查出位置负荷系数K_b，在代入下列公式求出容许

When the radial force F_{2r} is not in the center of the shaft, the closer to the gearbox, that is, X<1/2xL, the allowable radial force that can be borne becomes larger, and the farther away from the reducer, i.e., X>1/2xL, the allowable force that can be borne becomes smaller.

径向力: Radial force

F_{2rB}'=K_bx F_{2rB}

轴向力: Axial force

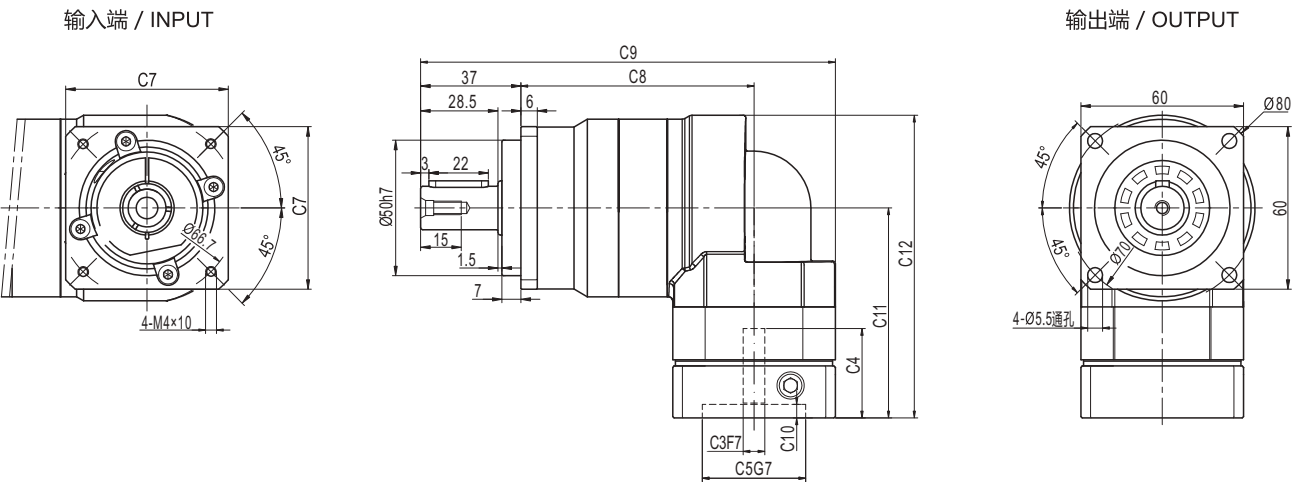
F_{2a1B}'=0.2x F_{2rB}'

F_{2a2B}'=0.1x F_{2rB}'

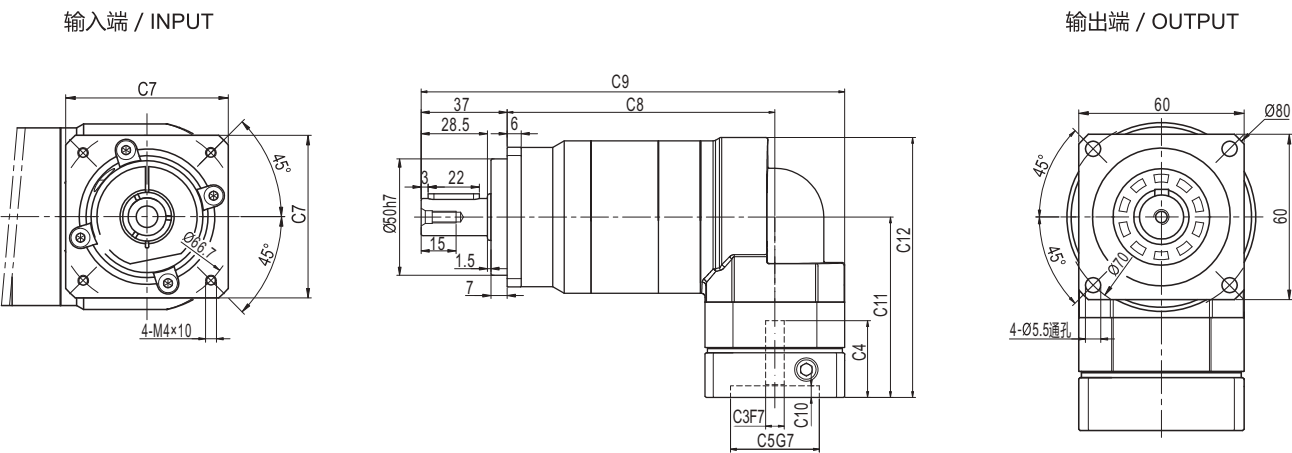
* 连续运转降低使用寿命二分之一。The lifetime will be shortened by half under continuous operation.

产品尺寸 / product dimension

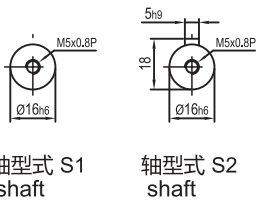
FBR-060-L1



FBR-060-L2



输出轴径/Output Diameter

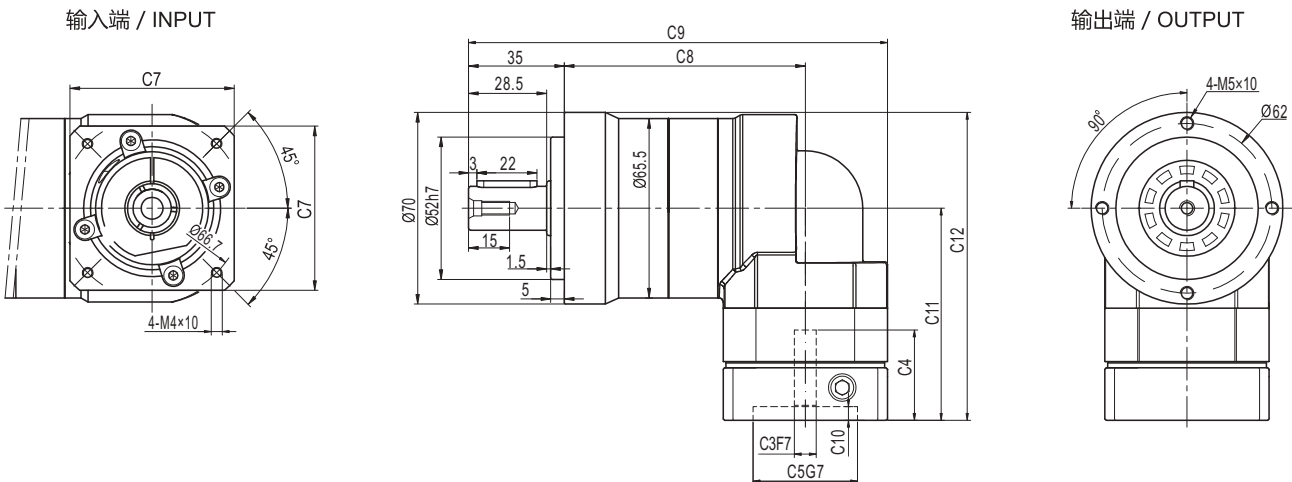


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-060-L 1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	86	153	5.5	77.5	111.75
FBR-060-L 2								115	182			
FBR-060-L 1	Ø70	4-M4x10, 4-M5x12	Ø11, Ø14	33	Ø50	5	60	86	153	5.5	77.5	111.75
FBR-060-L 2								115	182			
FBR-060M1-L 1	Ø90	4-M5x12, 4-M6x14	Ø19	42.5	Ø70	6.5	80	86	163	12	87	121.25
FBR-060M1-L 2								115	192			

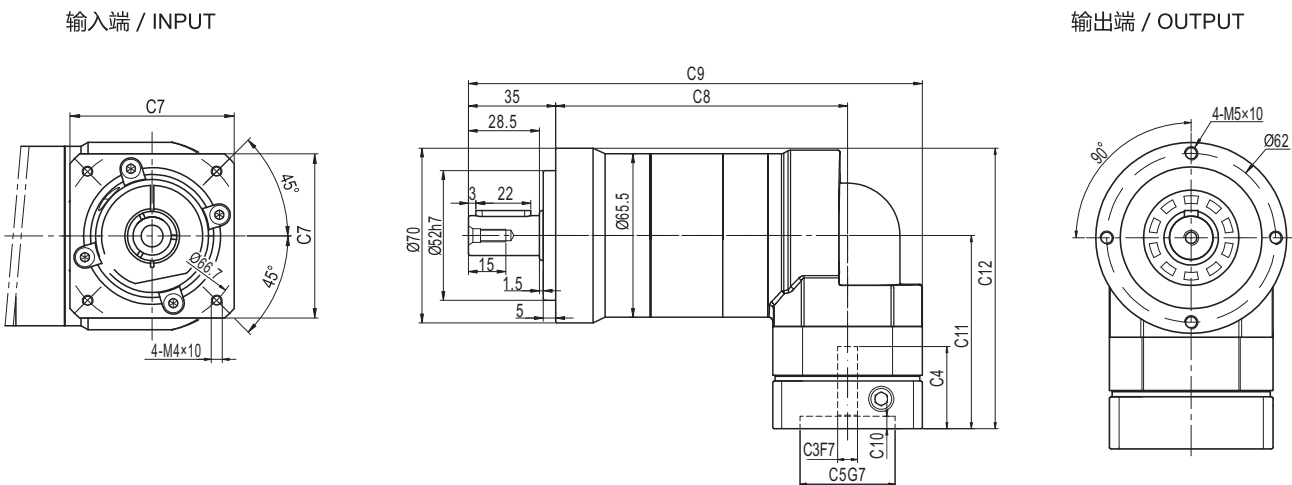
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

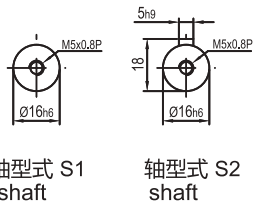
FER-070-L1



FER-070-L2



输出轴径/Output Diameter



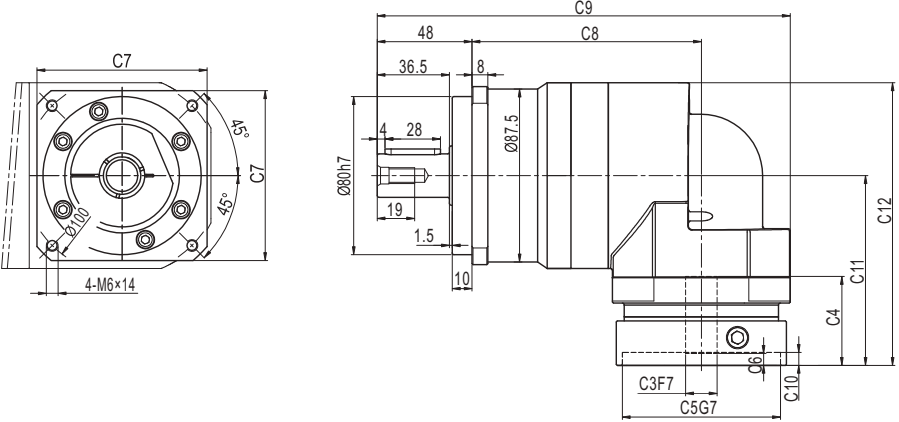
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-070-L 1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	88	153	5.5	77.5	112.5
FER-070-L 2								117	182			
FER-070-L 1	Ø70	4-M4x10, 4-M5x12	Ø11, Ø14	33	Ø50	5	60	88	153	5.5	77.5	112.5
FER-070-L 2								117	182			
FER-070M1-L 1	Ø90	4-M5x12, 4-M6x14	Ø19	42.5	Ø70	6.5	80	88	163	12	87	122
FER-070M1-L 2								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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

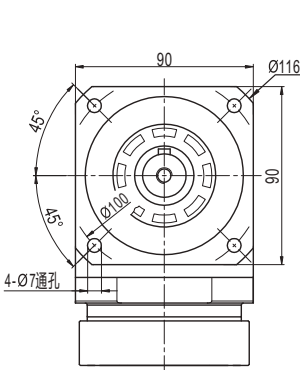
产品尺寸 / product dimension

FBR-090-L1

输入端 / INPUT

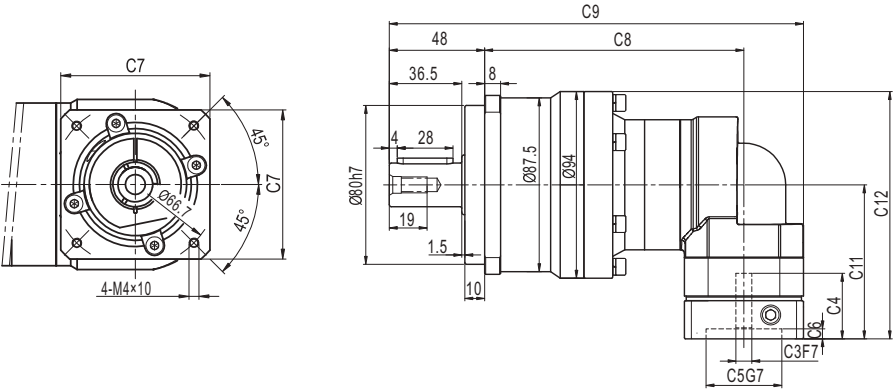


输出端 / OUTPUT

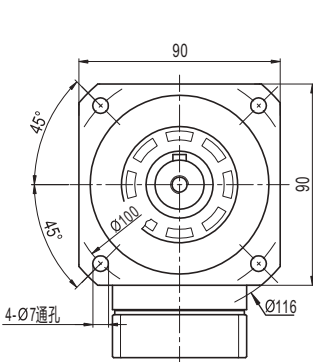


FBR-090-L2

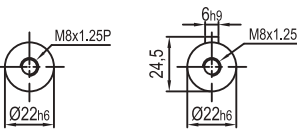
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

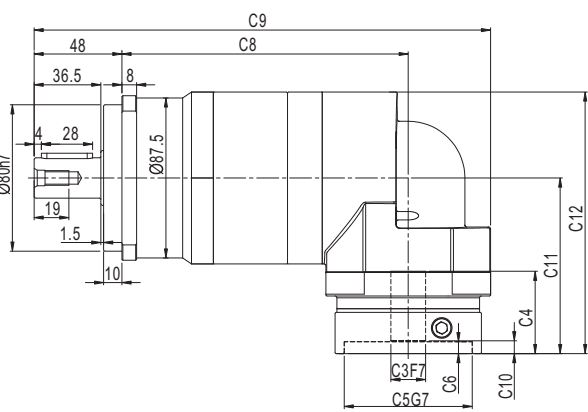
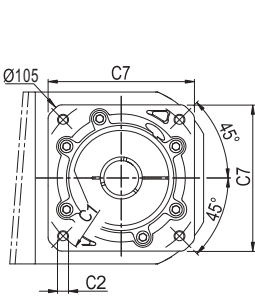
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-090-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	116	209	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	116	209	6	96	143
FBR-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	116	214	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	116	229	19	120	167
FBR-090-L2	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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

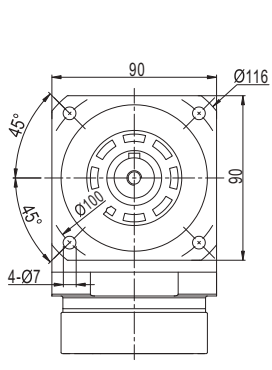
产品尺寸 / product dimension

FBR-090A-L2

输入端 / INPUT

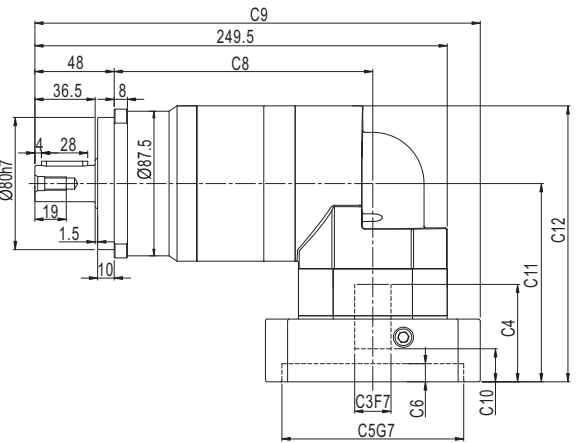
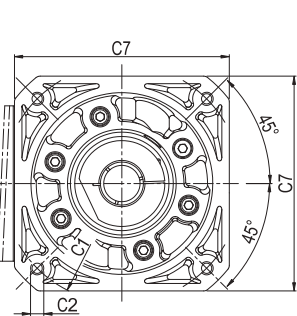


输出端 / OUTPUT

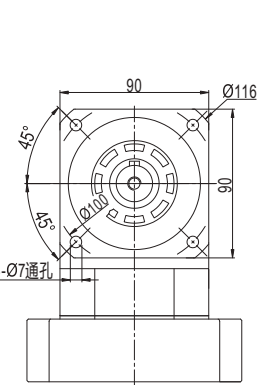


FBR-090A-L2

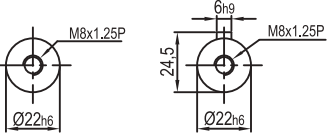
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

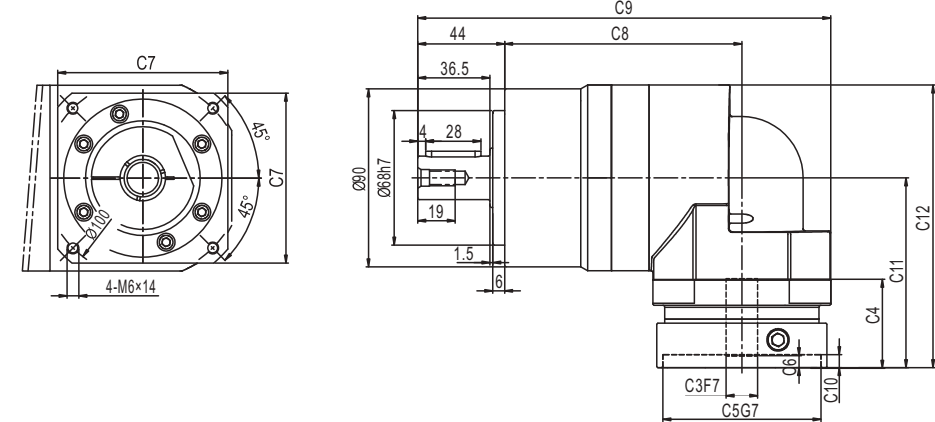
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-090A-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	156.5	249.5	7	96	141
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	156.5	249.5	6	96	141
FBR-090AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	156.5	254.5	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	10	130	156.5	269.5	19	120	167

*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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

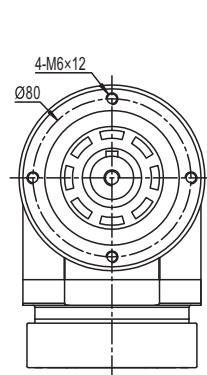
产品尺寸 / product dimension

FER-090-L1

输入端 / INPUT

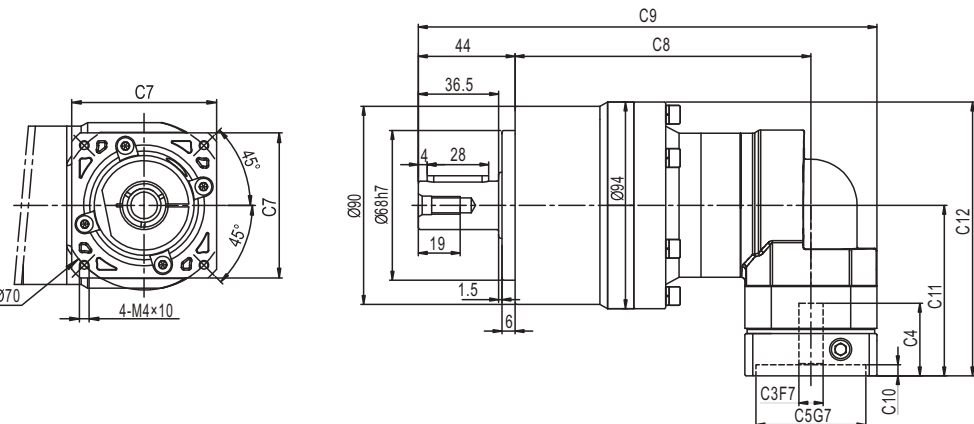


输出端 / OUTPUT

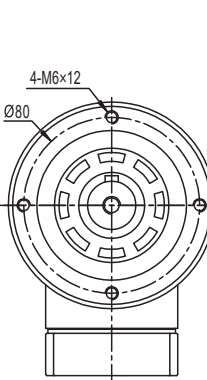


FER-090-L2

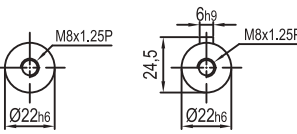
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

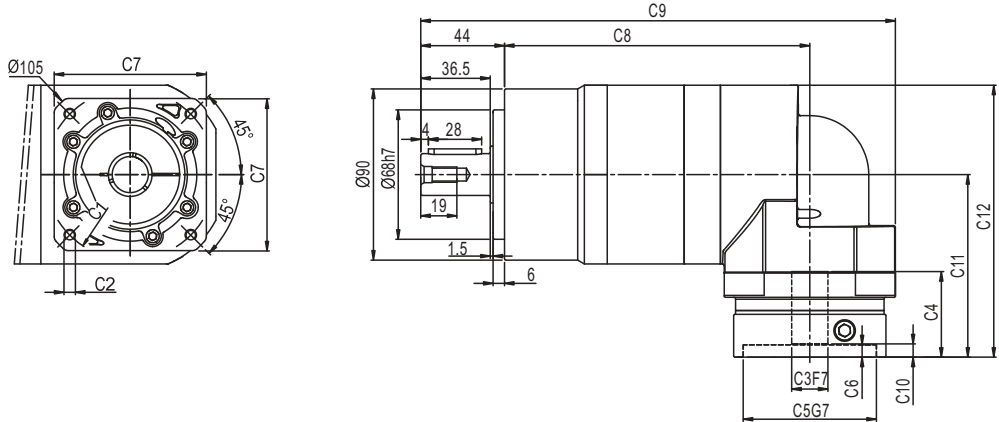
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-090-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	120	209	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	120	209	6	96	143
FER-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	120	214	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	120	229	19	120	167
FER-090-L2	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 dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

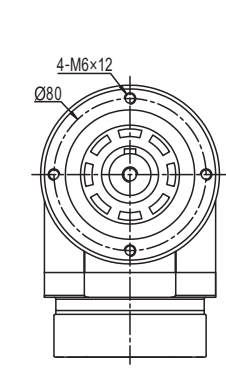
产品尺寸 / product dimension

FER-090A-L2

输入端 / INPUT

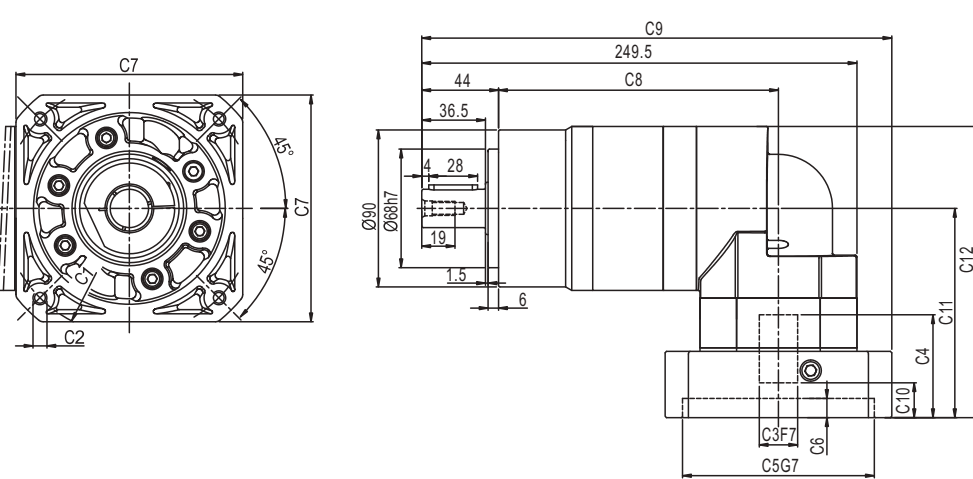


输出端 / OUTPUT

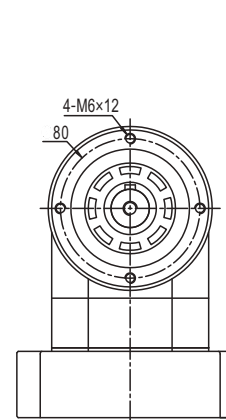


FER-090A-L2

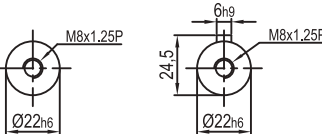
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

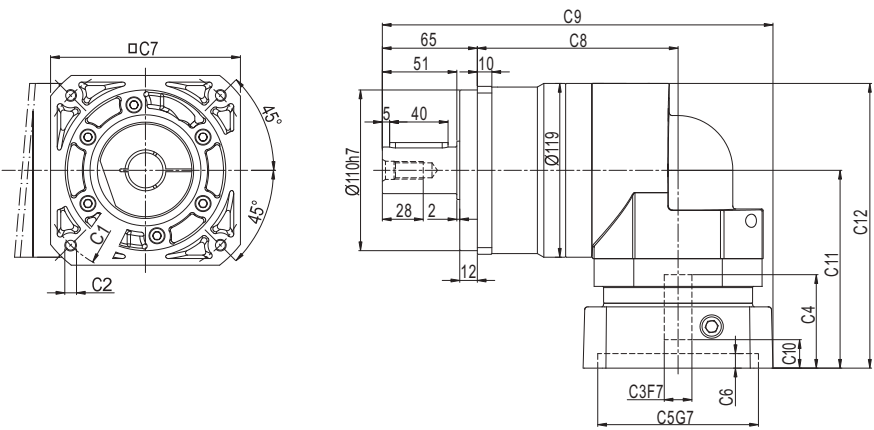
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-090A-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	160.5	249.5	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	160.5	249.5	6	96	143
FER-090AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	160.5	254.5	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	10	130	160.5	269.5	19	120	167

*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 dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

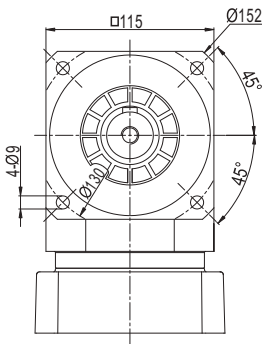
产品尺寸 / product dimension

FBR-115-L1

输入端 / INPUT

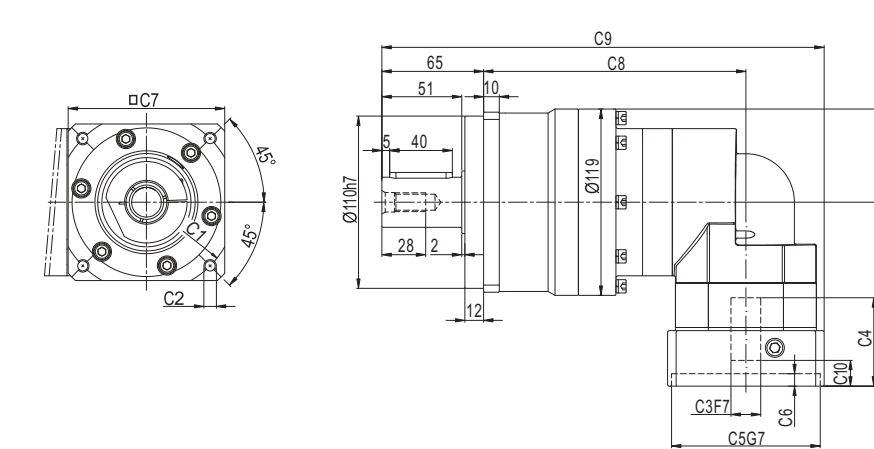


输出端 / OUTPUT

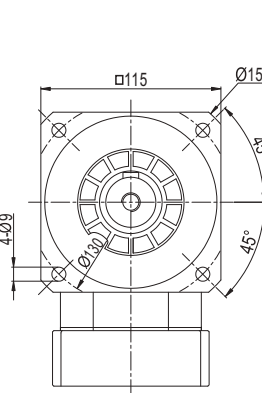


FBR-115-L2

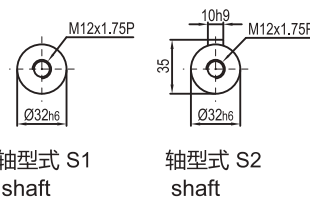
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



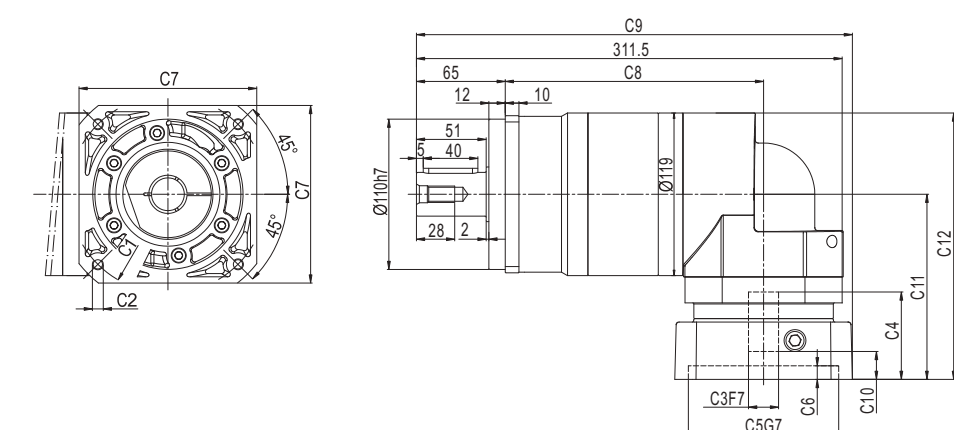
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-115-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	137.5	267.5	19.5	135.5	195
FBR-115M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	137.5	292.5	28	152.5	212
FBR-115-L2	Ø90	4-M5x12, 4-M6x14	Ø19	45	Ø70	6.5	80	167.5	277.5	7	96	155.5
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

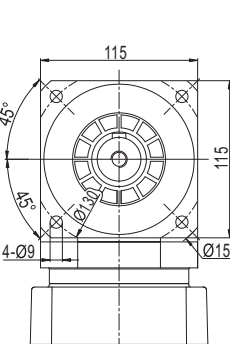
产品尺寸 / product dimension

FBR-115A-L2

输入端 / INPUT

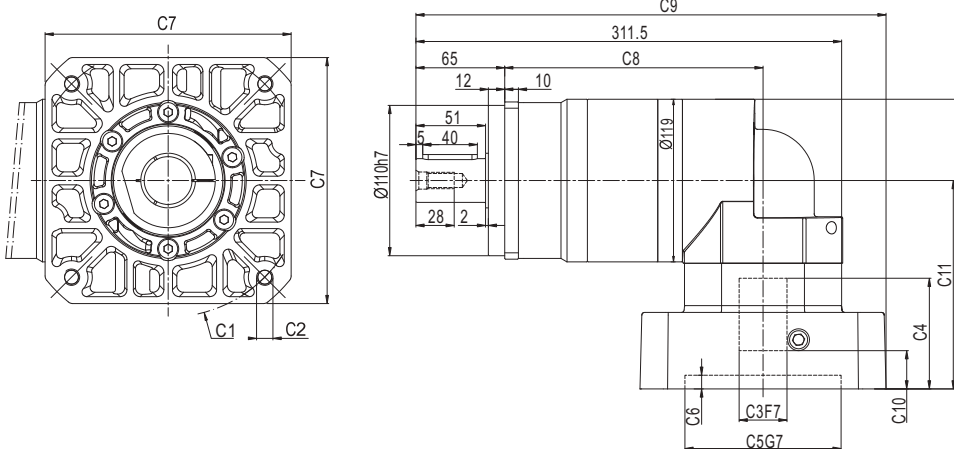


输出端 / OUTPUT

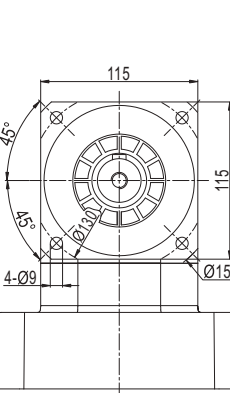


FBR-115A-L2

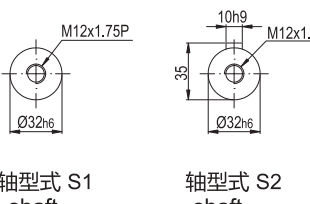
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



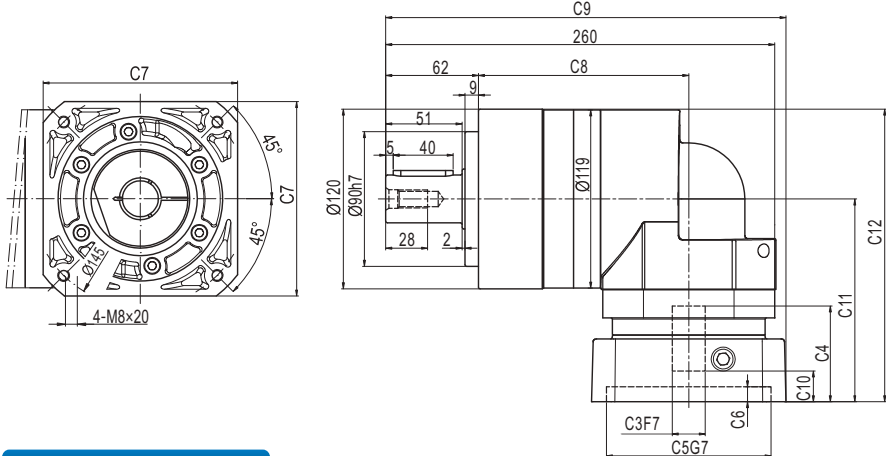
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-115A-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	189	319	19.5	135.5	195.5
FBR-115AM1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	189	344	28	152.5	212.5

*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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

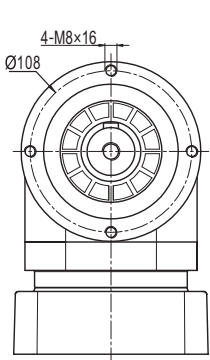
产品尺寸 / product dimension

FER-120-L1

输入端 / INPUT

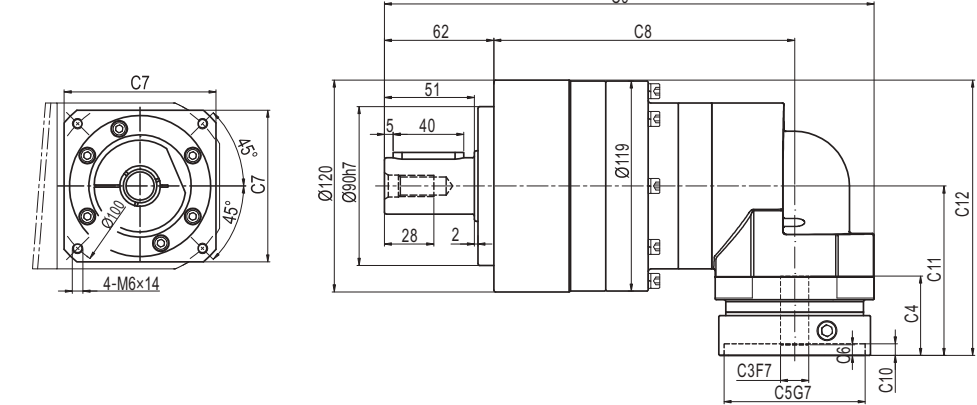


输出端 / OUTPUT

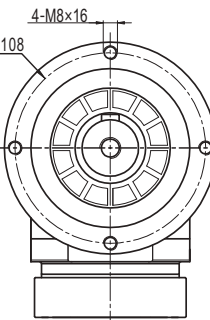


FER-120-L2

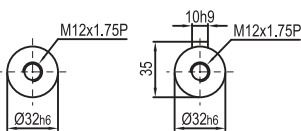
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

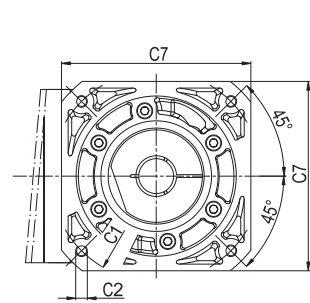
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-120-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	140.5	267.5	19.5	135.5	195.5
FER-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	140.5	292.5	28	152.5	212.5
FER-120-L2	Ø90	4-M5x12, 4-M6x14	Ø19	45	Ø70	6.5	80	170.5	277.5	7	96	156
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

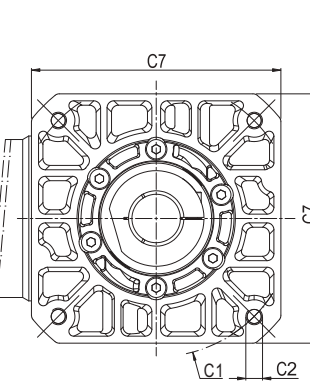
FER-120A-L2

输入端 / INPUT

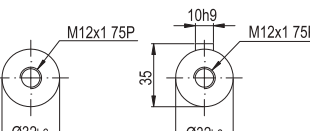


FER-120A-L2

输入端 / INPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

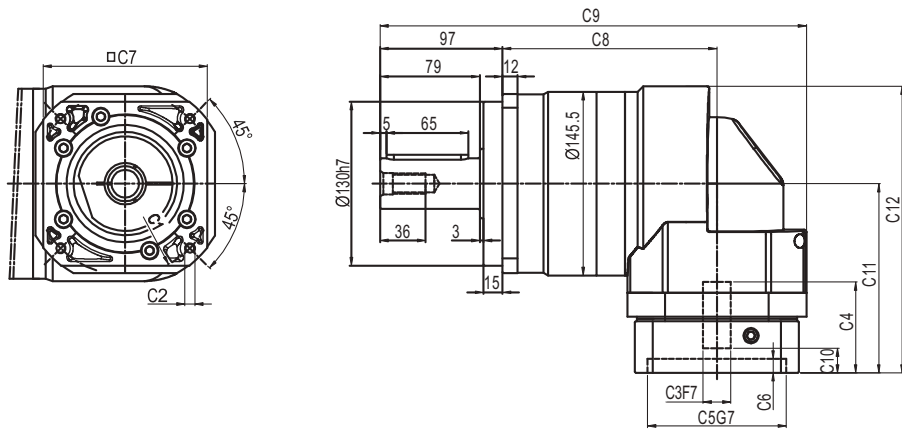
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-120A-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	192	319	19.5	135.5	195.5
FER-120AM1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	192	344	28	152.5	212.5

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

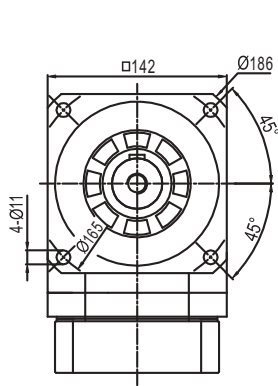
产品尺寸 / product dimension

FBR-142-L1

输入端 / INPUT

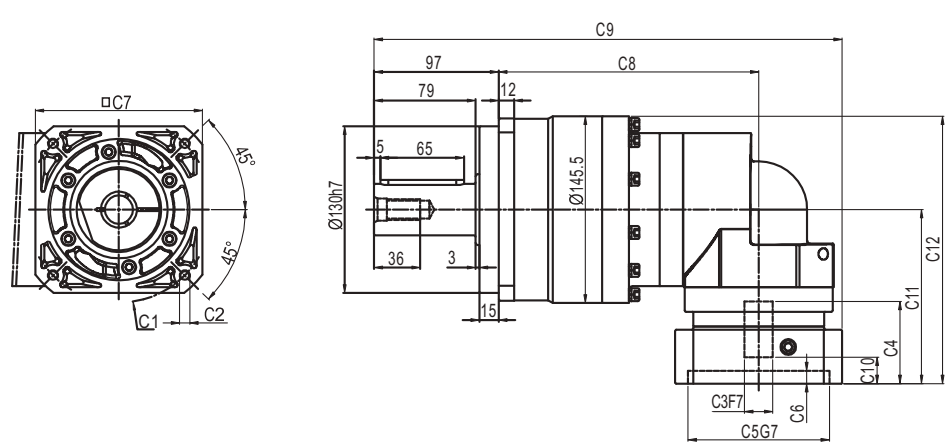


输出端 / OUTPUT

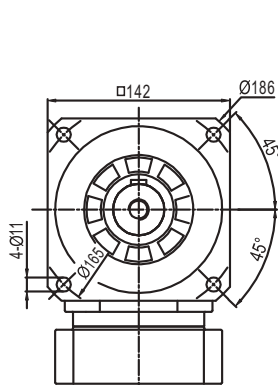


FBR-142-L2

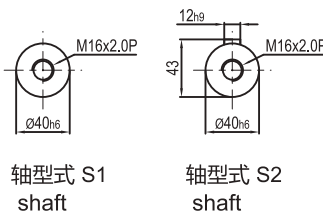
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



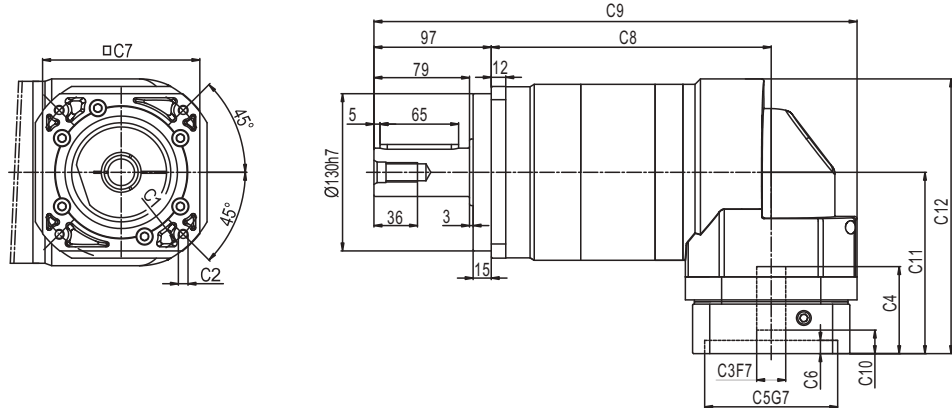
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-142-L1	$\varnothing 145$	4-M8x20	$\varnothing 22, \varnothing 24$	72	$\varnothing 110$	11	130	170	338	19.5	150	227.25
	$\varnothing 200$	4-M12x28	$\varnothing 35$	82	$\varnothing 114.3$	8	180	170	357	25	160	237.25
FBR-142-L2	$\varnothing 145$	4-M8x20	$\varnothing 19, \varnothing 22, \varnothing 24$	64	$\varnothing 110$	10	130	202.5	364.5	19.5	135.5	210.75
FBR-142M1-L2	$\varnothing 200$	4-M12x28	$\varnothing 35$	81	$\varnothing 114.3$	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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

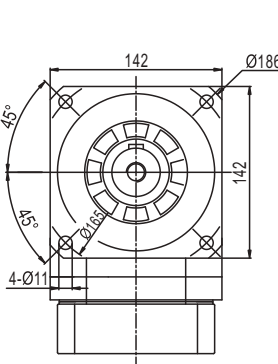
产品尺寸 / product dimension

FBR-142A-L2

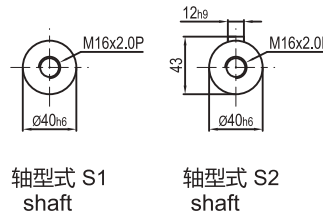
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter

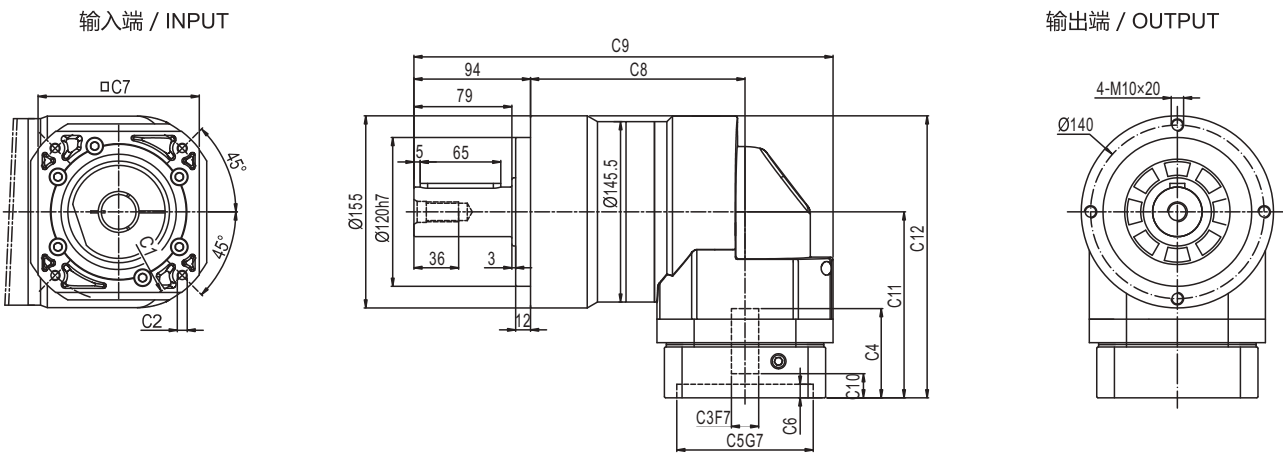


尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-142A-L2	$\varnothing 145$	4-M8x20	$\varnothing 22, \varnothing 24$	72	$\varnothing 110$	11	130	231.5	399.5	19.5	150	227.25
	$\varnothing 200$	4-M12x28	$\varnothing 35$	82	$\varnothing 114.3$	8	180	231.5	418.5	25	160	237.25

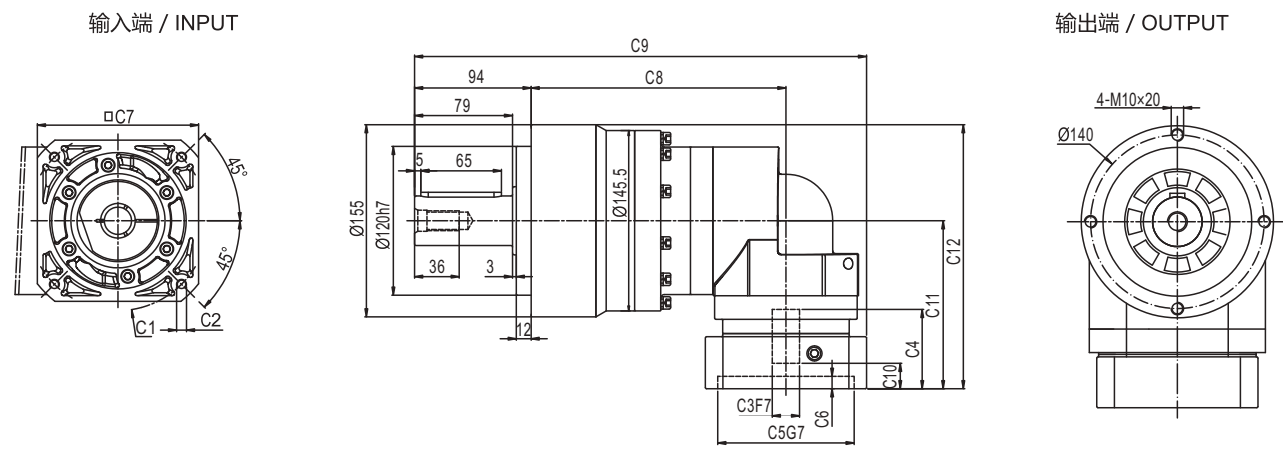
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.

产品尺寸 / product dimension

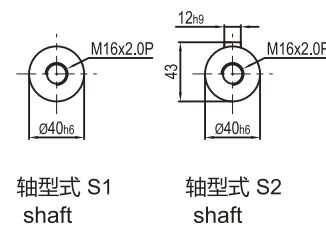
FER-155-L1



FER-155-L2



输出轴径/Output Diameter

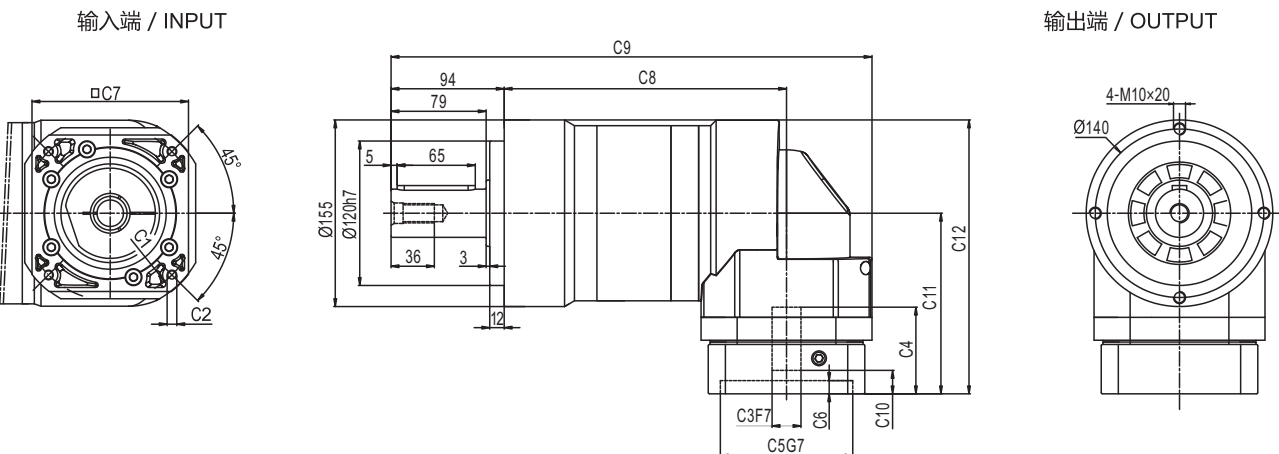


尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-155-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	173	338	19.5	150	227.5
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	173	357	25	160	237.5
FER-155-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	205.5	364.5	19.5	135.5	213
FER-155M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	205.5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

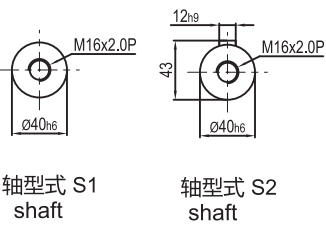
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

FER-155A-L2



输出轴径/Output Diameter

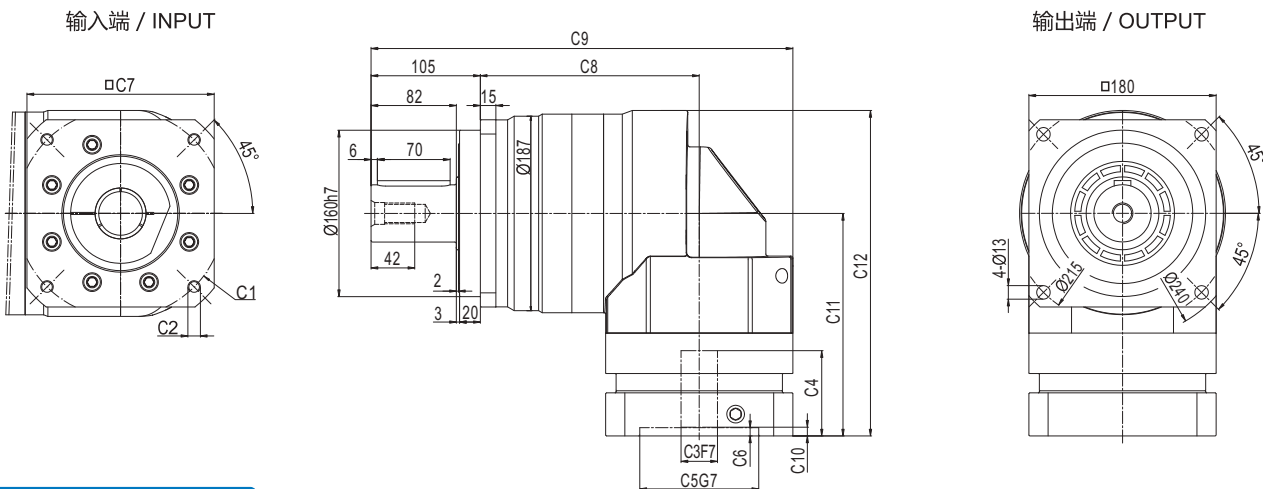


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-155A-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	234.5	399.5	19.5	150	227.5
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	234.5	418.5	25	160	237.5

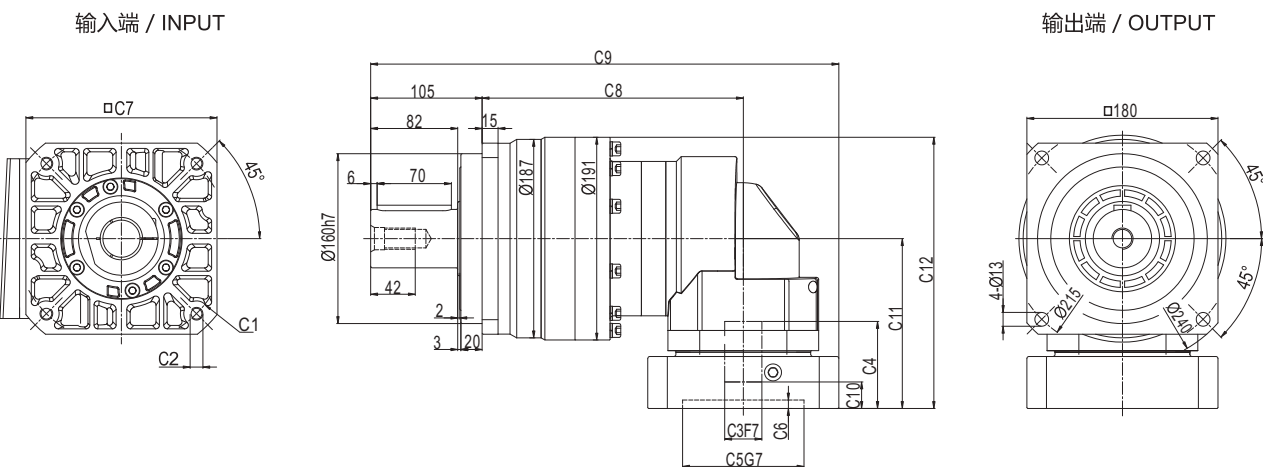
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.

产品尺寸 / product dimension

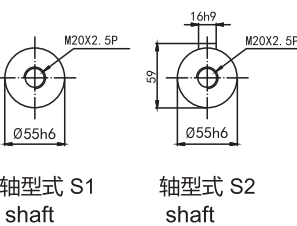
FBR-180-L1



FBR-180-L2



输出轴径/Output Diameter

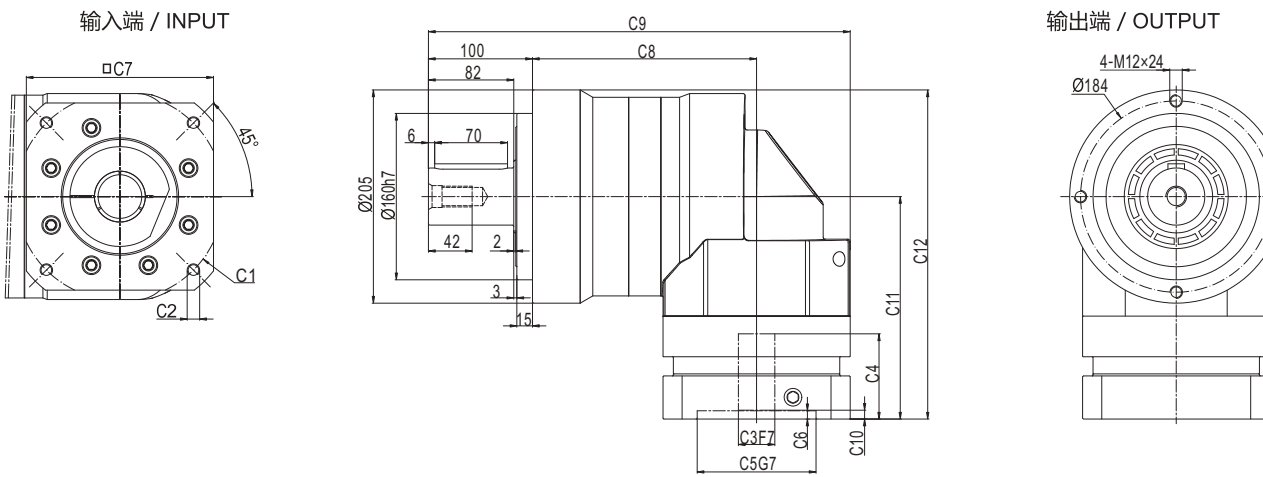


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-180-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	210.5	405.5	8.5	214	313
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	210.5	405.5	45.5	249.5	348.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	210.5	411.5	13.5	219	318
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	213.5	318.5	45.5	249.5	348.5
FBR-180-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

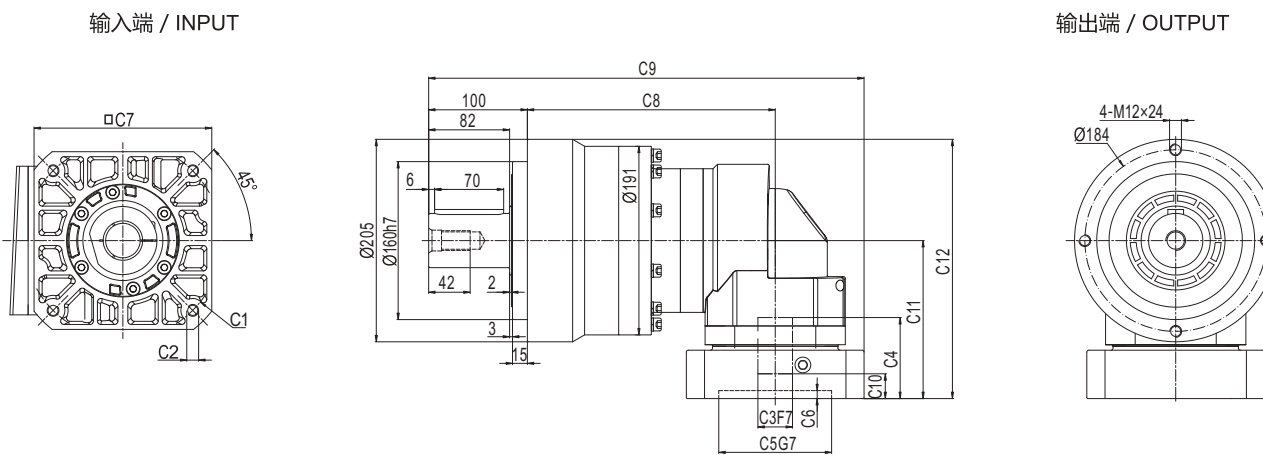
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7are motor(metric standard) specific dimensions, which could be customized.

产品尺寸 / product dimension

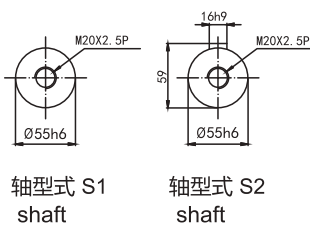
FER-205-L1



FER-205-L2



输出轴径/Output Diameter



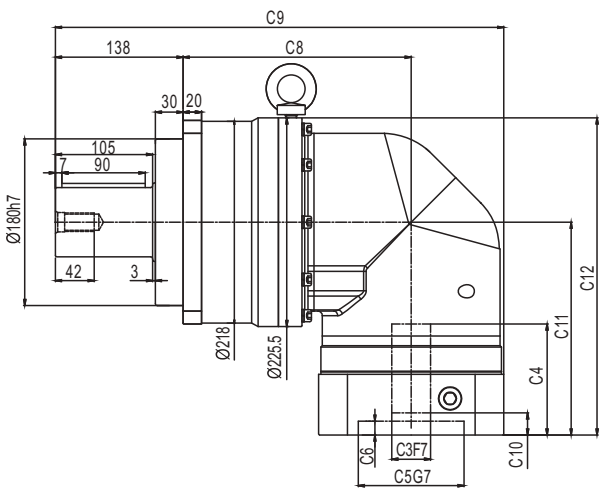
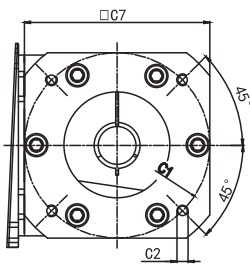
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-205-L1	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	215.5	405.5	8.5	214	318
	Ø200	4-M12x28	Ø42	117.5	Ø114.3	8	180	215.5	405.5	45.5	249.5	353.5
	Ø215	4-M12x28	Ø38	87	Ø180	8	192	215.5	411.5	13.5	219	323
	Ø235	4-M12x28	Ø42	117.5	Ø200	10	220	218.5	318.5	45.5	249.5	353.5
FER-205-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 customized.

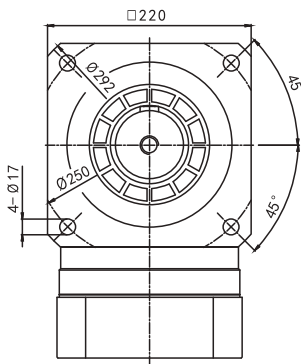
产品尺寸 / product dimension

FBR-220-L1

输入端 / INPUT

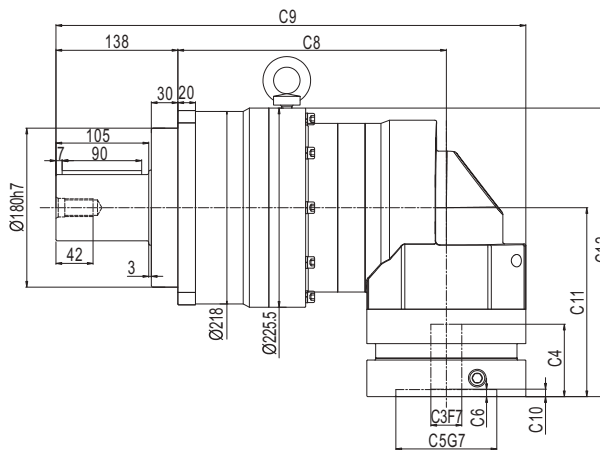
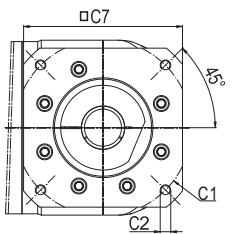


输出端 / OUTPUT

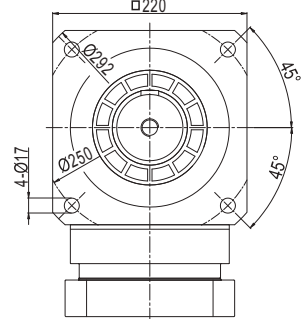


FBR-220-L2

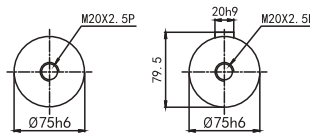
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

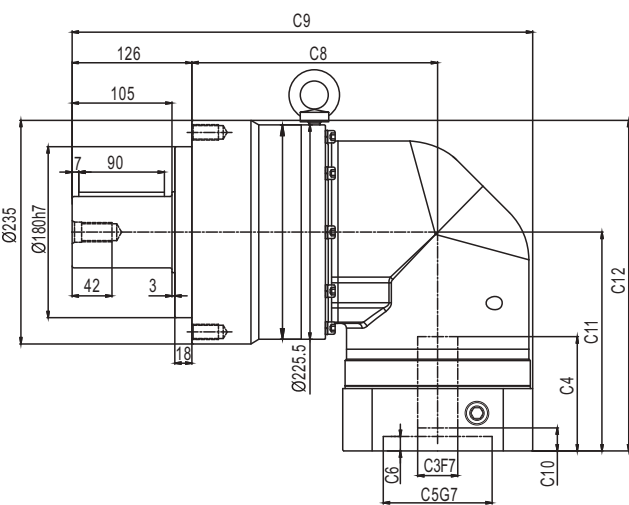
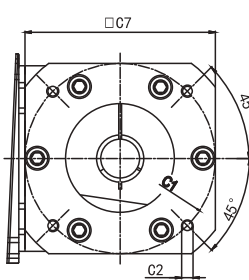
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FBR-220-L1	Ø200	4-M12x28	Ø35, Ø42	120	Ø114.3	15	200	246.5	484.5	22.5	230	342.75
	Ø215	4-M12x30	Ø38	110	Ø180	8	200	246.5	484.5	12.5	220	332.75
	Ø235	4-M12x30	Ø42, Ø55	120	Ø200	10	220	246.5	494.5	24	230	342.75
FBR-220-L2	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	304	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 dimenisions, which could be customized.

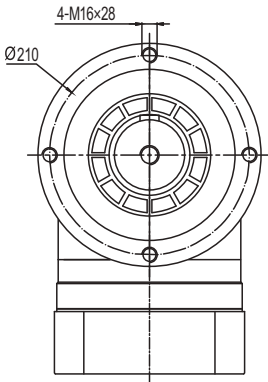
产品尺寸 / product dimension

FER-235-L1

输入端 / INPUT

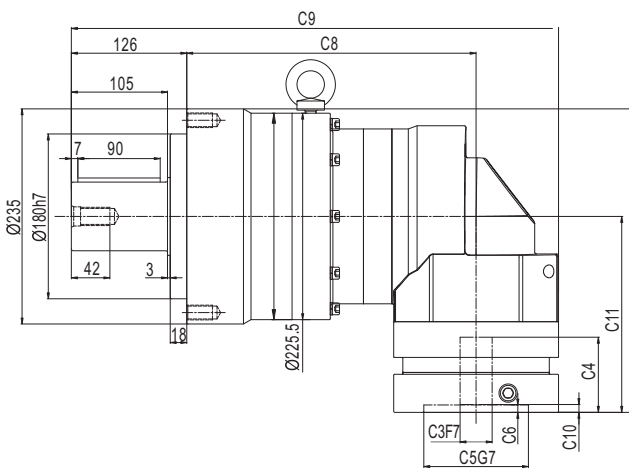
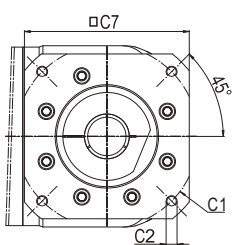


输出端 / OUTPUT

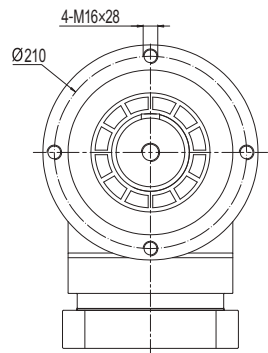


FER-235-L2

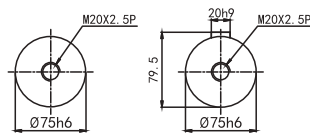
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



轴型式 S1
shaft

轴型式 S2
shaft

尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FER-235-L1	Ø200	4-M12x28	Ø35, Ø42	120	Ø114.3	15	200	258.5	484.5	22.5	230	347.5
	Ø215	4-M12x30	Ø38	110	Ø180	8	200	258.5	484.5	12.5	220	337.5
	Ø235	4-M12x30	Ø42, Ø55	120	Ø200	10	220	258.5	494.5	24	230	347.5
FER-235-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 dimenisions, which could be customized.

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精密行星减速机

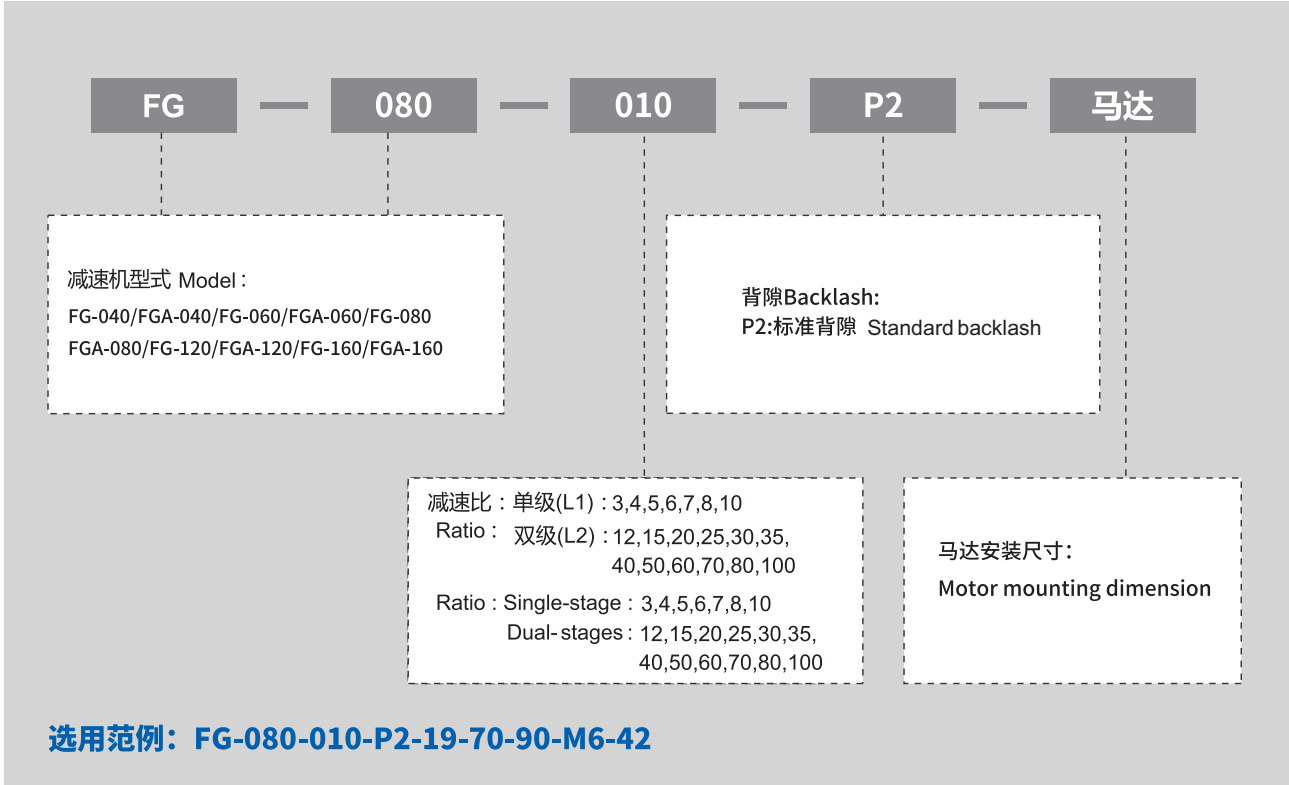
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SKGR三凯

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

FG/FGA系列

型号说明 / model description



技术参数 / technical specification

规格 Model	级数 Stage	减速比 ¹ Ratio	FG040 FGA040	FG060 FGA060	FG080 FGA08	FG080A FGA080A	FG120 FGA120	FG120A FGA120A	FG160 FGA160	FG160A FGA160A	
额定输出力矩T _{2N} Rated output torque	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	130	208	208	342	342	
		15	20	55	130	130	208	208	342	342	
		20	19	50	140	140	290	290	542	542	
		25	22	60	160	160	330	330	650	650	
		30	22	55	130	130	208	208	342	342	
		35	22	60	160	160	330	330	650	650	
		40	22	50	140	140	290	290	542	542	
		50	22	60	160	160	330	330	650	650	
		60	20	55	150	150	310	310	600	600	
		70	19	50	140	140	300	300	550	550	
		80	17	45	120	120	260	260	500	500	
		100	14	40	100	100	230	230	450	450	
最大输出力矩T _{2S} /Max.output torque	Nm	1.2	3倍额定输出力矩 3 times the rated output torque								
额定输入转速n ₁ /Rated input speed	rpm	1.2	3~100	5,000	5,000	4,000	4,000	4,000	4,000	3,000	3,000
最大输入转速n _{1S} /Max.input speed	rpm	1.2	3~100	10,000	10,000	8,000	8,000	8,000	8,000	6,000	6,000
标准背隙 P2/Precision backlash	arcmin	1	3~10	≤8	≤8	≤8	≤8	≤8	≤8	≤8	≤8
		2	12~100	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤10
扭转刚性/Torsional rigidity	Nm/arcmin	1.2	3~100	3	7	14	14	25	25	50	50
容许径向力F _{2rS} ² /Allowable radial force	N	1.2	3~100	780	1,530	3,250	3,250	6,700	6,700	9,400	9,400
容许轴向力F _{2a1S} ² /Allowable radial force	N	1.2	3~100	350	630	1,300	1,300	3,000	3,000	4,000	4,000
容许轴向力F _{2a2S} ² /Allowable radial force	N	1.2	3~100	390	765	1,625	1,625	3,350	3,350	4,700	4,700
使用寿命/Life time	hr	1.2	3~100	20,000*							
效率 η /Efficiency	%	1	3~10	≥97%							
		2	12~100	≥94%							
重量/Weight	kg	1	3~10	0.5	1.3	3.7	—	7.8	—	14.5	—
		2	12~100	0.8	1.9	4.1	4.76	9	10.92	17.5	20.3
使用温度/Operating temperature	℃	1.2	3~100	-10℃~+90℃							
润滑/lubrication		1.2	3~100	合成润滑油脂 Synthetic lubricating grease							
防护等级/Ingress protection		1.2	3~100	IP65							
安装方向/Mount position		1.2	3~100	任意方向 Any direction							
噪音值(n=3000rpm)/Noise level	dB	1.2	3~100	≤56	≤58	≤60	≤60	≤63	≤63	≤65	≤65

减速机转动惯量 Gearbox moment of inertia

规 格 Model		级 数 Stage	减速比 ¹ Ratio	FG040 FGA040	FG060 FGA060	FG080 FGA08	FG080A FGA080A	FG120 FGA120	FG120A FGA120A	FG160 FGA160	FG160A FGA160A
转动惯量J ₁ Moment of inertia	kg·cm ²	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	—
		2	10	0.03	0.13	0.44	—	2.57	—	7.03	—
			12	0.03	0.03	0.03	0.47	0.47	2.71	2.71	7.42
			15	0.03	0.03	0.03	0.47	0.47	2.71	2.71	7.42
			20	0.03	0.03	0.03	0.47	0.47	2.71	2.71	7.42
			25	0.03	0.03	0.03	0.47	0.47	2.71	2.71	7.42
			30	0.03	0.03	0.03	0.47	0.47	2.71	2.71	7.42
			35	0.03	0.03	0.03	0.47	0.47	2.71	2.71	7.42
			40	0.03	0.03	0.03	0.47	0.47	2.71	2.71	7.42
			50	0.03	0.03	0.03	0.44	0.44	2.57	2.57	7.03
			60	0.03	0.03	0.03	0.44	0.44	2.57	2.57	7.03
			70	0.03	0.03	0.03	0.44	0.44	2.57	2.57	7.03
			80	0.03	0.03	0.03	0.44	0.44	2.57	2.57	7.03
			100	0.03	0.03	0.03	0.44	0.44	2.57	2.57	7.03

1.减速比Ratio(i=N_{in}/N_{out})

* 连续运转降低使用寿命二分之一。

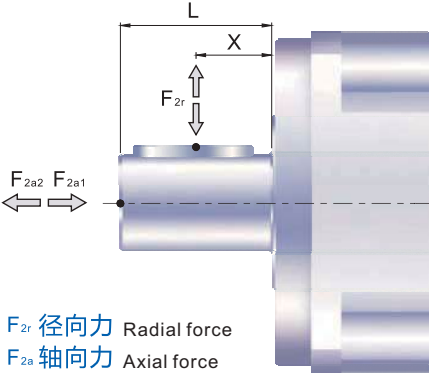
The lifetime will be shortened by half under continuous operation.

2.输出转速 100rpm 时，作用于输出轴中心位置。

When the output speed is 100rpm, it applies on the center of the output shaft.

减速机输出轴之容许径向力及轴向力

ALLOWABLE RADIAL AND AXIAL FORCES ON THE OUTPUT SHAFT OF THE GEAR REDUCER



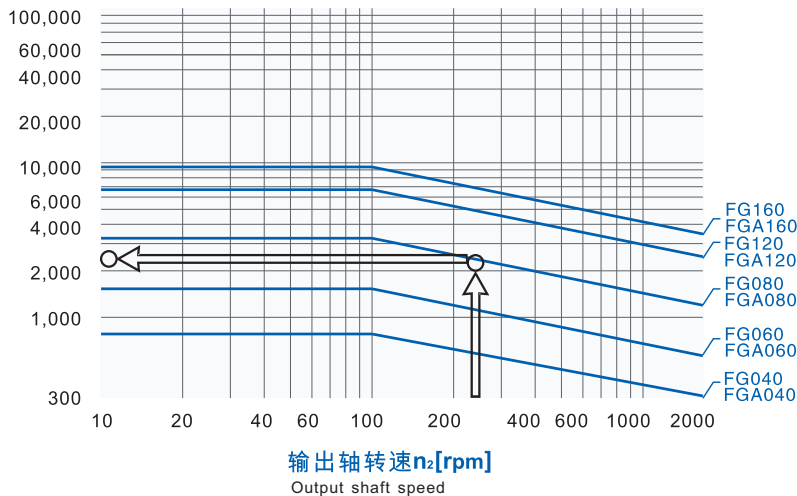
减速机输出轴所能承受之最大径向力及轴向力。端视内部支撑轴承之设计，减速机采用大尺寸的轴承及较大跨距的设计，其能承受更大的径向及轴向负荷。

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

F_{2r} 径向力 Radial force
F_{2a} 轴向力 Axial force

容许径向力F_{2rB}【N】施力于轴中心位置

Permissible radial force F_{2rB} 【N】 apply force to the center of the shaft



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

When the radial force F_{2r} is applied to the center of the shaft, i.e. X=1/2xL, the allowable radial force F_{2rB} that can be withstood by different specifications of reducers with a service life of 20,000hr* under different output speeds is as follows:

F_{2a1B}=0.2x F_{2rB}

F_{2a2B}=0.1x F_{2rB}

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，查出位置负荷系数K_b，在代入下列公式求出容许

When the radial force F_{2r} is not in the center of the shaft, the closer to the gearbox, that is, X<1/2xL, the allowable radial force that can be borne becomes larger, and the farther away from the reducer, i.e., X>1/2xL, the allowable force that can be borne becomes smaller.

径向力 : Radial force

F_{2rB}=K_bx F_{2rB}

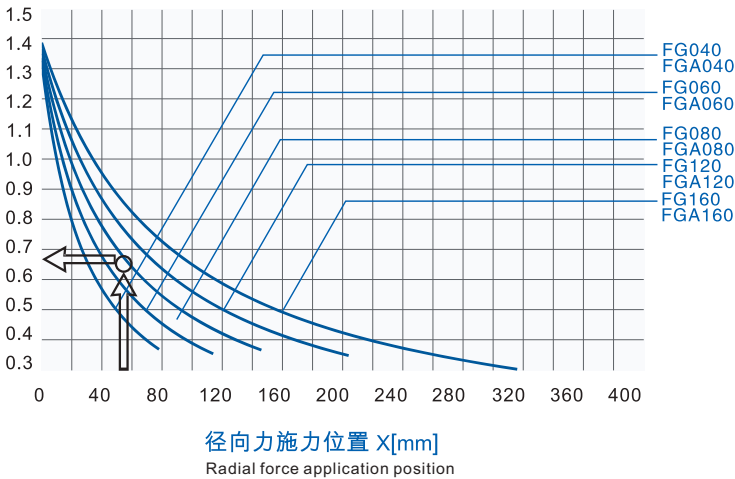
轴向力: Axial force

F_{2a1B}=0.2x F_{2rB}

F_{2a2B}=0.1x F_{2rB}

位置负荷系数K_b

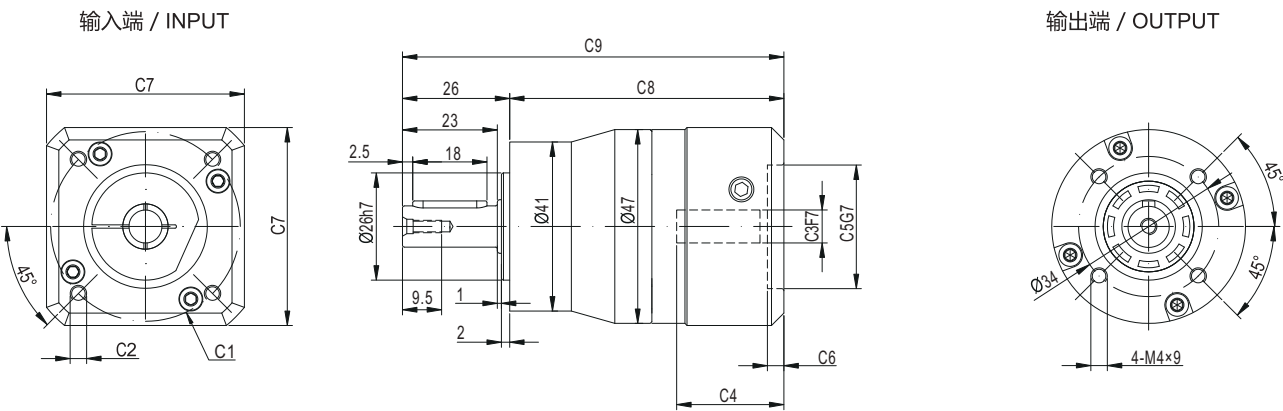
Positional load coefficient



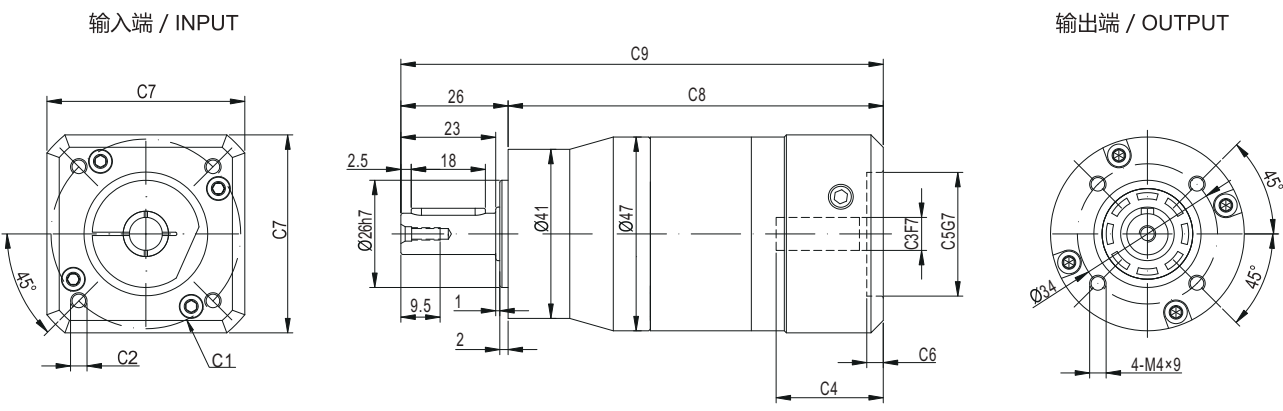
* 连续运转降低使用寿命二分之一。 The lifetime will be shortened by half under continuous operation.

产品尺寸 / product dimension

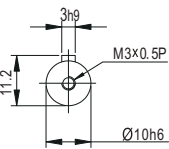
FG-040-L1



FG-040-L2



输出轴径/Output Diameter

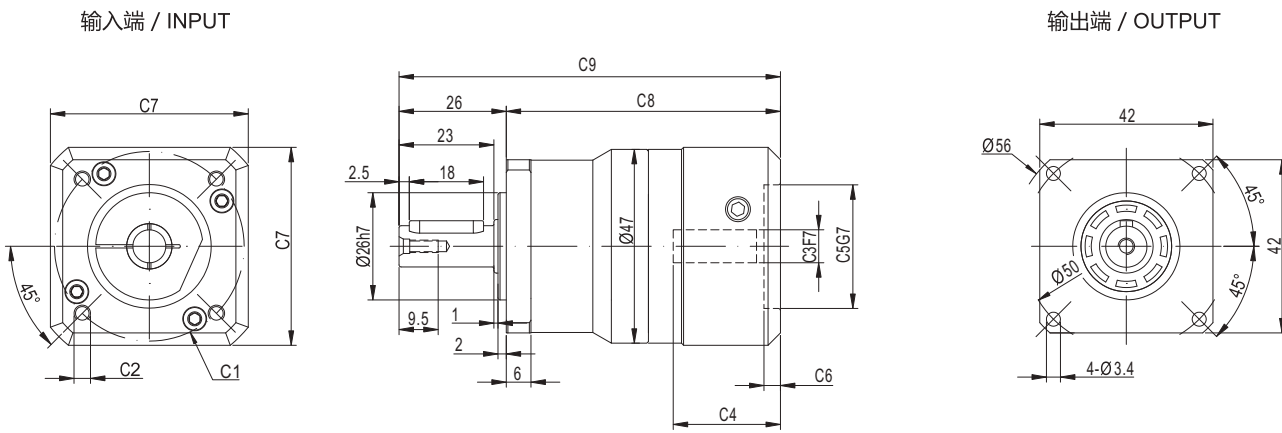


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FG-040-L1	Ø46	4-M4x10	Ø8	26	Ø30	4	42	66.5	92.5
	Ø45	4-M3x8							
FG-040-L2	Ø46	4-M4x10	Ø8	26	Ø30	4	42	91	117
	Ø45	4-M3x8							

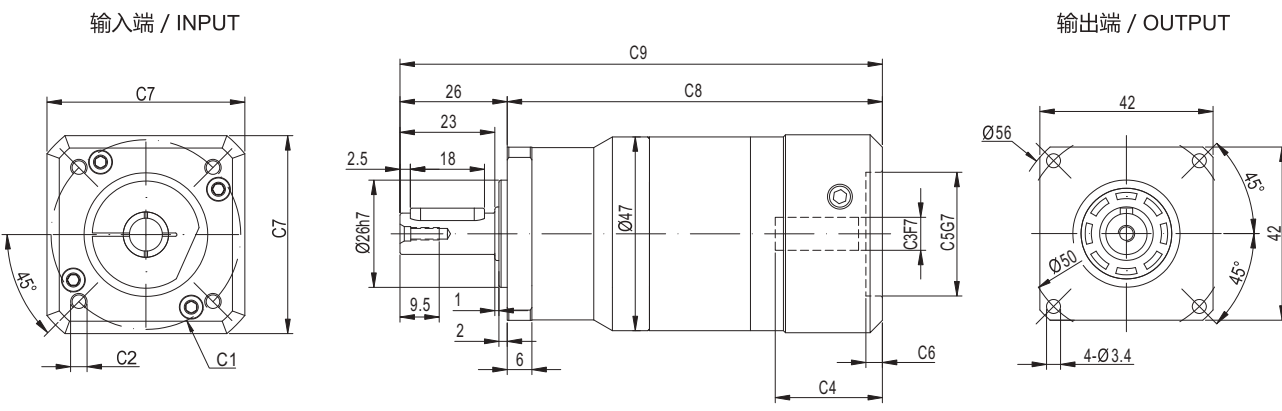
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7are motor(metric standard) specific dimenisions, which could be customized.

产品尺寸 / product dimension

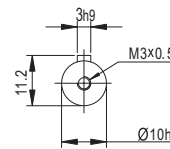
FGA-040-L1



FGA-040-L2



输出轴径/Output Diameter

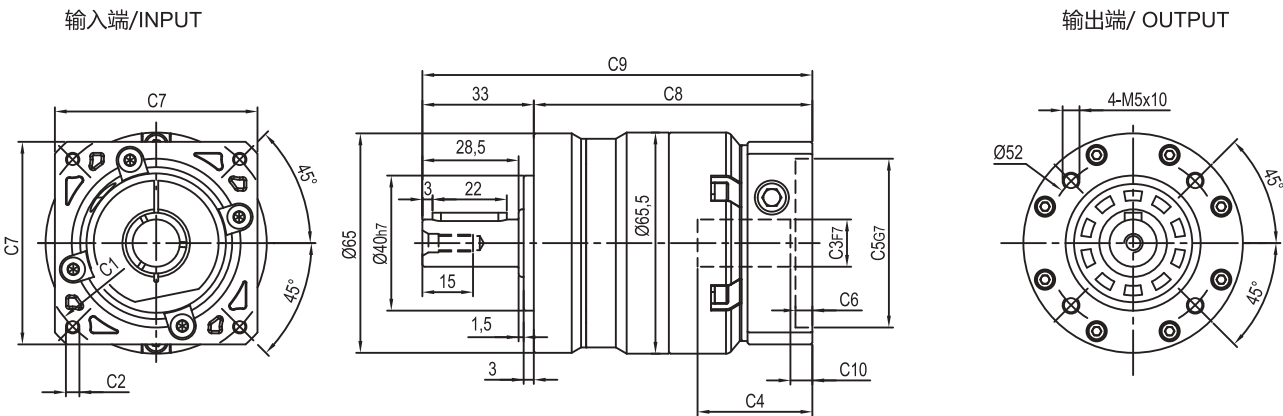


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9
FGA-040-L1	Ø46	4-M4x10	Ø8	26	Ø30	4	42	66.5	92.5
	Ø45	4-M3x8							
FGA-040-L2	Ø46	4-M4x10	Ø8	26	Ø30	4	42	91	117
	Ø45	4-M3x8							

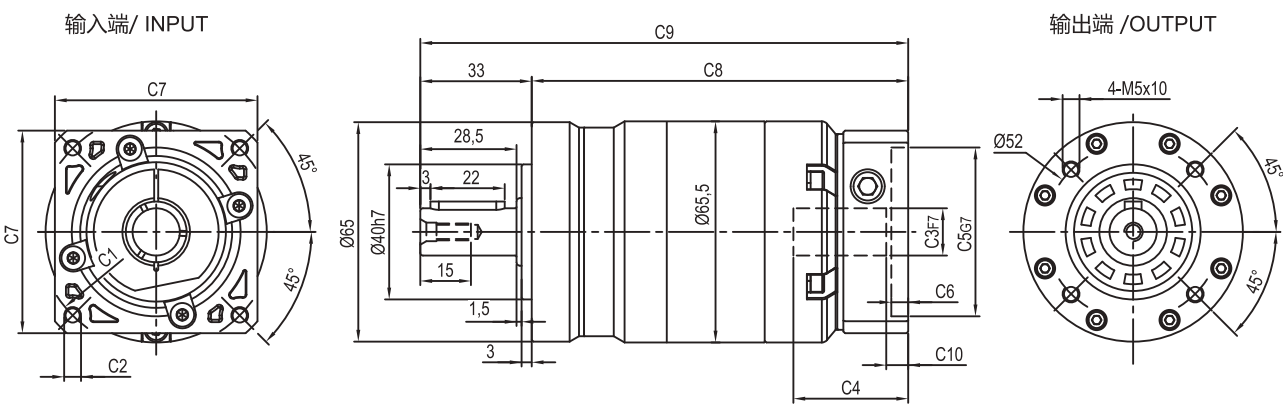
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7are motor(metric standard) specific dimenisions, which could be customized.

产品尺寸 / product dimension

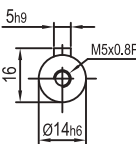
FG-060-L1



FG-060-L2



输出轴径/Output Diameter

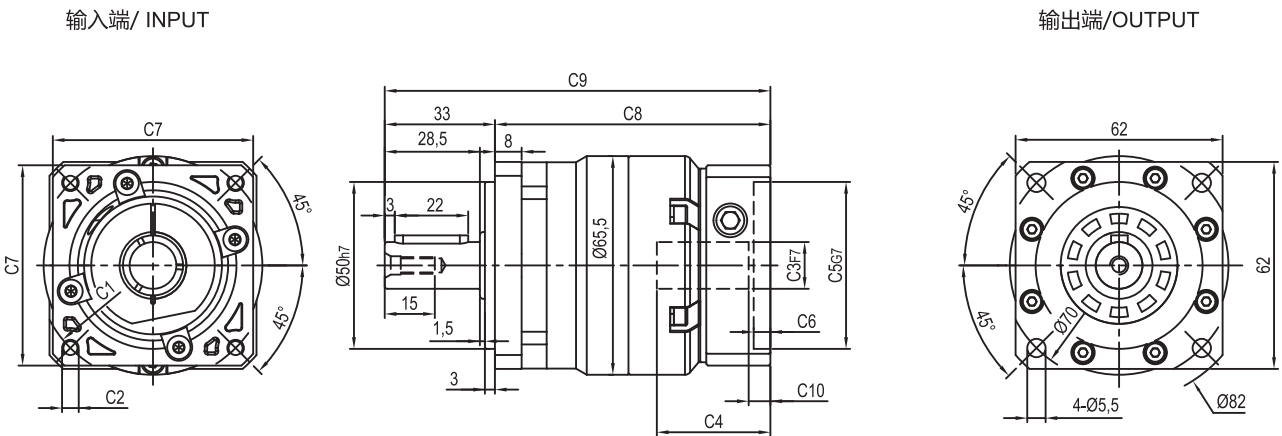


尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FG-060-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	82.5	115.5	5.5
FG-060-L2								111.5	144.5	5.5
FG-060-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	82.5	115.5	5.5
FG-060-L2								111.5	144.5	5.5
FG-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	89	122	12
FG-060M1-L2								118	151	12

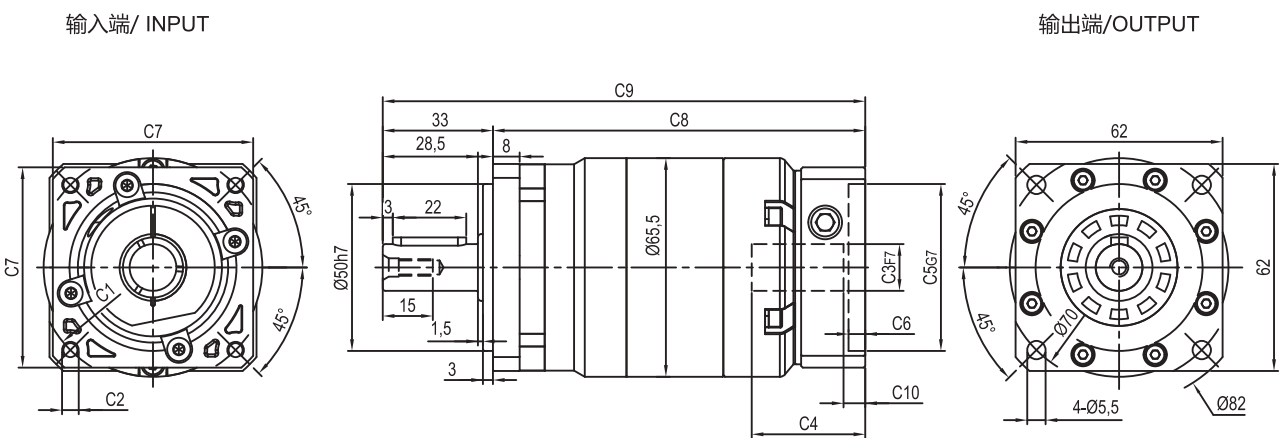
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

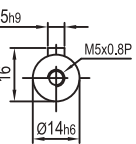
FGA-060-L1



FGA-060-L2



输出轴径/Output Diameter

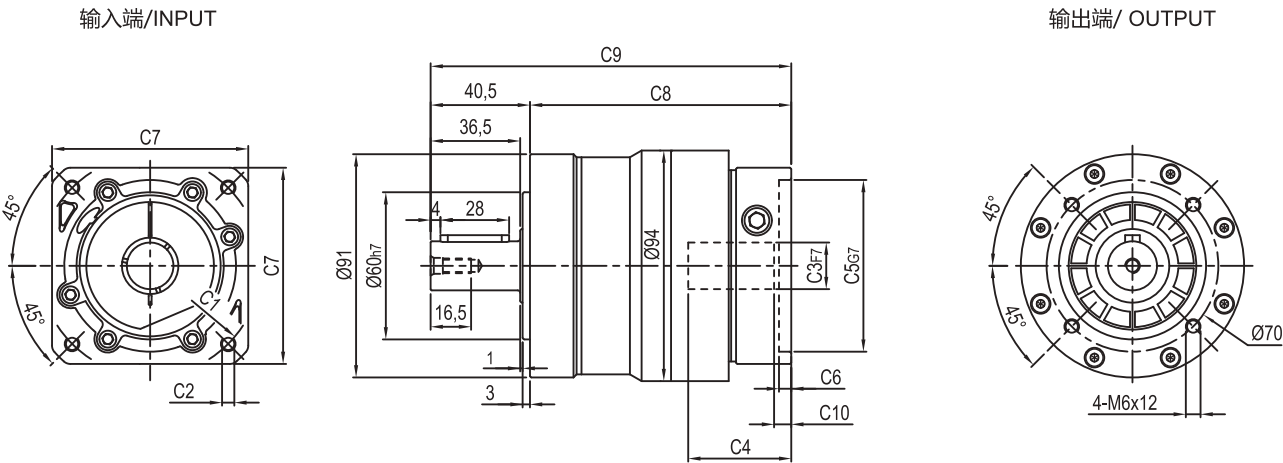


尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FGA-060-L1	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	82.5	115.5	5.5
FGA-060-L2								111.5	144.5	5.5
FGA-060-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	82.5	115.5	5.5
FGA-060-L2								111.5	144.5	5.5
FGA-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	89	122	12
FGA-060M1-L2								118	151	12

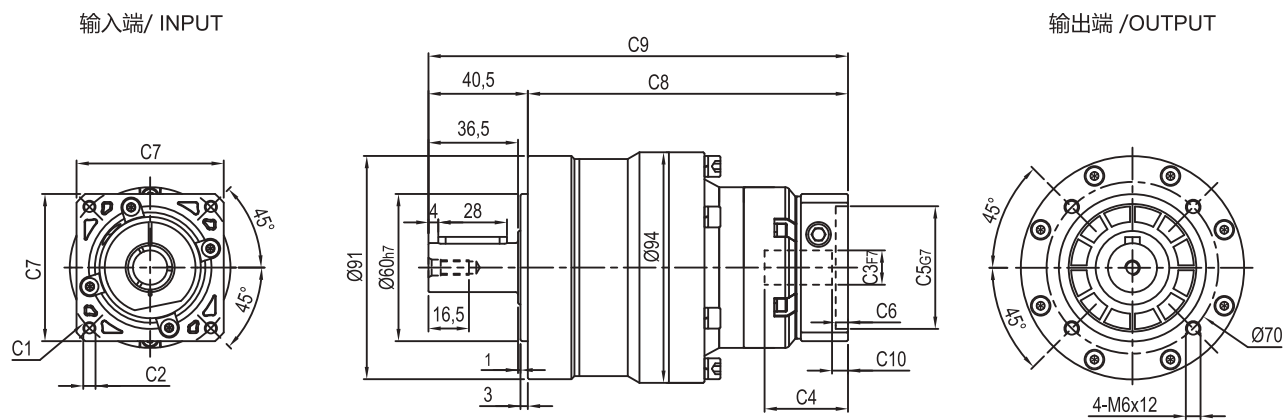
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

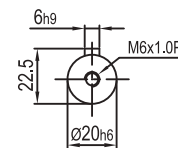
FG-080-L1



FG-080-L2



输出轴径/Output Diameter

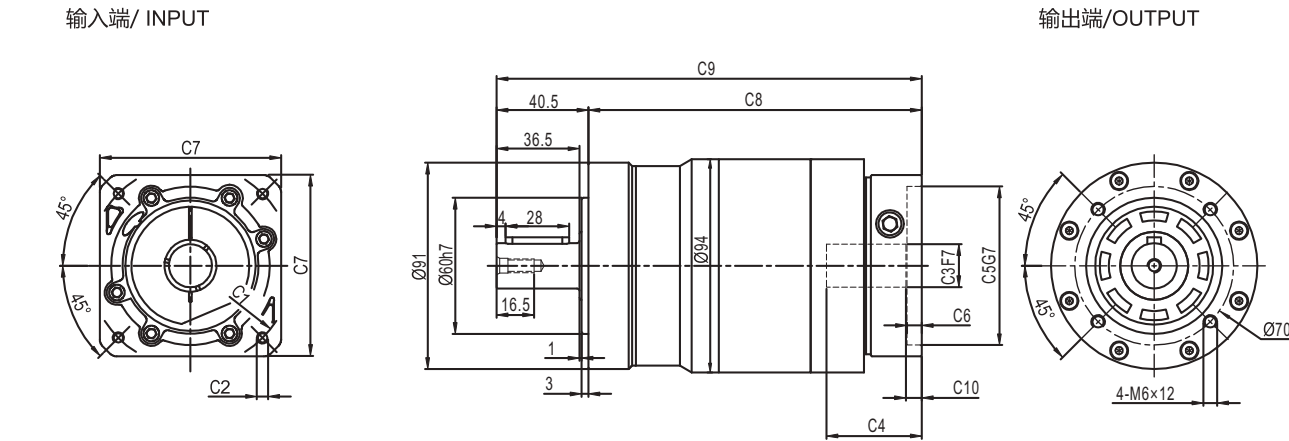


尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FG-080-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	106.5	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	106.5	147	6
FG-080M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	122	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	124.5	165	19
FG-080-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	130.5	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

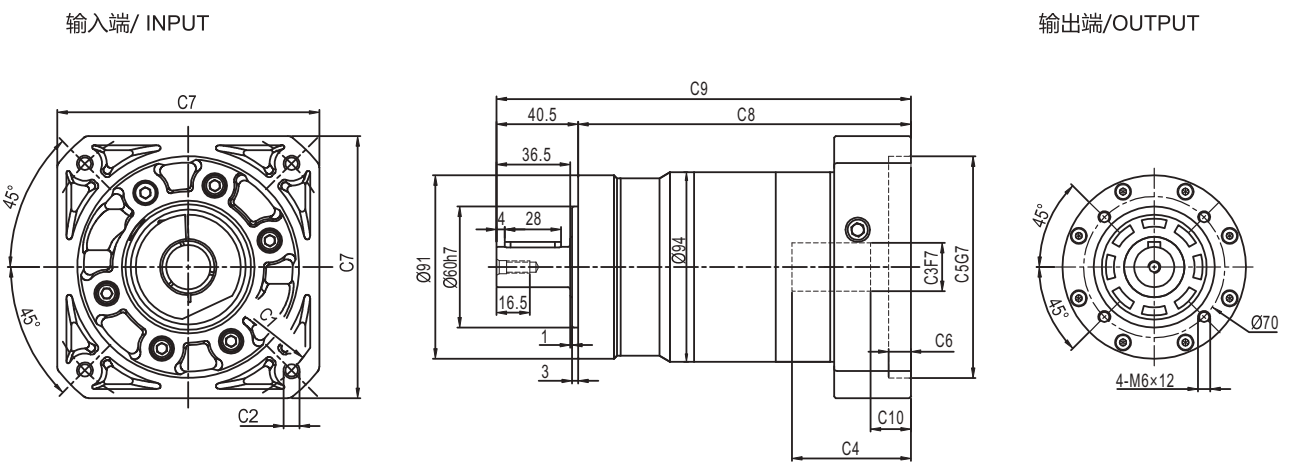
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

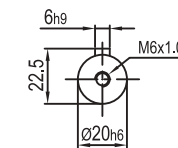
FG-080A-L2



FG-080A-L2



输出轴径/Output Diameter

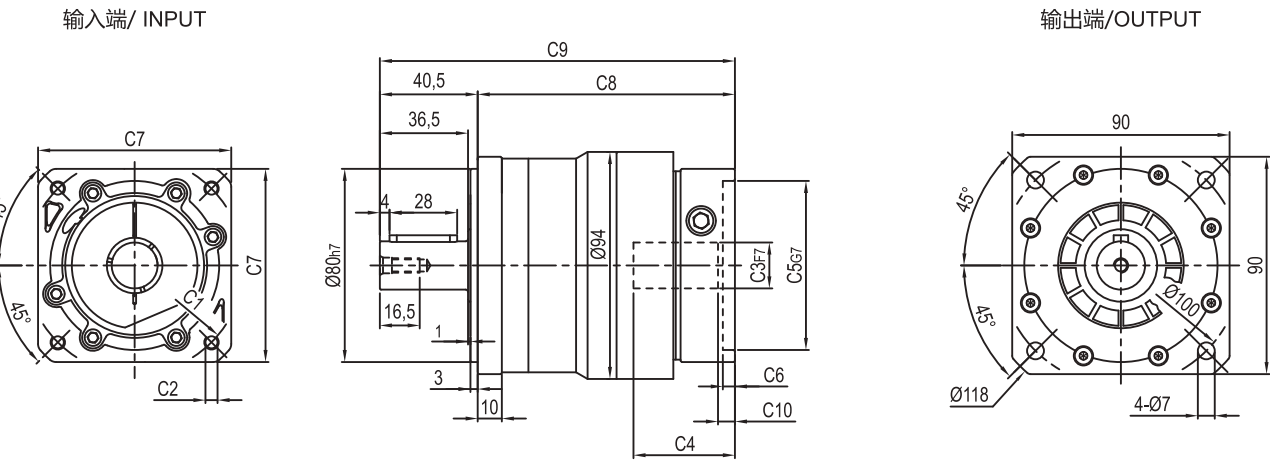


尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FG-080A-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	147	187.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	147	187.5	6
FG-080AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	162.5	203	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	10	130	165	205.5	19

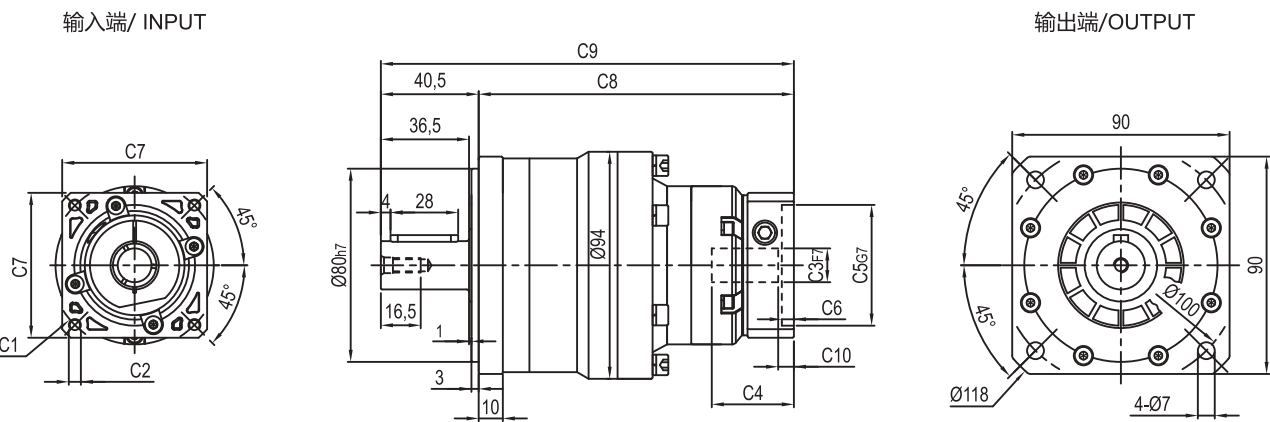
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

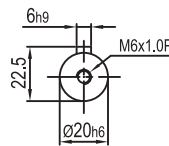
FGA-080-L1



FGA-080-L2



输出轴径/Output Diameter

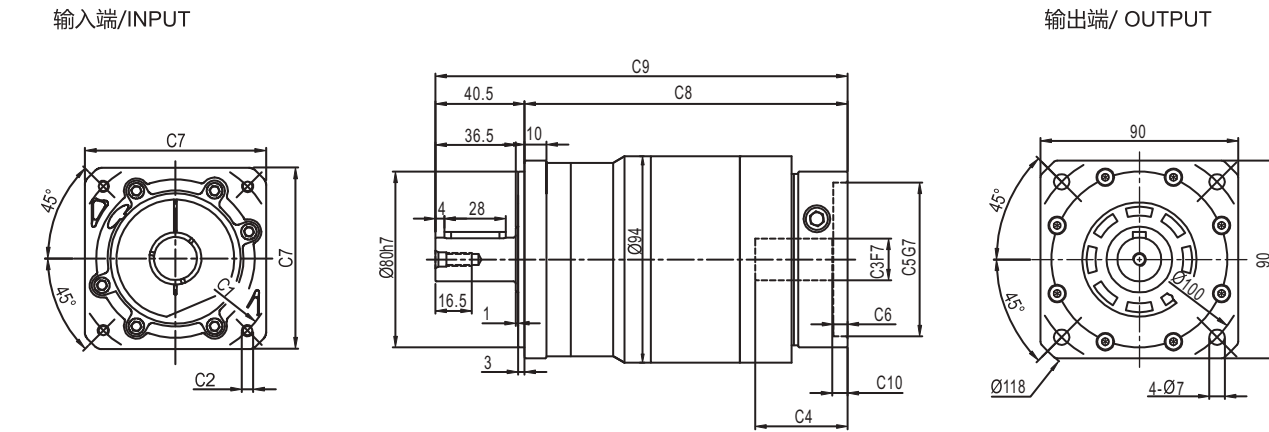


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FGA-080-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	106.5	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	106.5	147	6
FGA-080M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	122	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	124.5	165	19
FGA-080-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	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

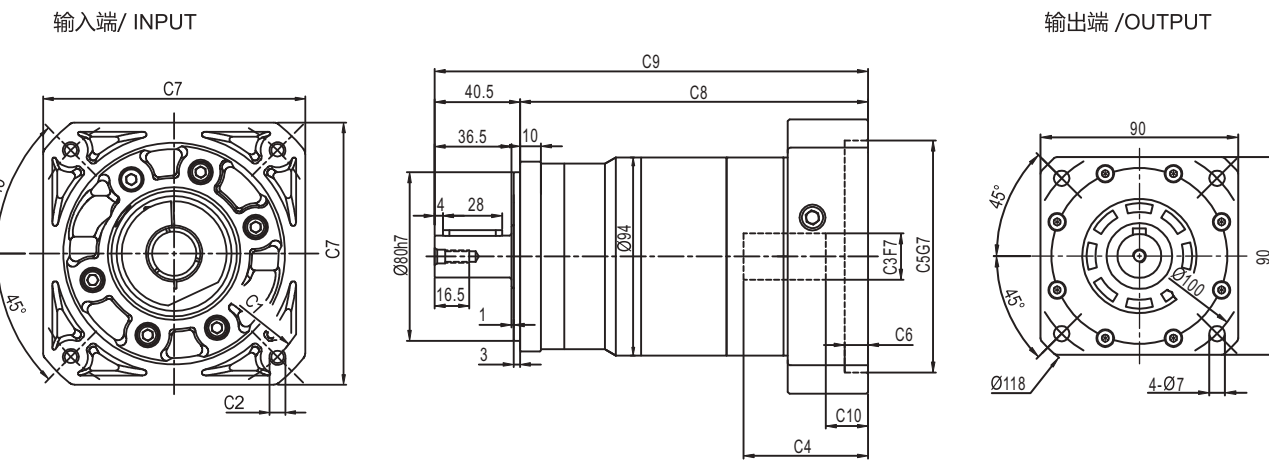
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

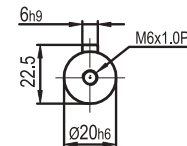
FGA-080A-L2



FGA-080A-L2



输出轴径/Output Diameter



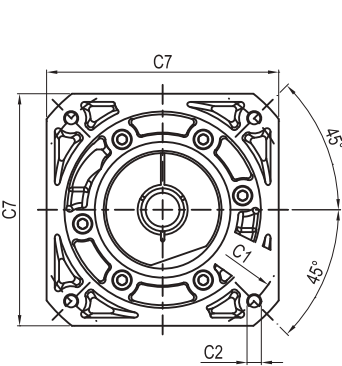
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FGA-080A-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	147	187.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	147	187.5	6
FGA-080AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	162.5	203	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	10	130	165	205.5	19

*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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

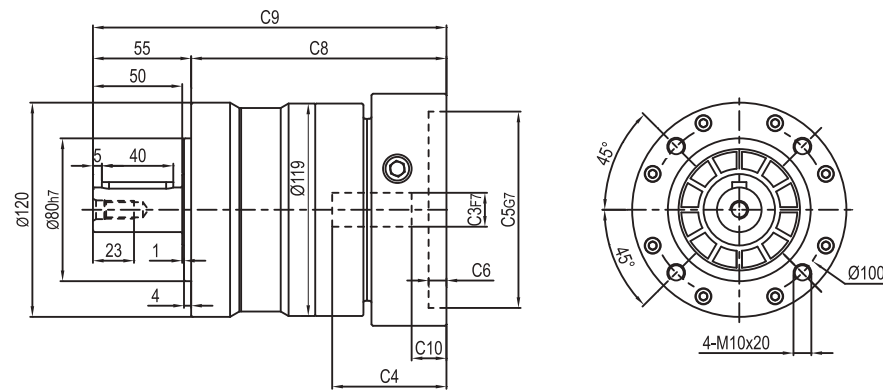
产品尺寸 / product dimension

FG-120-L1

输入端/INPUT

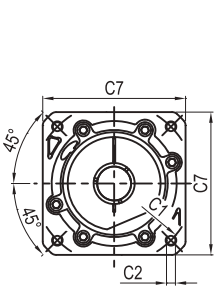


输出端/ OUTPUT

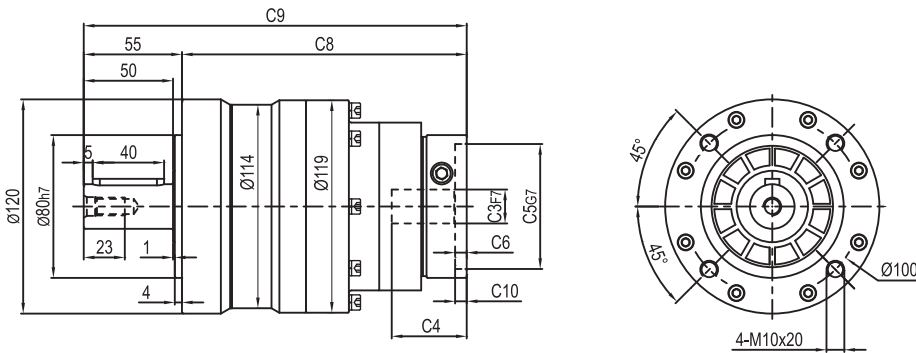


FG-120-L2

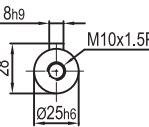
输入端/ INPUT



输出端 /OUTPUT



输出轴径/Output Diameter



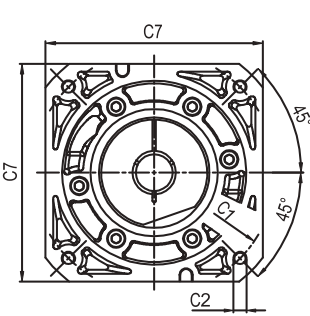
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FG-120-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	143	198	19.5
FG-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	160.5	215.5	28
FG-120-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	159.5	214.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	159.5	214.5	6
FG-120M1-L2	Ø115	4-M8x20	Ø19,Ø22	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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

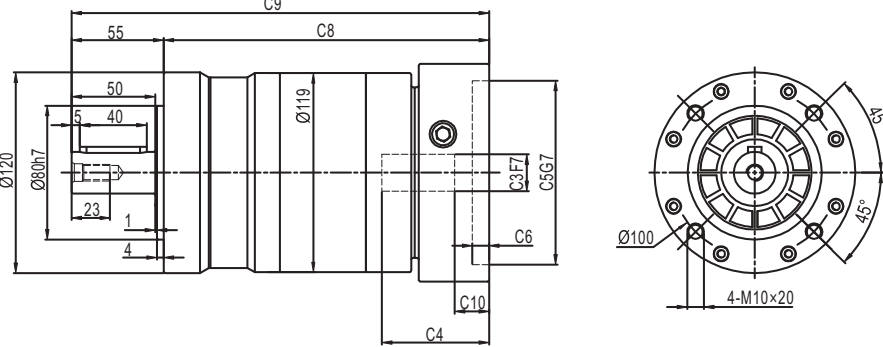
产品尺寸 / product dimension

FG-120A-L2

输入端/INPUT

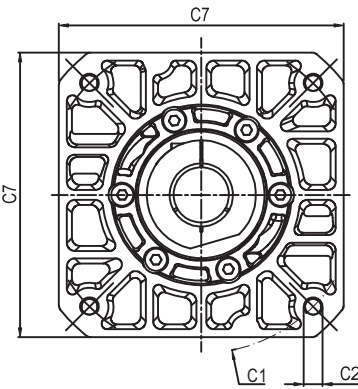


输出端/ OUTPUT

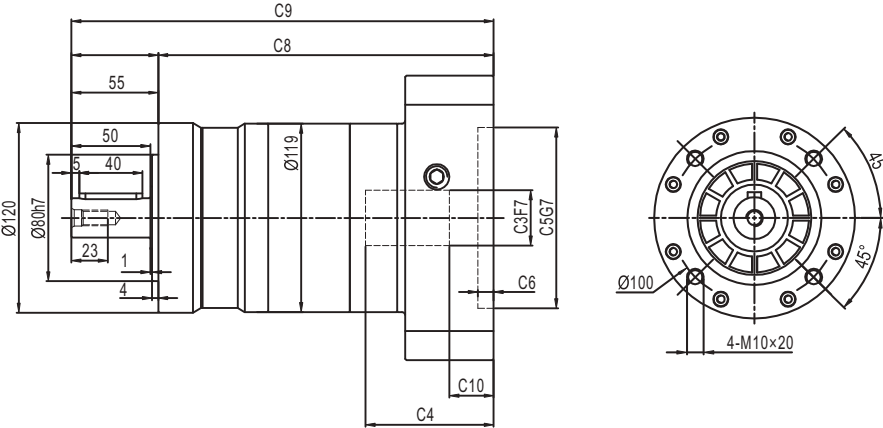


FG-120A-L2

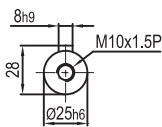
输入端/ INPUT



输出端 /OUTPUT



输出轴径/Output Diameter

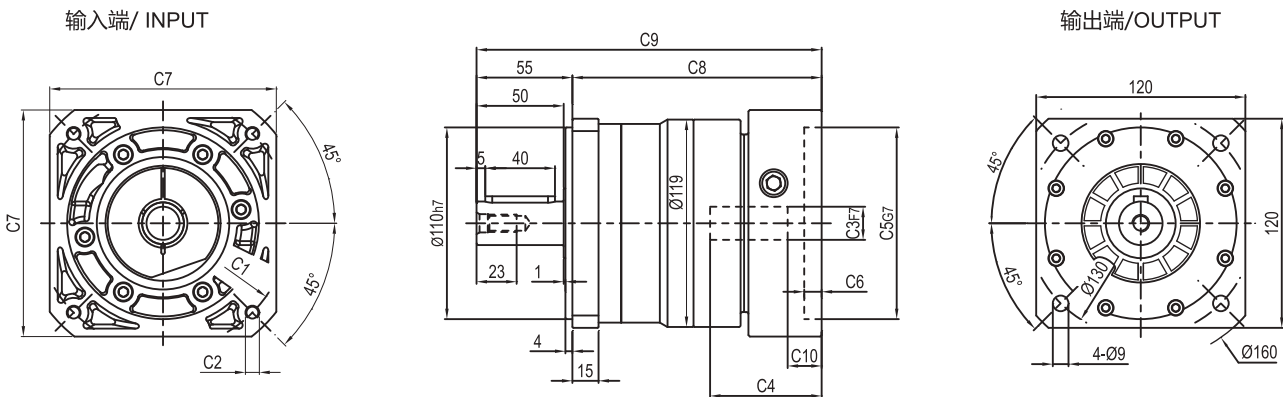


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FG-120A-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	194.5	249.5	19.5
FG-120AM1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	212	267	28

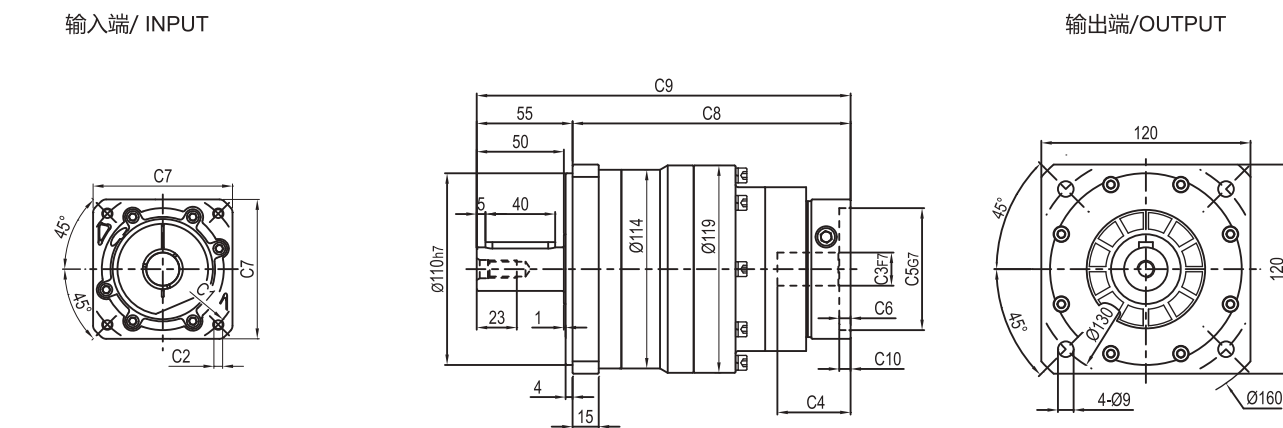
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

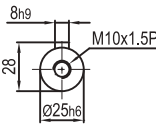
FGA-120-L1



FGA-120-L2



输出轴径/Output Diameter

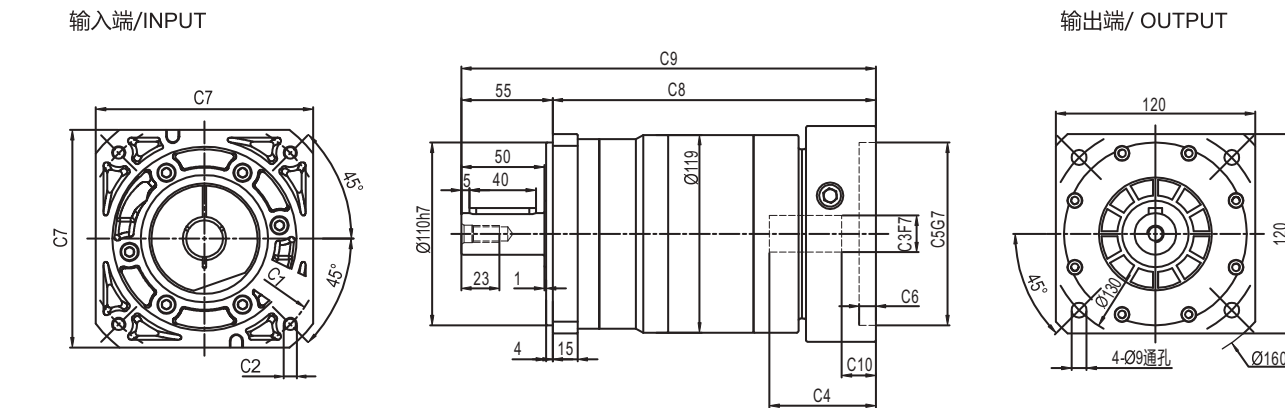


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FGA-120-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	143	198	19.5
FGA-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	160.5	215.5	28
FGA-120-L2	Ø90	4-M5x12, 4-M6x14	Ø19	42	Ø70	6.5	80	159.5	214.5	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	159.5	214.5	6
FGA-120M1-L2	Ø115	4-M8x20	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

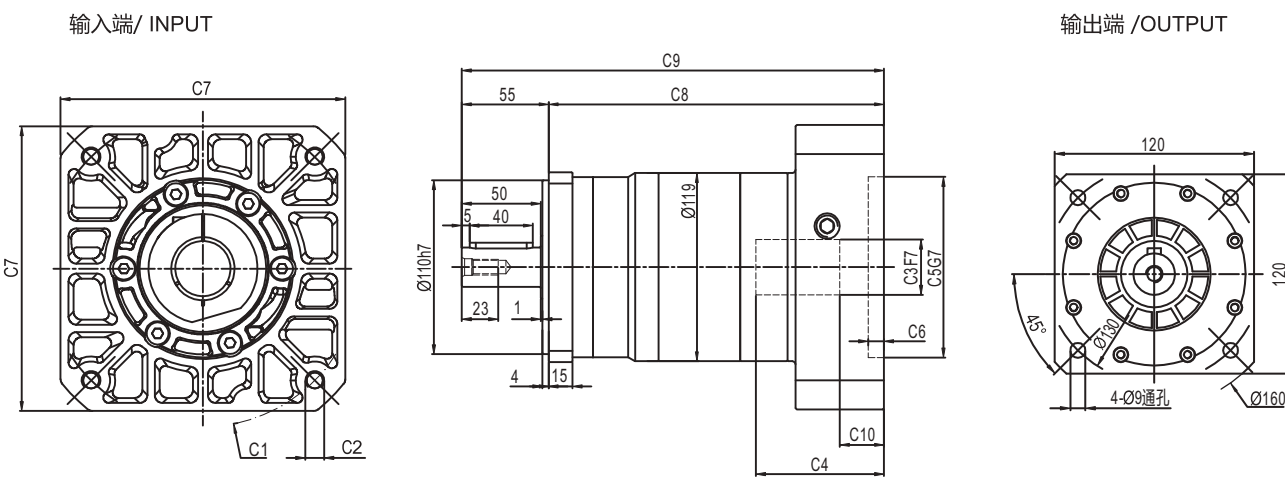
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

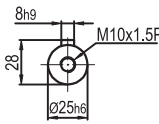
FGA-120A-L2



FGA-120A-L2



输出轴径/Output Diameter

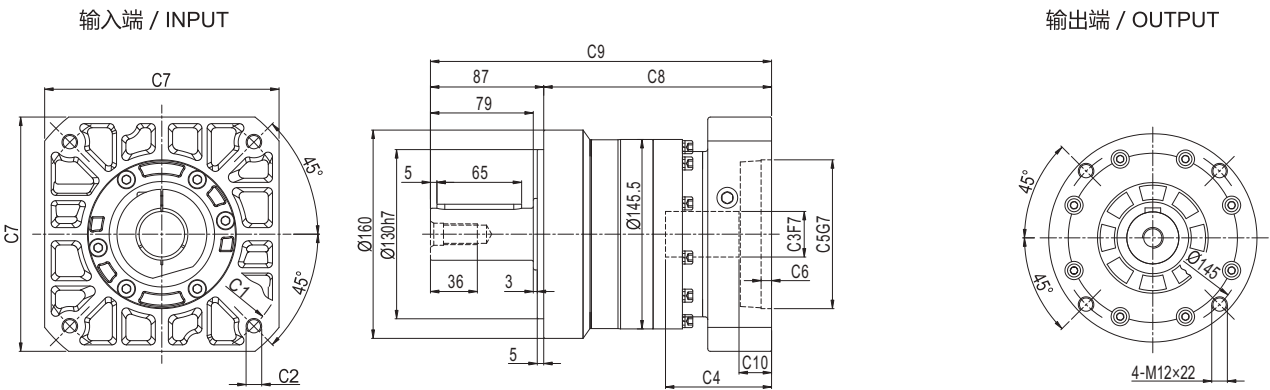


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FGA-120A-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	194.5	249.5	19.5
FGA-120AM1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	212	267	28

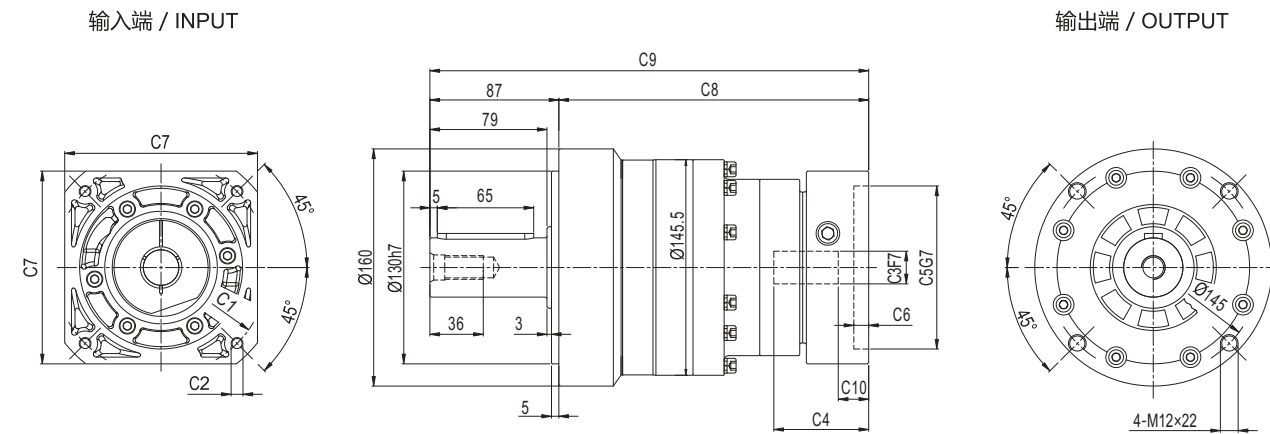
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

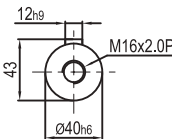
FG-160-L1



FG-160-L2



输出轴径/Output Diameter

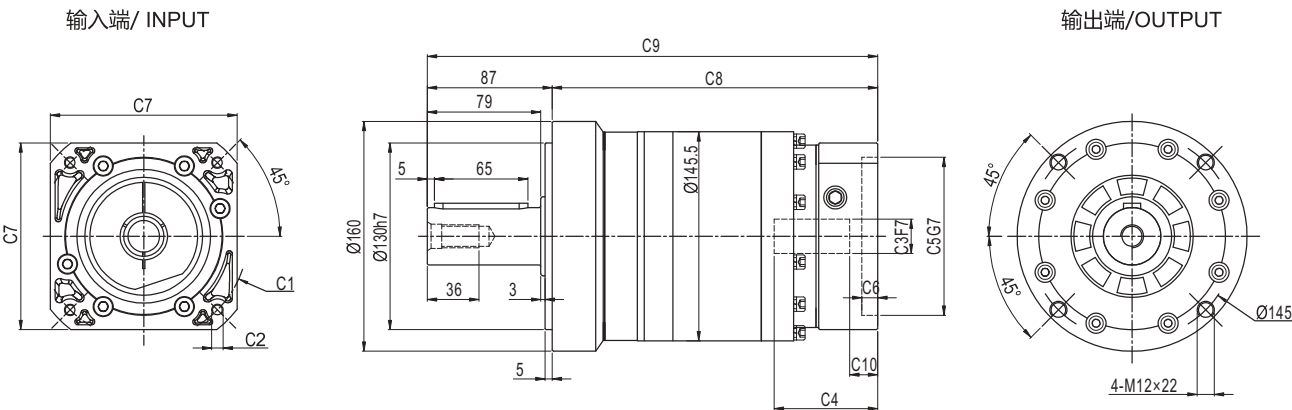


尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FG-160-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	165	252	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	175	262	25
FG-160-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	209	296	19.5
FG-160M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	226.5	313.5	28

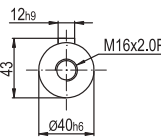
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

FG-160A-L2



输出轴径/Output Diameter



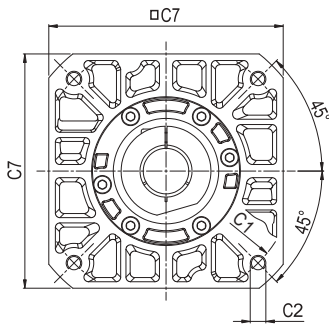
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FG-160A-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	226.5	313.5	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	236.5	323.5	25

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.

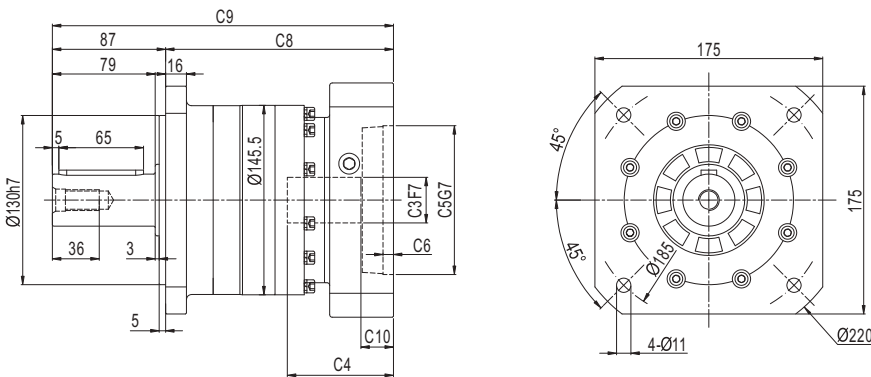
产品尺寸 / product dimension

FGA-160-L1

输入端 / INPUT

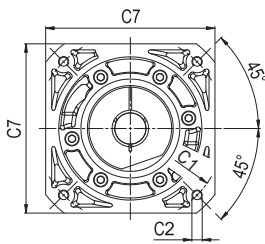


输出端 / OUTPUT

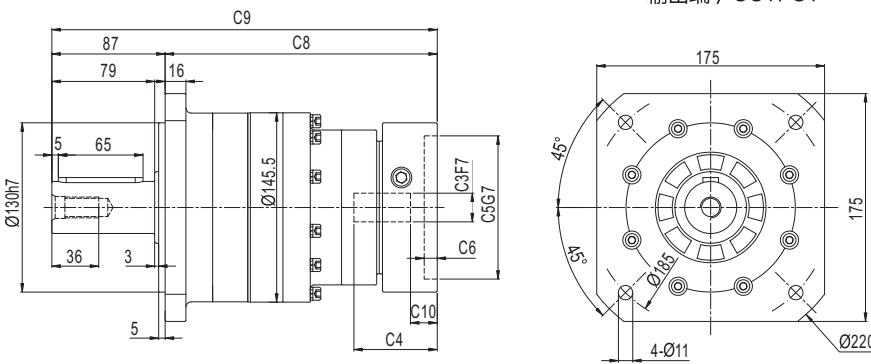


FGA-160-L2

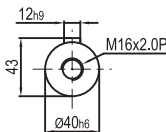
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



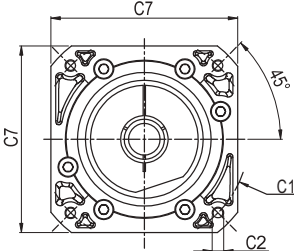
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FGA-160-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	165	252	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	175	262	25
FGA-160-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	209	296	19.5
FGA-160M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	226.5	313.5	28

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

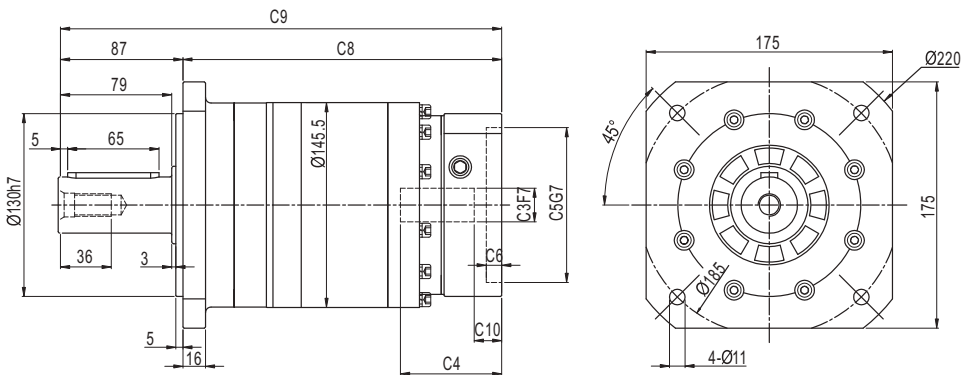
产品尺寸 / product dimension

FGA-160A-L2

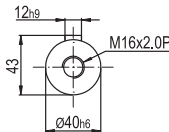
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



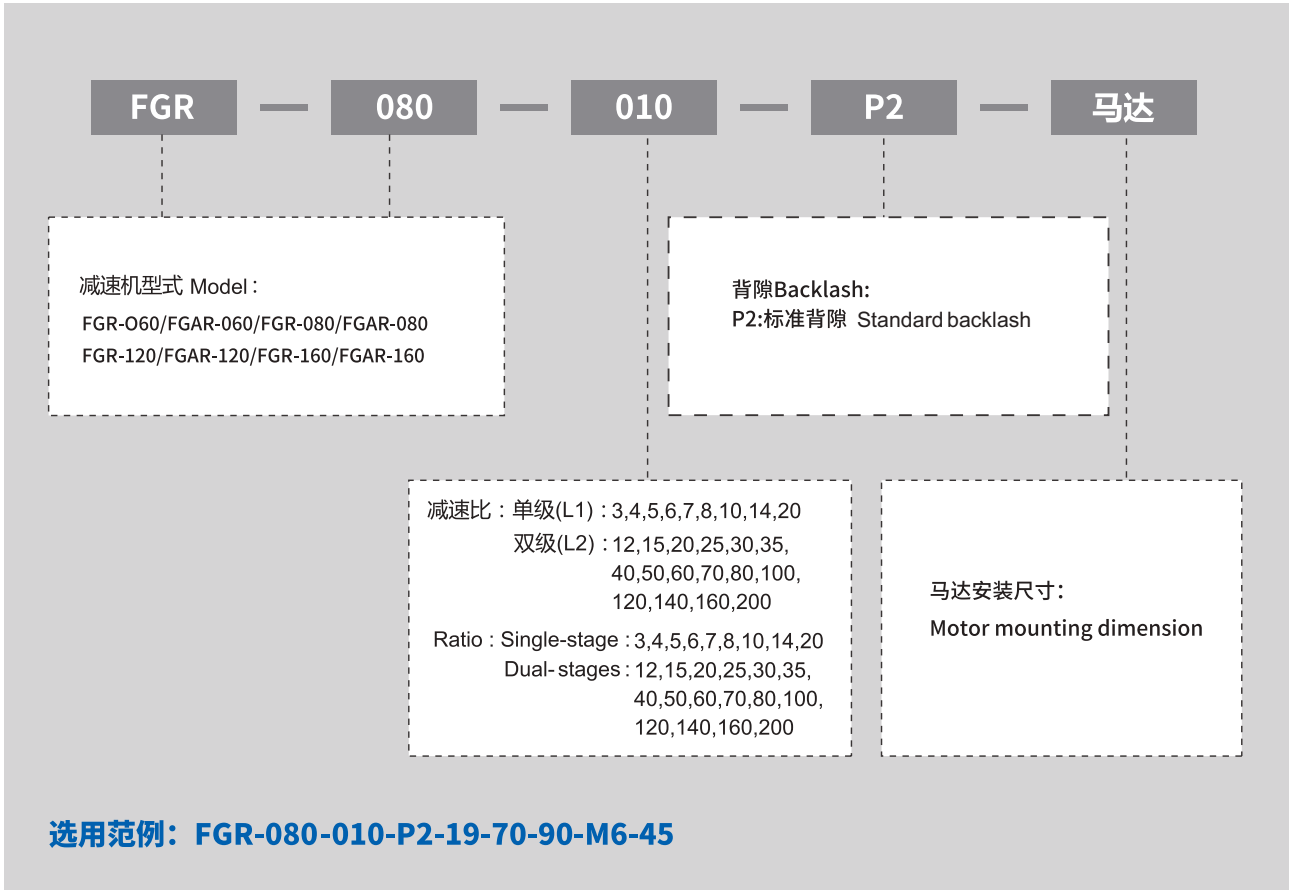
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
FGA-160A-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	226.5	313.5	19.5
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	236.5	323.5	25

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.

品质源三凯 口碑自然来



型号说明 / model description



SUCCESS BREEDS
SUCCESS

FGR/FGAR
SERIES

PRECISION PLANETARY
GEAR BOX

精密行星减速机

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技术参数 / technical specification

规格 Model		级数 Stage	减速比 ¹ Ratio	FGR606 FGAR060	FGR080 FGAR080	FGR080A FGAR080A	FGR120 FGAR120	FGR120A FGAR120A	FGR160 FGAR160	FGR160A FGAR160A
额定输出力矩T _{2N} Rated output torque	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	130	208	208	342	342
			15	55	130	130	208	208	342	342
			20	50	140	140	290	290	542	542
			25	60	160	160	330	330	650	650
			30	55	130	130	208	208	342	342
			35	60	160	160	330	330	650	650
			40	50	140	140	290	290	542	542
			50	60	160	160	330	330	650	650
			60	55	150	150	310	310	600	600
			70	60	160	160	330	330	650	650
			80	50	140	140	290	290	542	542
			100	60	160	160	330	330	650	650
			120	—	150	150	310	310	600	600
			140	—	140	140	300	300	550	550
			160	—	120	120	260	260	500	500
			200	—	100	100	230	230	450	450
最大输出力矩T _{2s} /Max.output torque	Nm	1,2	3~200	3倍额定输出力矩 3 times the rated output torque						
额定输入转速n ₁ /Rated input speed	rpm	1,2	3~200	5,000	4,000	4,000	4,000	4,000	3,000	3,000
最大输入转速n _{1s} /Max.input speed	rpm	1,2	3~200	10,000	8,000	8,000	8,000	8,000	6,000	6,000
标准背隙P2/Precision backlash	arcmin	1	3~20	≤13	≤13	≤13	13	≤13	≤13	≤13
		2	12~200	≤15	≤15	≤15	15	≤15	≤15	≤15
扭转刚性/Torsional rigidity	Nm/arcmin	1,2	3~200	7	14	14	25	25	50	50
容许径向力F _{2rB} ² /Allowable radial force	N	1,2	3~200	1,530	3,250	3,250	6,700	6,700	9,400	9,400
容许轴向力F _{2aB} ² /Allowable radial force	N	1,2	3~200	630	1,300	1,300	3,000	3,000	4,000	4,000
容许轴向力F _{2aB} ² /Allowable radial force	N	1,2	3~200	765	1,625	1,625	3,350	3,350	4,700	4,700
使用寿命/Life time	hr	1,2	3~200	20,000*						
效率η/Efficiency	%	1	3~20	≤95%						
		2	12~200	≤92%						
重量/Weight	kg	1	3~20	2.1	6.4	—	13	—	24.5	—
		2	12~200	2.5	7.8	7.8	14.2	14.2	27.5	27.5
使用温度/Operating temperature	℃	1,2	3~200	-10℃~+90℃						
润滑/Lubrication		1,2	3~200	合成润滑油脂 Synthetic lubricating grease						
防护等级/Ingress protection		1,2	3~200	IP65						
安装方向/Mount position		1,2	3~200	任意方向 Any direction						
噪音值(n=3000rpm)/Noise level	dB	1,2	3~200	≤63	≤65	≤65	≤68	≤68	≤70	≤70

减速机转动惯量 Gearbox moment of inertia

规格 Model		级数 Stage	减速比 ¹ Ratio	FGR606 FGAR060	FGR080 FGAR080	FGR080A FGAR080A	FGR120 FGAR120	FGR120A FGAR120A	FGR160 FGAR160	FGR160A FGAR160A
转动惯量J ₁ Moment of inertia	kg · cm ²	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	0.35	2.25	2.25	6.84	6.84
			50	0.09	0.31	0.31	1.87	1.87	6.25	6.25
			60	0.09	0.35	0.35	2.25	2.25	6.84	6.84
			70~100	0.09	0.31	0.31	1.87	1.87	6.25	6.25
			120~200	—	0.31	0.31	1.87	1.87	6.25	6.25

1.减速比Ratio(i= N_{in}/N_{out})

* 连续运转降低使用寿命二分之一。

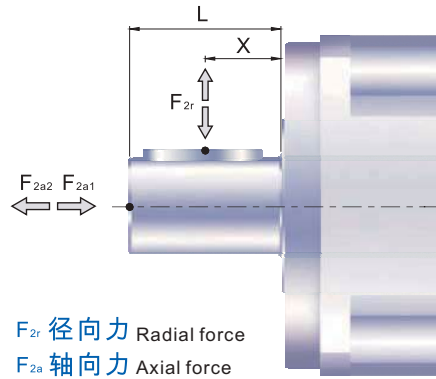
The lifetime will be shortened by half under continuous operation.

2.输出转速 100rpm 时，作用于输出轴中心位置。

When the output speed is 100rpm, it applies on the center of the output shaft.

减速机输出轴之容许径向力及轴向力

ALLOWABLE RADIAL AND AXIAL FORCES ON THE OUTPUT SHAFT OF THE GEAR REDUCER



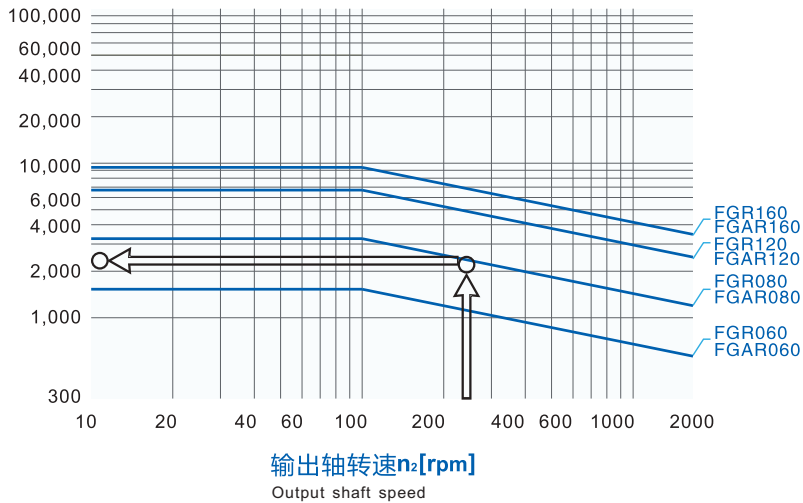
减速机输出轴所能承受之最大径向力及轴向力。端视内部支撑轴承之设计，减速机采用大尺寸的轴承及较大跨距的设计，其能承受更大的径向及轴向负荷。

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

F_{2r} 径向力 Radial force
F_{2a} 轴向力 Axial force

容许径向力 F_{2rB}【N】施力于轴中心位置

Permissible radial force F_{2rB}【N】apply force to the center of the shaft



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

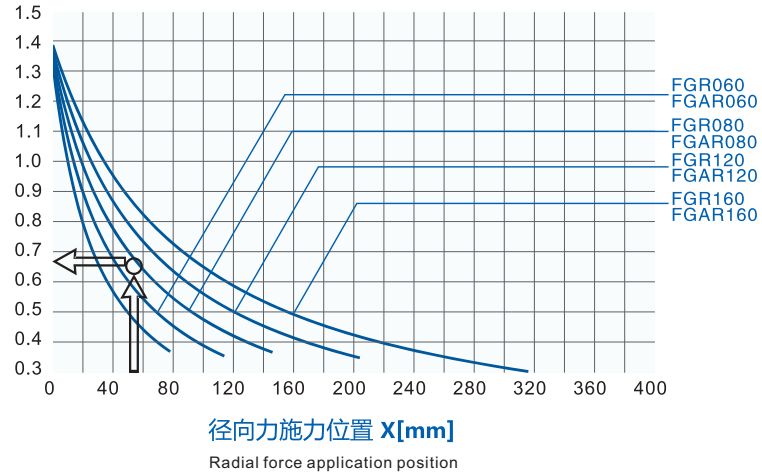
When the radial force F_{2r} is applied to the center of the shaft, i.e. X=1/2xL, the allowable radial force F_{2rB} that can be withstood by different specifications of reducers with a service life of 20,000hr* under different output speeds is as follows:

F_{2a1B}=0.2x F_{2rB}

F_{2a2B}=0.1x F_{2rB}

位置负荷系数K_b

Positional load coefficient



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，查出位置负荷系数K_b，在代入下列公式求出容许

When the radial force F_{2r} is not in the center of the shaft, the closer to the gearbox, that is, X<1/2xL, the allowable radial force that can be borne becomes larger, and the farther away from the reducer, i.e., X>1/2xL, the allowable force that can be borne becomes smaller.

径向力：Radial force

F'_{2rB}=K_bx F_{2rB}

轴向力：Axial force

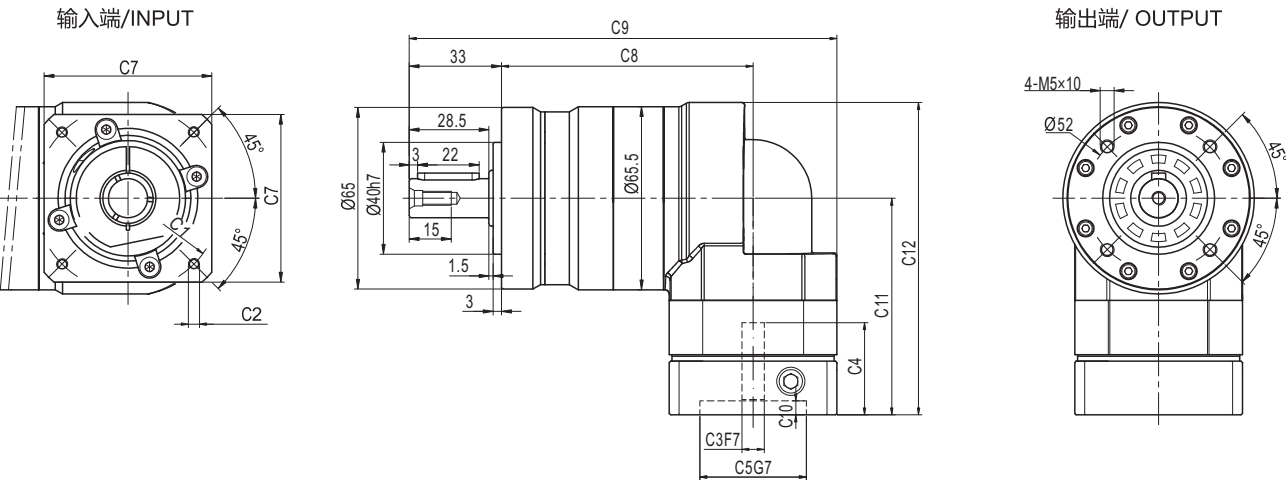
F'_{2a1B}=0.2x F'_{2rB}

F'_{2a2B}=0.1x F'_{2rB}

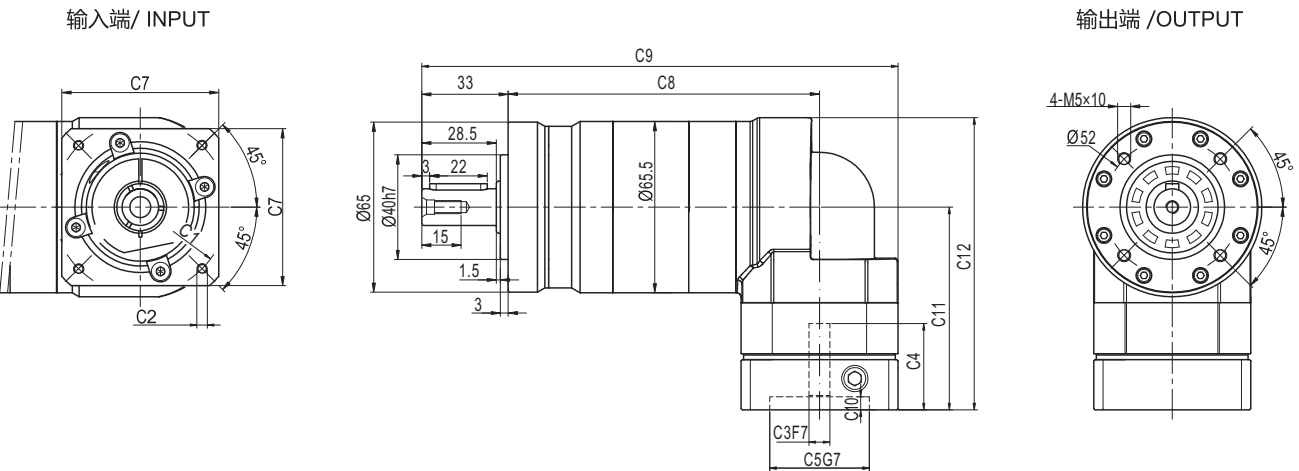
*连续运转降低使用寿命二分之一。The lifetime will be shortened by half under continuous operation.

产品尺寸 / product dimension

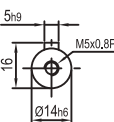
FGR-060-L1



FGR-060-L2



输出轴径/Output Diameter

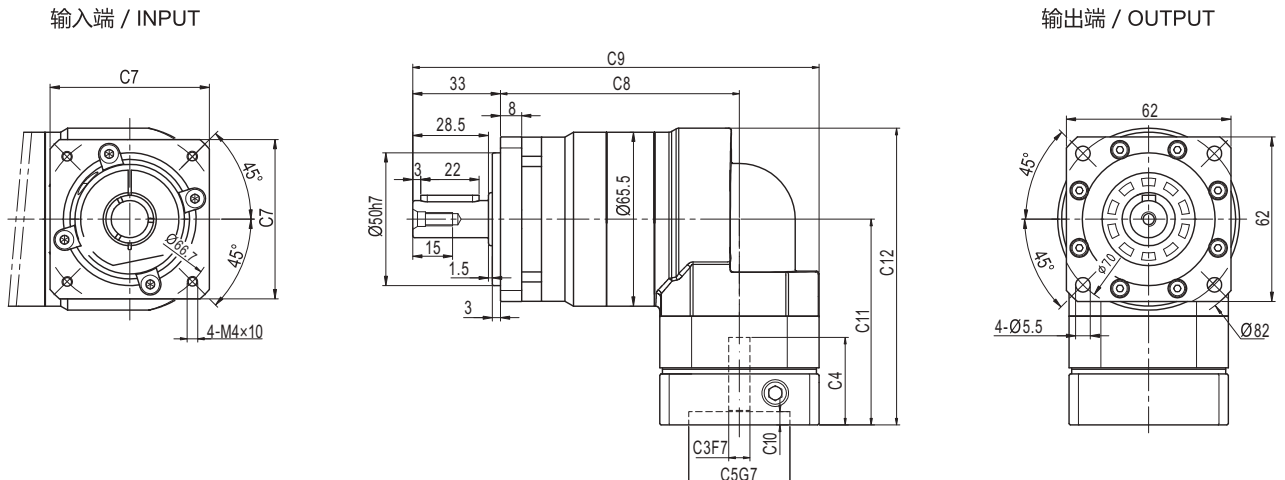


尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGR-060-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	90	153	5.5	77.5	111.75
FGR-060-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	119	182	5.5	77.5	111.75
FGR-060-L1	Ø70	4-M4x10,4-M5x12	Ø11, Ø14	33	Ø50	5	60	90	153	5.5	77.5	111.75
FGR-060-L2	Ø70	4-M4x10,4-M5x12	Ø11, Ø14	33	Ø50	5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

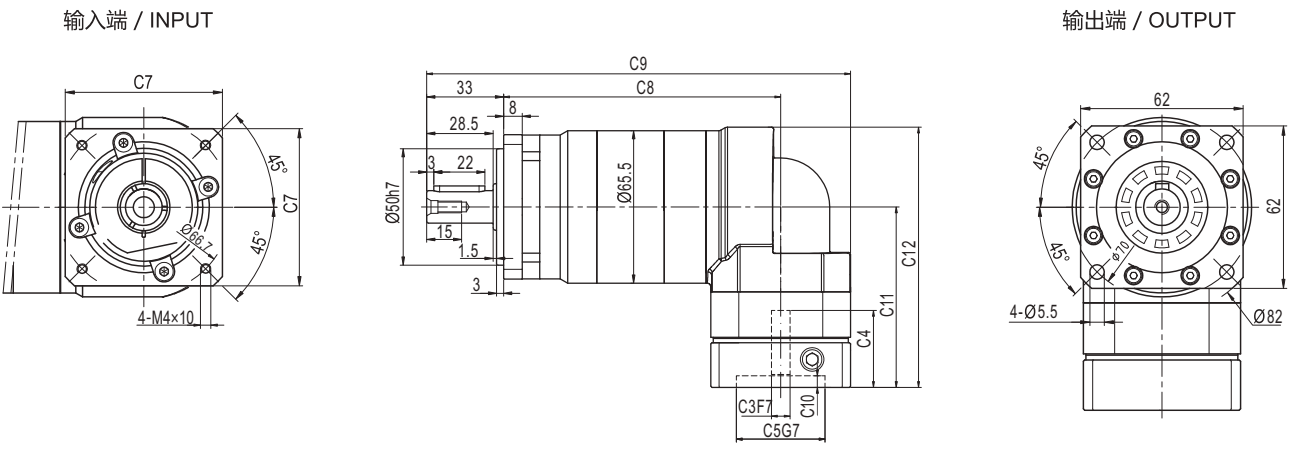
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

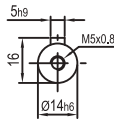
FGAR-060-L1



FGAR-060-L2



输出轴径/Output Diameter



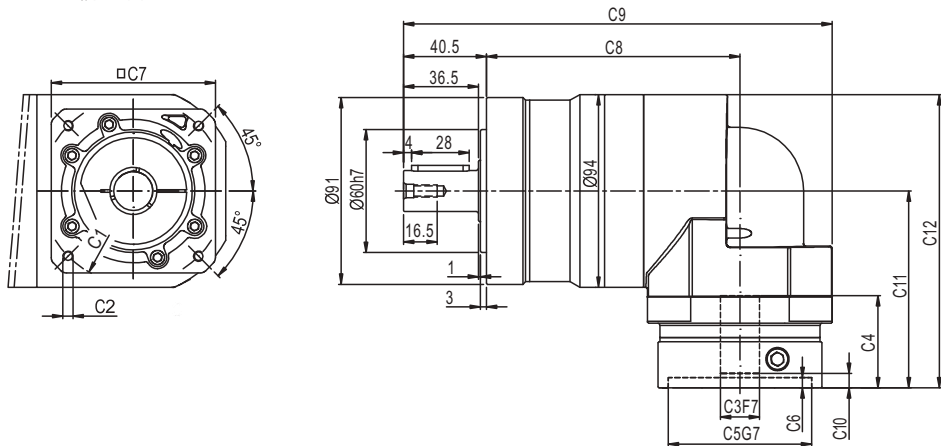
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGAR-060-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	90	153	5.5	77.5	111.75
FGAR-060-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	119	182	5.5	77.5	111.75
FGAR-060-L1	Ø70	4-M4x10,4-M5x12	Ø11, Ø14	33	Ø50	5	60	90	153	5.5	77.5	111.75
FGAR-060-L2	Ø70	4-M4x10,4-M5x12	Ø11, Ø14	33	Ø50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

*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~C7 are motor(metric standard) specific dimensions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

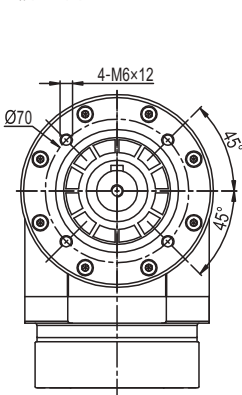
产品尺寸 / product dimension

FGR-080-L1

输入端/INPUT

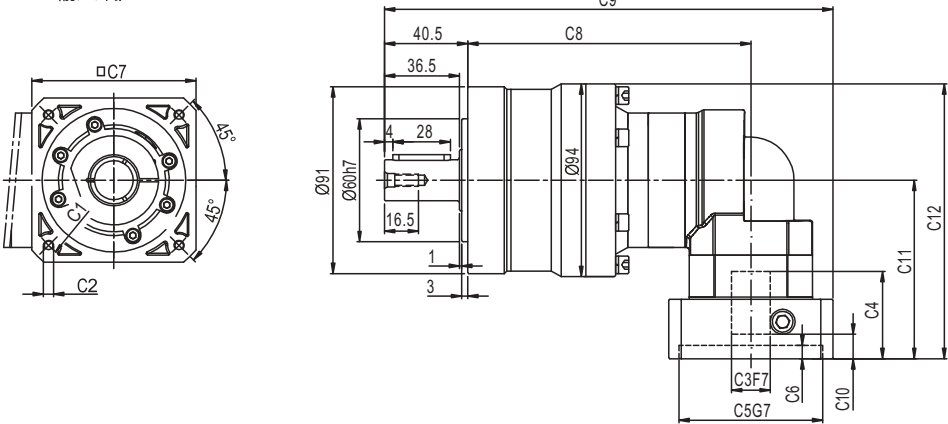


输出端/ OUTPUT

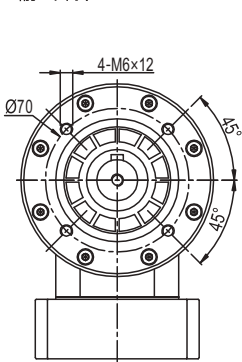


FGR-080-L2

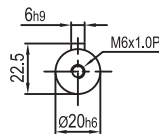
输入端/ INPUT



输出端/OUTPUT



输出轴径/Output Diameter



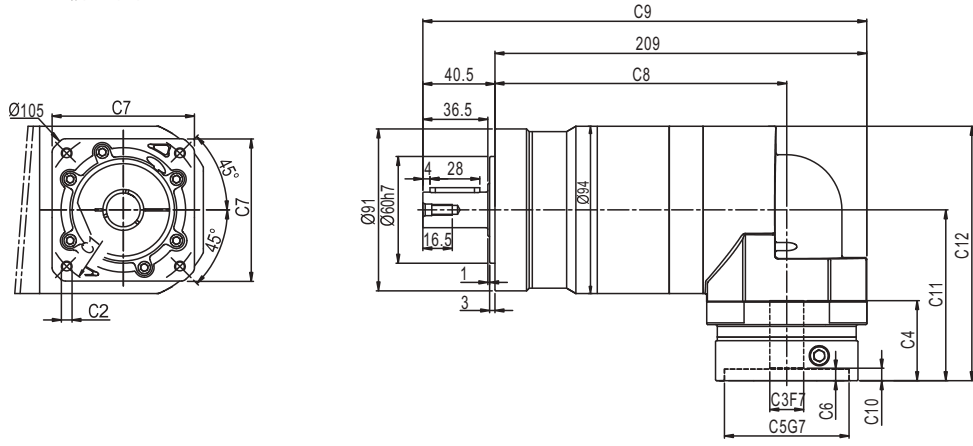
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGR-080-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	123.5	209	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	123.5	209	6	96	143
FGR-080M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	123.5	214	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	123.5	229	19	120	167
FGR-080-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 dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

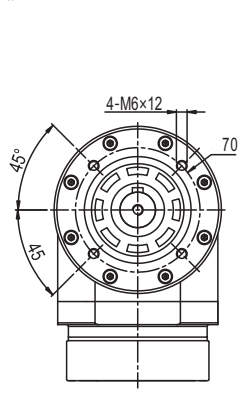
产品尺寸 / product dimension

FGR-080A-L2

输入端 / INPUT

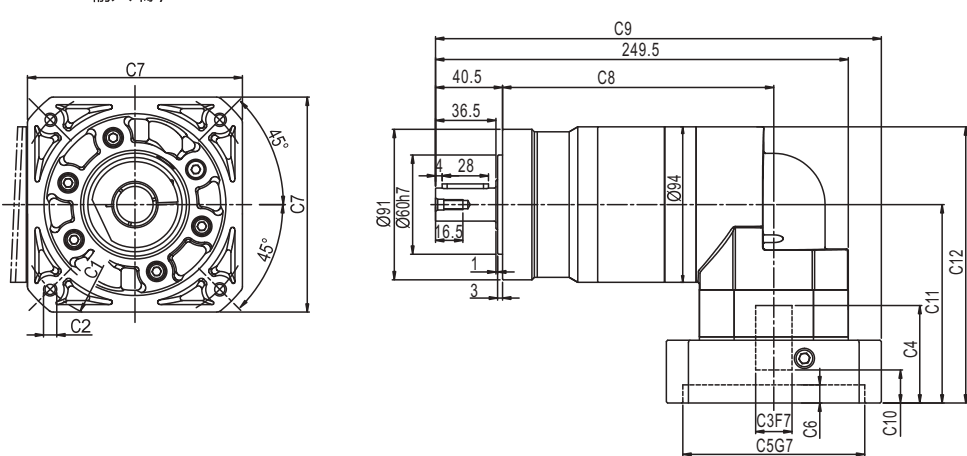


输出端 / OUTPUT

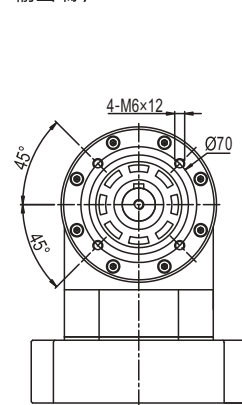


FGR-080A-L2

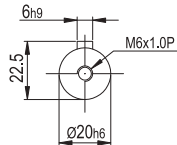
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



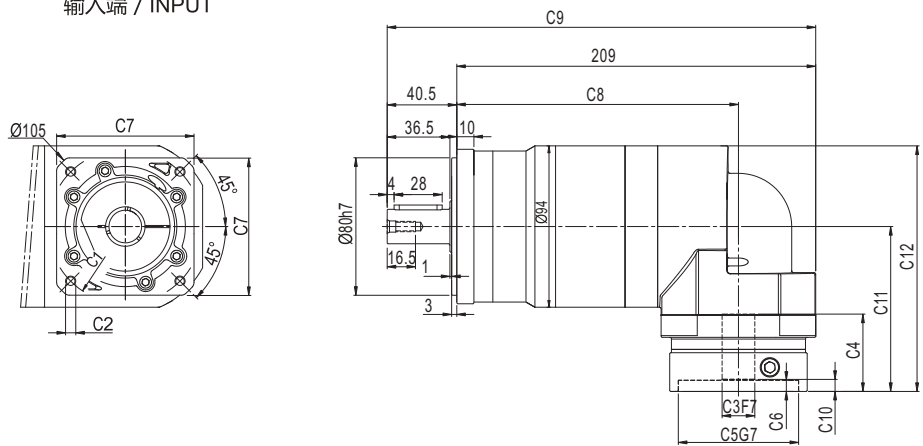
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGR-080A-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	164	249.5	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	164	249.5	6	96	143
FGR-080AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	164	254.5	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	10	130	164	269.5	19	120	167

*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 dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

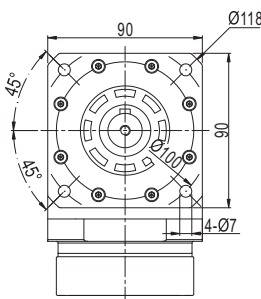
产品尺寸 / product dimension

FGAR-080-L1

输入端 / INPUT

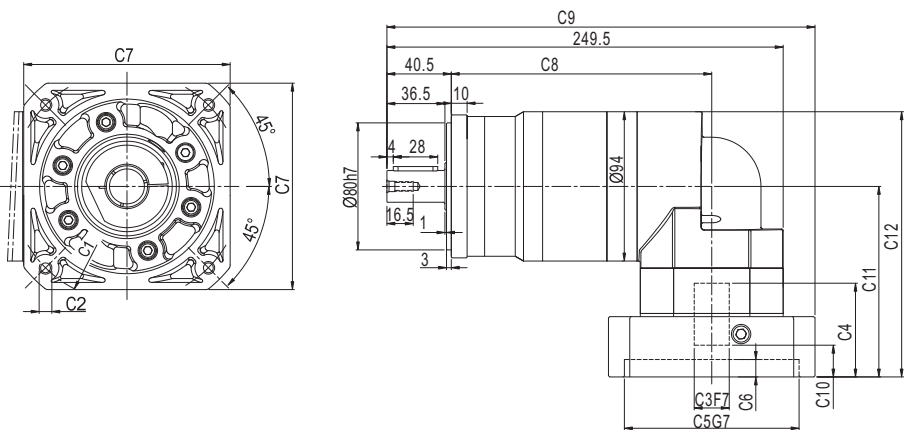


输出端 / OUTPUT

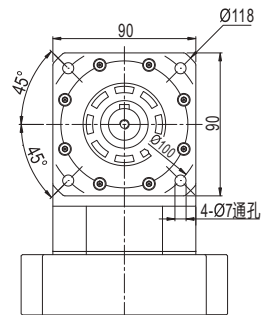


FGAR-080-L2

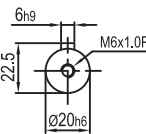
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



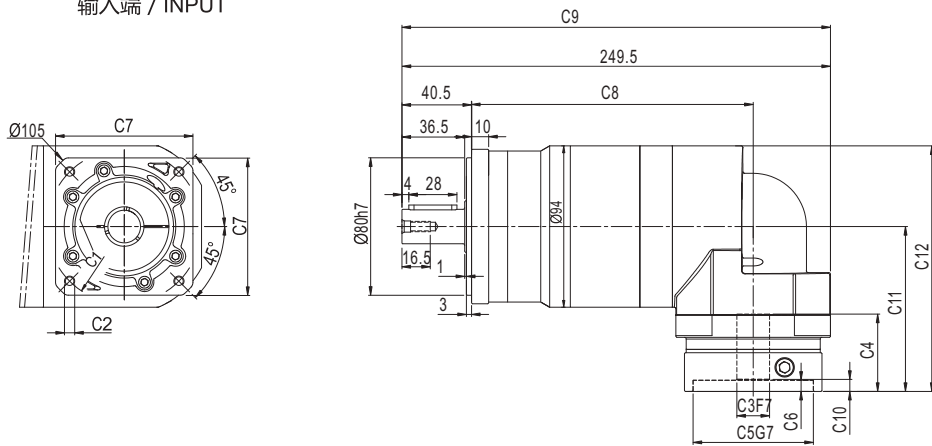
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGAR-080-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	123.5	209	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	123.5	209	6	96	143
FGAR-080M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	123.5	214	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	123.5	229	19	120	167
FGAR-080-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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

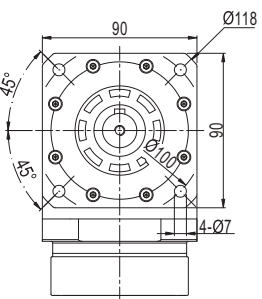
产品尺寸 / product dimension

FGAR-080A-L2

输入端 / INPUT

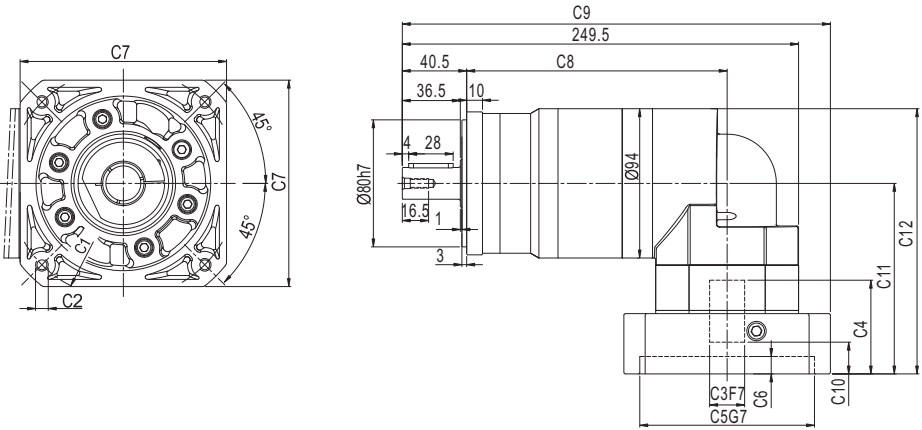


输出端 / OUTPUT

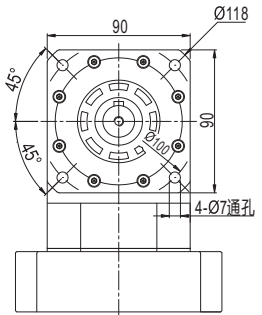


FGAR-080A-L2

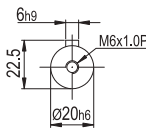
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



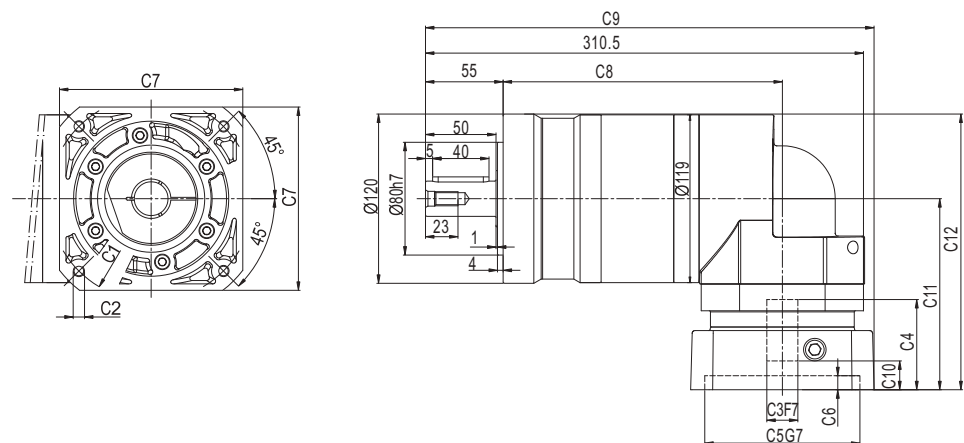
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGAR-080A-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	164	249.5	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	164	249.5	6	96	143
FGAR-080AM1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	164	254.5	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	10	130	164	269.5	19	120	167

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

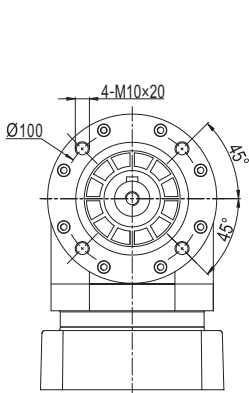
产品尺寸 / product dimension

FGR-120-L1

输入端/INPUT

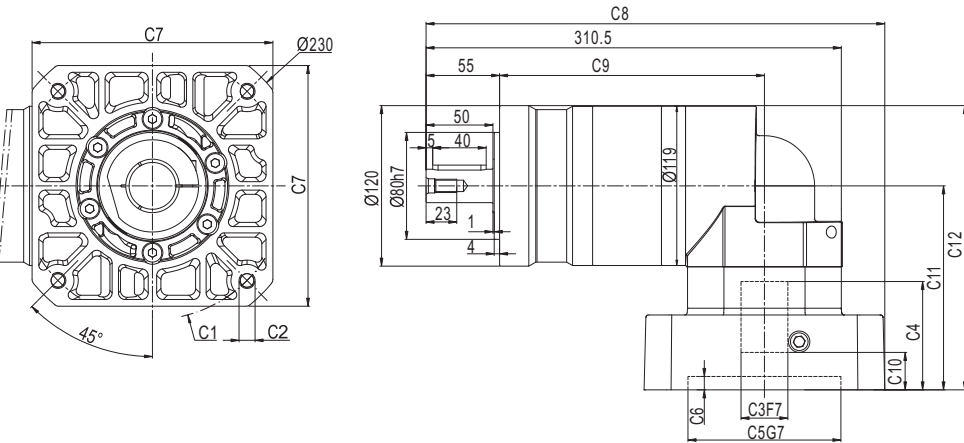


输出端/ OUTPUT

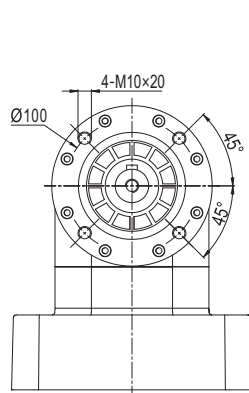


FGR-120-L2

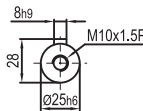
输入端/ INPUT



输出端 /OUTPUT



输出轴径/Output Diameter



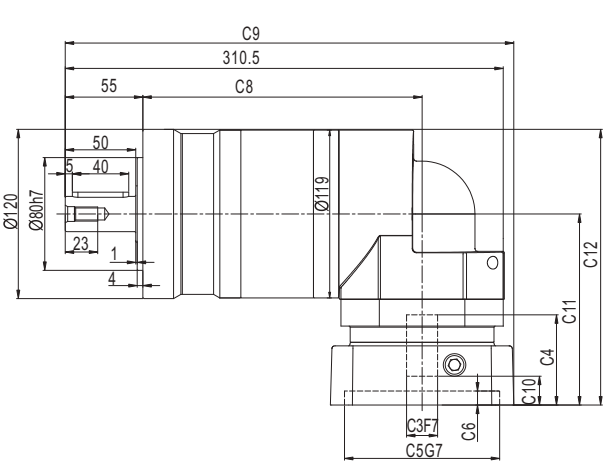
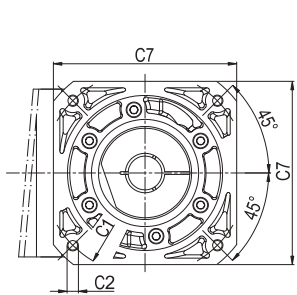
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGR-120-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	146.5	266.5	19.5	135.5	195.5
FGR-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	146.5	291.5	28	152.5	212.5
FGR-120-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	176.5	276.5	7	96	156
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

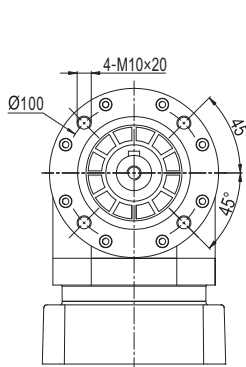
产品尺寸 / product dimension

FGR-120A-L2

输入端 / INPUT

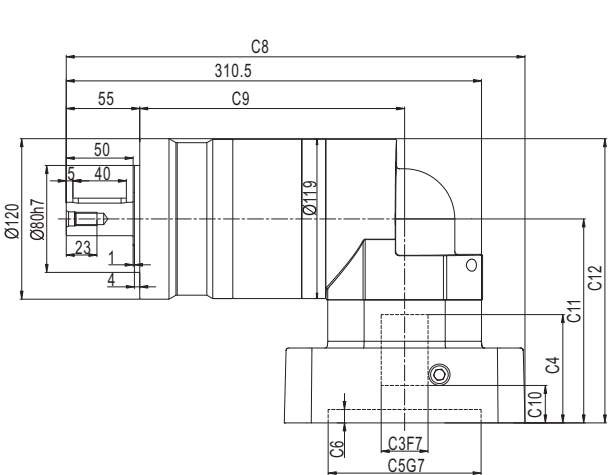
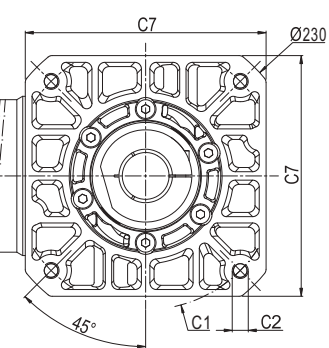


输出端 / OUTPUT

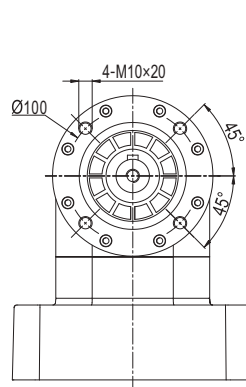


FGR-120A-L2

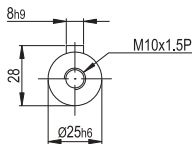
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



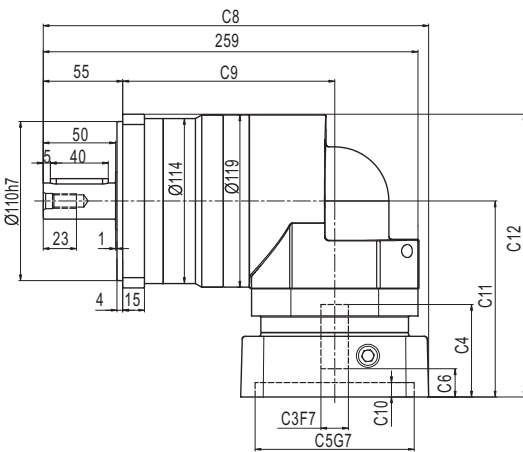
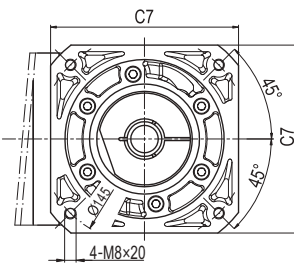
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGR-120A-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	198	318	19.5	135.5	195.5
FGR-120AM2-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	198	343	28	152.5	212.5

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

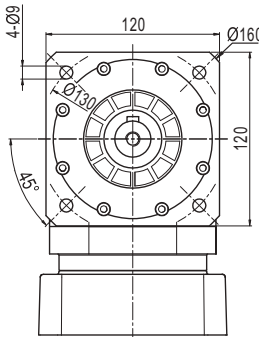
产品尺寸 / product dimension

FGAR-120 -L1

输入端 / INPUT

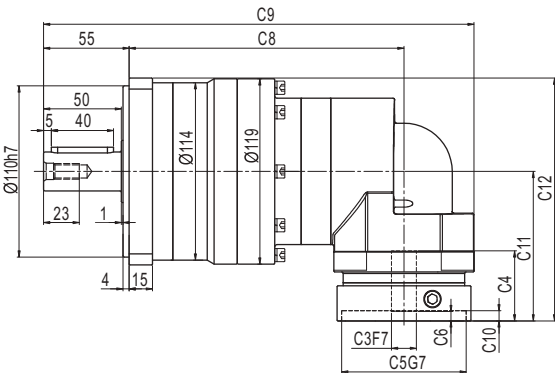
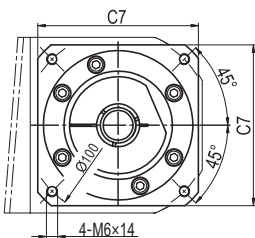


输出端 / OUTPUT

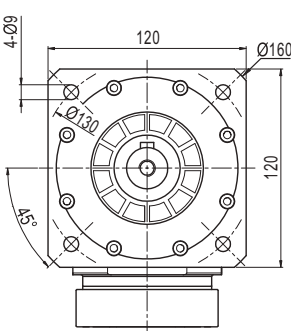


FGAR-120-L2

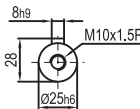
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



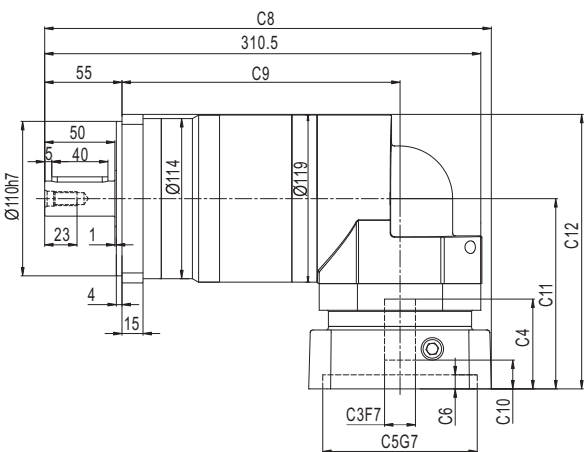
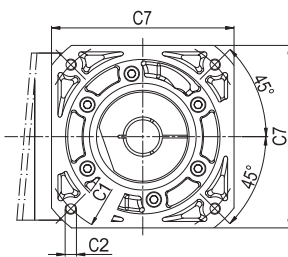
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGAR-120-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	146.5	266.5	19.5	135.5	195.5
FGAR-120M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	146.5	291.5	28	152.5	212.5
FGAR-120-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	176.5	276.5	7	96	156
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

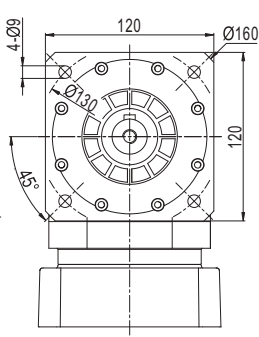
产品尺寸 / product dimension

FGAR-120A-L2

输入端 / INPUT

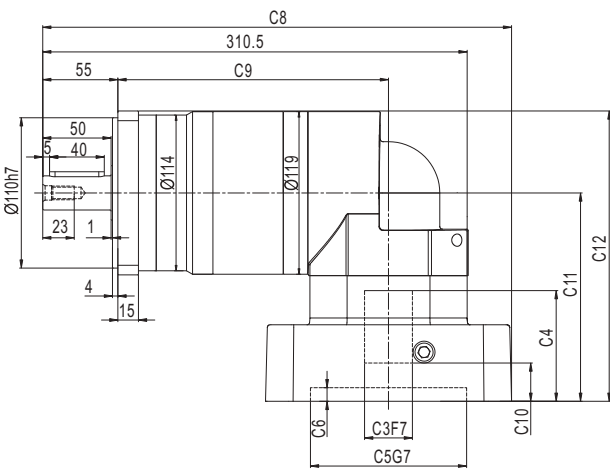
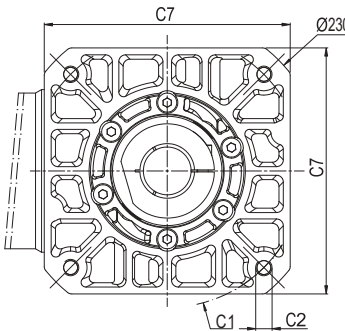


输出端 / OUTPUT

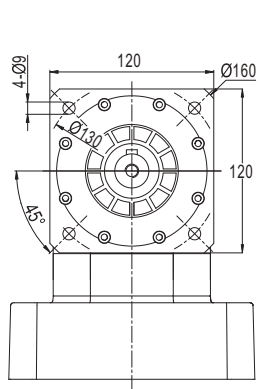


FGAR-120A-L2

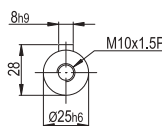
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



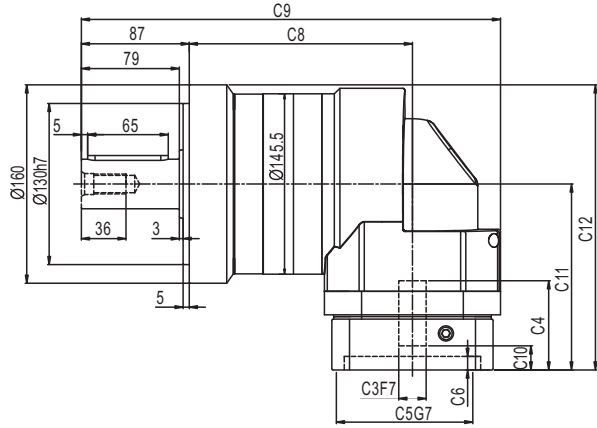
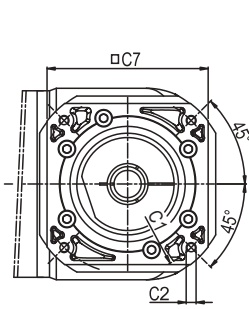
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGAR-120A-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	198	318	19.5	135.5	195.5
FGAR-120AM1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	198	343	28	152.5	212.5

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

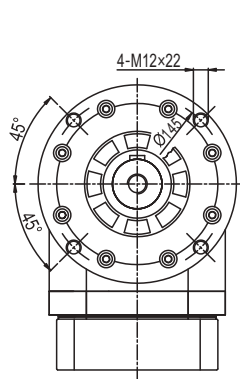
产品尺寸 / product dimension

FGR-160-L1

输入端 / INPUT

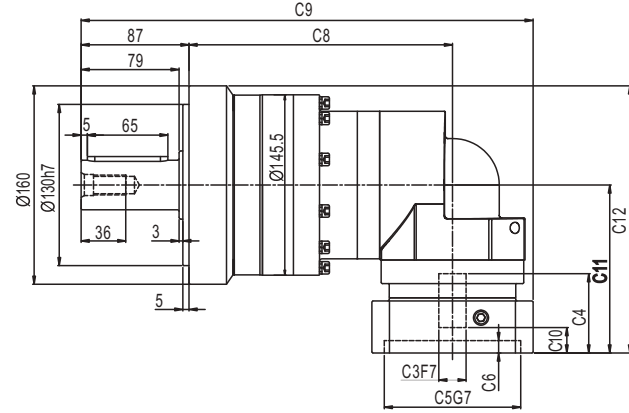
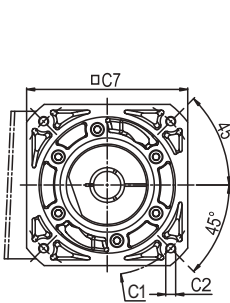


输出端 / OUTPUT

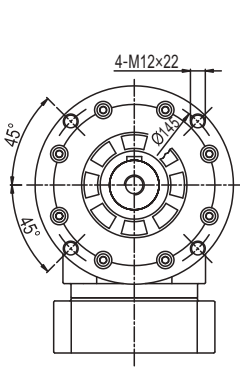


FGR-160-L2

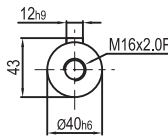
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter



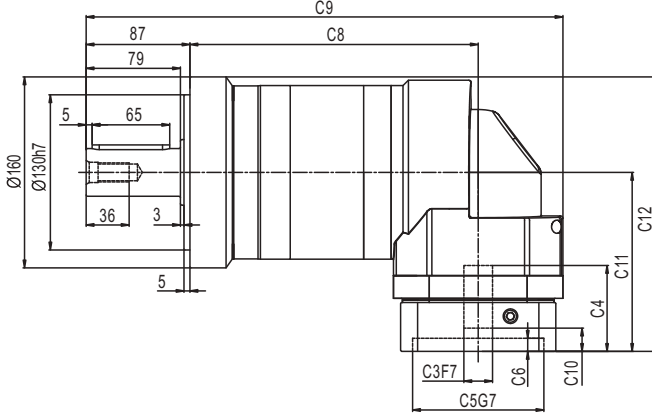
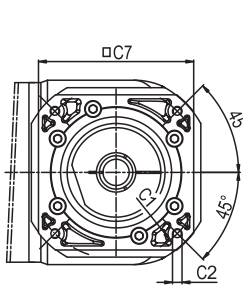
尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGR-160-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	180	338	19.5	150	230
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	180	357	25	160	240
FGR-160-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	212.5	364.5	19.5	135.5	215.5
FGR-160M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	212.5	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~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

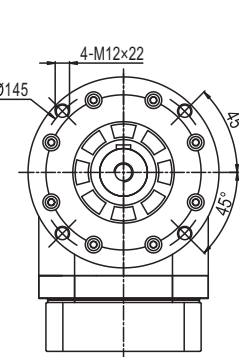
产品尺寸 / product dimension

FGR-160A-L2

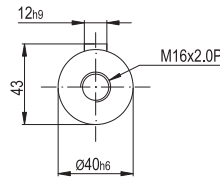
输入端 / INPUT



输出端 / OUTPUT



输出轴径/Output Diameter

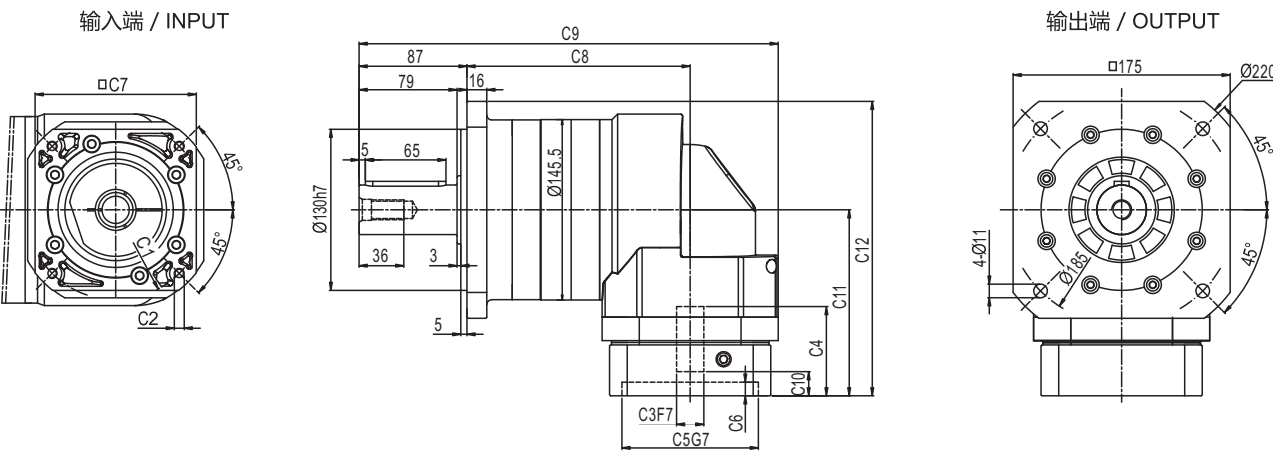


尺寸Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGR-160A-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	241.5	399.5	19.5	150	230
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	241.5	418.5	25	160	240

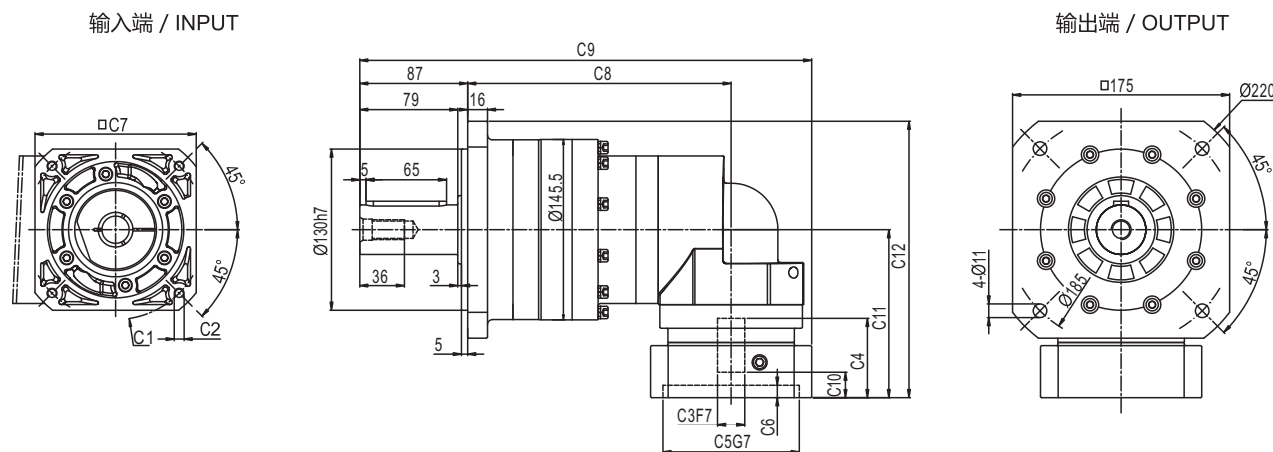
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.

产品尺寸 / product dimension

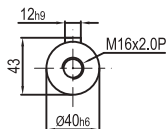
FGAR-160-L1



FGAR-160-L2



输出轴径/Output Diameter

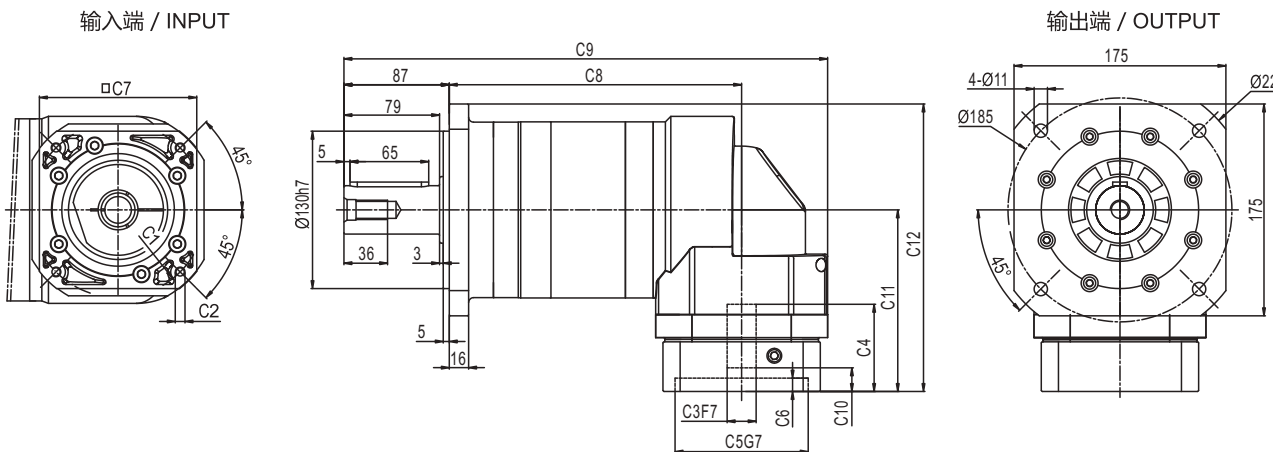


尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGAR-160-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	180	338	19.5	150	237.5
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	180	357	25	160	247.5
FGAR-160-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	212.5	364.5	19.5	135.5	223
FGAR-160M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180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

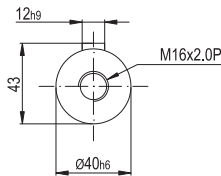
*C1~C7是公制标准马达连接板之尺寸，可根据客户要求单独定做。
*C1~C7 are motor(metric standard) specific dimenisions, which could be customized.
*M1:极限孔(版本号)
*M1:Limit hole (Version number)

产品尺寸 / product dimension

FGAR-160A-L2



输出轴径/Output Diameter



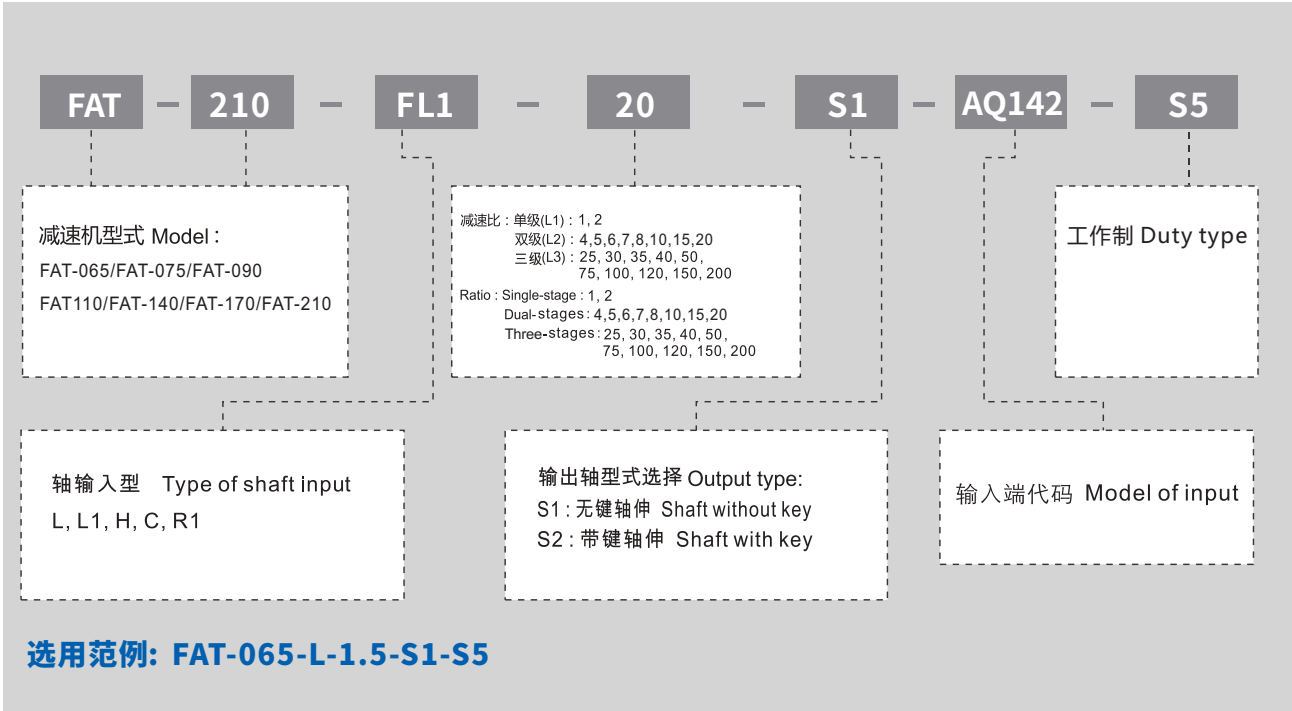
尺寸 Size	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
FGAR-160A-L2	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	241.5	399.5	19.5	150	237.5
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	241.5	418.5	25	160	247.5

*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~C7 are motor(metric standard) specific dimenisions, which could be customized.

品质源三凯 口碑自然来



型号说明 / model description



SUCCESS BREEDS
SUCCESS

FAT
SERIES

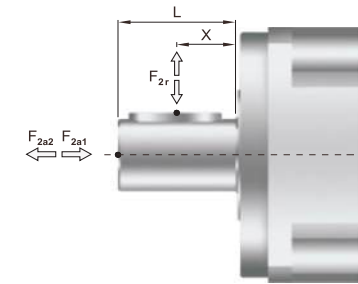
PRECISION PLANETARY
GEAR BOX

精密行星减速机

WWW.ZJSKGR.COM

减速机输出轴之容许径向力及轴向力

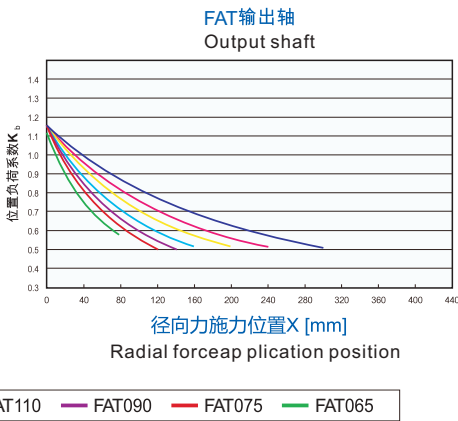
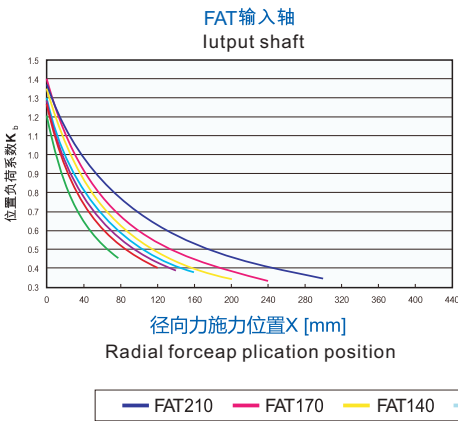
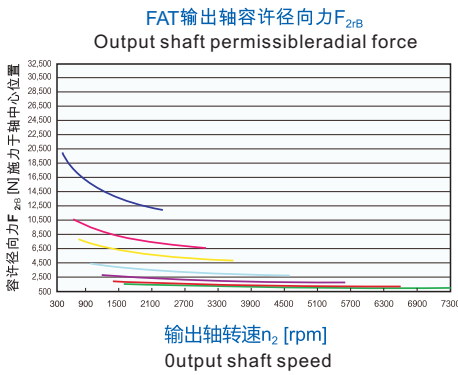
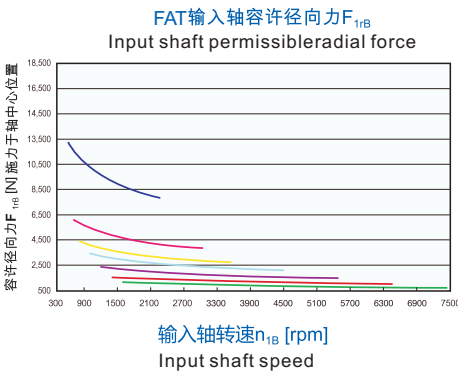
ALLOWABLE RADIAL AND AXIAL FORCES ON THE OUTPUT SHAFT OF THE GEAR REDUCER



减速机输出轴所能承受的最大径向力和轴向力，取决于内部支撑轴承的设计。采用大跨距设计，选择大承载力轴承，获得最大的径向力和轴向力承载能力。

The permitted radial and axial loads on output shaft depends on the design of the gearbox supporting bearing. Large span design and large bearing capacity are adopted, to obtain the maximum bearing capacity of radial and axial loads.

F_{2r} 径向力 Radial force
 F_{2a} 轴向力 Axial force



当径向力 F_{2r} 施力于轴中心位置即 $X=1/2 \times L$ 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_{2B} ，请参照左图，而能承受之容许轴向力 F_{2aB} ，为

When the radial force F_{2r} is applied to the center of the shaft, i.e. $X=1/2 \times L$, the allowable radial force F_{2B} that can be withstood by different specifications of reducers with a service life of 20,000hr* under different output speeds is as follows:

$F_{2a1B} = 0.2 \times F_{2B}$
 $F_{2a2B} = 0.1 \times F_{2B}$

当径向力 F_{2r} 施力不在轴中心位置时，越靠近减速机即 $X < 1/2 \times L$ ，所能承受之容许径向力变大，越远离减速机即 $X > 1/2 \times L$ 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 ，查出位置负荷系数 K_b ，在代入下列公式求出容许

When the radial force F_{2r} is not in the center of the shaft, the closer to the gearbox, that is, $X < 1/2 \times L$, the allowable radial force that can be borne becomes larger, and the farther away from the reducer, i.e., $X > 1/2 \times L$, the allowable force that can be borne becomes smaller.

径向力 : Radial force
 $F'_{2rB} = K_b \times F_{2B}$
轴向力 : Axial force
 $F'_{2a1B} = 0.2 \times F'_{2rB}$
 $F'_{2a2B} = 0.1 \times F'_{2rB}$

产品图片 / product dimension



FAT-L



FAT-FL



FAT-H



FAT-FH



FAT-C



FAT-FC

技术参数 / technical specification

轴输入型 Shaft input type (单位: mm) (Unit:mm)

规 格 Model		级 数 Stage	减速比 ¹ Ratio	FAT065 L FAT065 L1 FAT065 H FAT065 C FAT065 R1	FAT075 L FAT075 L1 FAT075 H FAT075 C FAT075 R1	FAT090 L FAT090 L1 FAT090 H FAT090 C FAT090 R1	FAT110 L FAT110 L1 FAT110 H FAT110 C FAT110 R1	FAT140 L FAT140 L1 FAT140 H FAT140 C FAT140 R1	FAT170 L FAT170 L1 FAT170 H FAT170 C FAT170 R1	FAT210 L FAT210 L1 FAT210 H FAT210 C FAT210 R1
额定输出力矩 T _{2N} Rated output torque	Nm	1	1	25	45	78	150	360	585	1,300
			2	24	42	68	150	330	544	1,220
最大加速力矩 T _{2a} Maximum acceleration moment	Nm	1	1~2	1.5 倍额定输出力矩（1.5 times of Nominal Output Torque）						
最大加速输入转速 n _{1a} Maximum acceleration input speed	rpm	1	1~2	7,500	6,500	5,500	4,500	3,500	3,000	2,200
背隙 ² Backlash	arcmin	1	1~2	≤6	≤6	≤6	≤6	≤6	≤6	6
最大输入轴径向力 F _{1rB} Maximum input shaft radial force	N	1	1~2	700	950	1,450	2,100	2,700	3,800	7,800
最大输出轴径向力 F _{2rB} Maximum loutput shaft radial force	N	1	1~2	900	1,100	1,700	2,700	4,800	6,600	11,500
最大输入轴轴向力 F _{1aB} Maximum input shaft axial force	N	1	1~2	350	425	725	1,050	1,350	1,900	3,900
最大输出轴轴向力 F _{2aB} Maximum output shaft axial force	N	1	1~2	450	550	850	1,350	2,400	3,300	5,750
使用寿命 Life time	h	1	1~2	20,000(S5工作制/S5 working mode)						
效率 η Efficiency	%	1	1~2	≥95%						
使用温度 Operating temperature	℃	1	1~2	-10℃ ~ 90℃						
润滑 lubrication				合成润滑油（Synthetic lubrication oils）						
噪音值（n ₁ =1500rpm,无负载） ⁵ Noise level(nl=1500rpm, no load)	dB (A)	1	1~2	≤68	≤70	≤74	≤76	≤77	≤78	≤80

转动惯量 Moment of inertia (单位: mm) (Unit:mm)

规 格 Model	级 数 Stage	减速比 ¹ Ratio	FAT065 L	FAT075 L	FAT090 L	FAT110 L	FAT140 L	FAT170 L	FAT210 L
			FAT065 L1	FAT075 L1	FAT090 L1	FAT110 L1	FAT140 L1	FAT170 L1	FAT210 L1
			FAT065 H	FAT075 H	FAT090 H	FAT110 H	FAT140 H	FAT170 H	FAT210 H
			FAT065 C	FAT075 C	FAT090 C	FAT110 C	FAT140 C	FAT170 C	FAT210 C
			FAT065 R1	FAT075 R1	FAT090 R1	FAT110 R1	FAT140 R1	FAT170 R1	FAT210 R1
转动惯量 J ₁ (kg · cm ²) Mass Moments of Inertia J ₁	1	1	0.51	1.30	3.16	7.70	23.57	58.99	195.40
		2	0.44	1.11	2.70	6.31	17.75	45.35	140.24

重量 Weight (单位: mm) (Unit:mm)

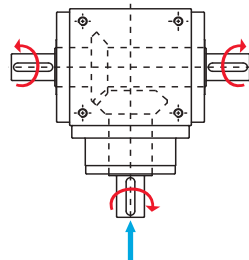
规 格 Model		级 数 Stage	减速比 ¹ Ratio	FAT065	FAT075	FAT090	FAT110	FAT140	FAT170	FAT210
L 系列 (Series)	kg	1	1~2	2.6	4.2	6.8	11.6	19.8	34.8	66.2
L1 系列 (Series)		1	1~2	2.6	4.1	6.7	11.5	19.5	34.2	65.1
H 系列 (Series)		1	1~2	2.5	3.9	6.4	11.0	18.1	31.6	60.0
C 系列 (Series)		1	1~2	2.8	4.2	6.9	11.4	19.6	33.7	63.3
R1 系列 (Series)		1	1~2	2.6	4.1	6.7	11.5	19.5	34.2	65.1

1.上述性能参数,均基于减速器运行在S5工作制下.如在S1工作制下运行,请与三凯联系。
2.:背隙值在2%额定力矩T_{2N}的扭力下所测得。

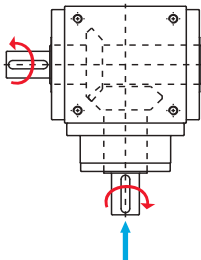
1. The above performance parameters are based on the gearbox operating at duty type S5 If it operates at duty type S1, please contact SKGR.
2.The above backlash is measured under at 2% rated tbrque T_{2N}

旋向/ rotate directions

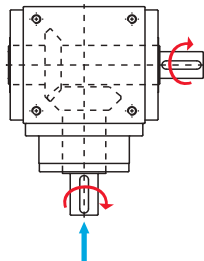
轴输入型 Shaft input type



FAT-L FAT-H FAT-C
FAT-FL FAT-FH FAT-FC

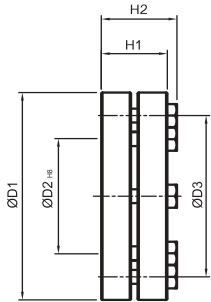


FAT-L1 FAT-FL1



FAT-R1 FAT-FR1

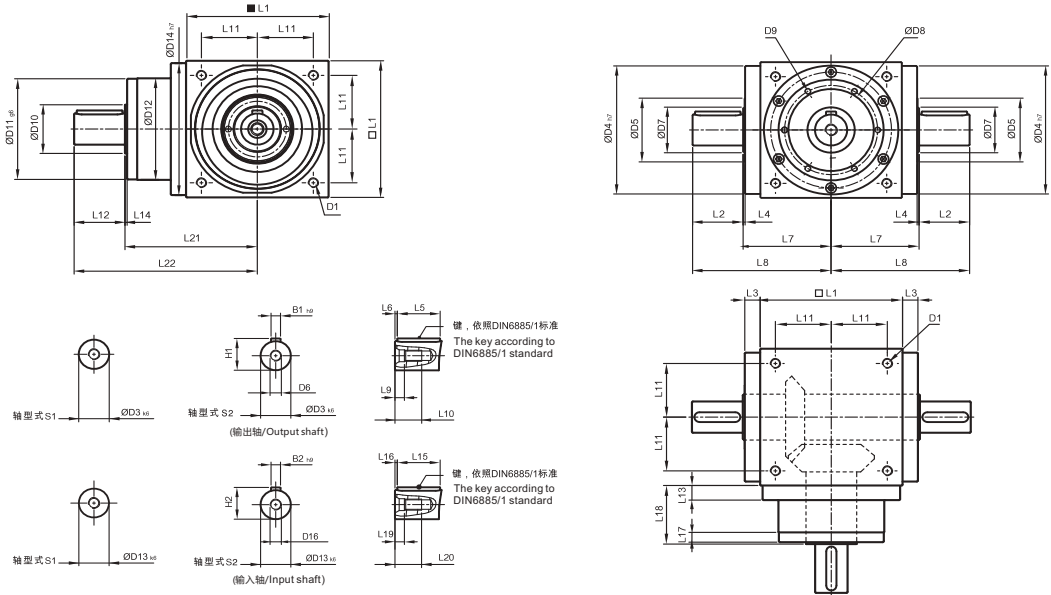
轴胀紧套 Shrink discs



FAT..C FAT..TC	D1	D2	D3	H1	H2
SSD-d16xdw14	41	16	26	15	18.5
SSD-d22xdw18	50	22	36	19.5	23
SSD-d25xdw22	50	25	38	19.5	23
SSD-d44xdw32	80	44	61	25.5	29.5
SSD-d50xdw40	90	50	70	27.5	31.5
SSD-d62xdw50	110	62	86	30.5	34.5
SSD-d68xdw55	115	68	86	30.5	34.5
SSD-d75xdw60	138	75	100	32.5	38

产品尺寸 / product dimension

FAT-L, 1 stage

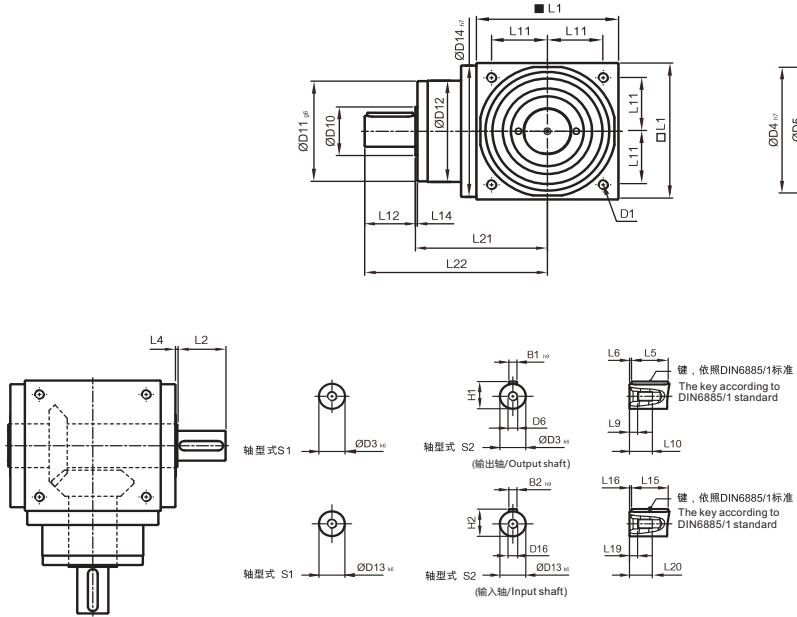


(单位: mm) (Unit:mm)

规格 Model	FAT065 L	FAT075 L	FAT090 L	FAT110 L	FAT140 L	FAT170 L	FAT210 L
D1	M4	M6	M6	M8	M10	M12	M16
D3 _{k6}	13	16	18	22	32	40	50
D4 _{h7}	63	73	88	108	135	165	205
D5	31	35	43	53	68	83	104
D6	M4	M5	M5	M8	M12	M16	M16
D7	21	22	28	33	47	55	75
D8	53	62	76	95	92	114	142
D9	4xM4xL7	4xM5xL8	4xM5xL8	6xM6xL10	6xM6xL10	6xM8xL12.5	6xM8xL12.5
D10	15.4	20.4	25.8	35.8	49.8	59.3	79.3
D11 _{g6}	62.9	72.9	87	107	103	127	158
D12	62	72	86	106	104	128	160
D13 _{k6}	13	16	18	22	32	40	50
D14 _{h7}	63	73	88	108	135	165	205
D16	M4	M5	M5	M8	M12	M16	M16
L1	65	75	90	110	140	170	210
L2	19.5	30	35	40	50	60	75
L3	13	14.5	15	15	15	15	20
L4	2	2	2	2	2	2	2
L5	16	25	28	32	45	50	70
L6	2	2.5	3.5	4	2.5	5	2.5
L7	47.5	54	62	72	87	102	127
L8	67	84	97	112	137	162	202
L9	4.5	4.8	4.8	7.2	10	12	12
L10	10	12.5	12.5	19	28	36	36
L11	27	30	36	44	55	67	85
L12	19.5	30	35	40	50	60	75
L13	13	15	15	15	15	15	20
L14	2	2	2	2	2	2	2
L15	16	25	28	32	45	50	70
L16	2	2.5	3.5	4	2.5	5	2.5
L17	6	8	8	8	10	10	10
L18	43	52.5	55	60	60	70	90
L19	4.5	4.8	4.8	7.2	10	12	12
L20	10	12.5	12.5	19	28	36	36
L21	75.5	90	100	115	130	155	195
L22	95	120	135	155	180	215	270
B1 _{h9}	5	5	6	6	10	12	14
B2 _{h9}	5	5	6	6	10	12	14
H1	15	18	20.5	24.5	35	43	53.5
H2	15	18	20.5	24.5	35	43	53.5

产品尺寸 / product dimension

FAT-R1, 1 stage

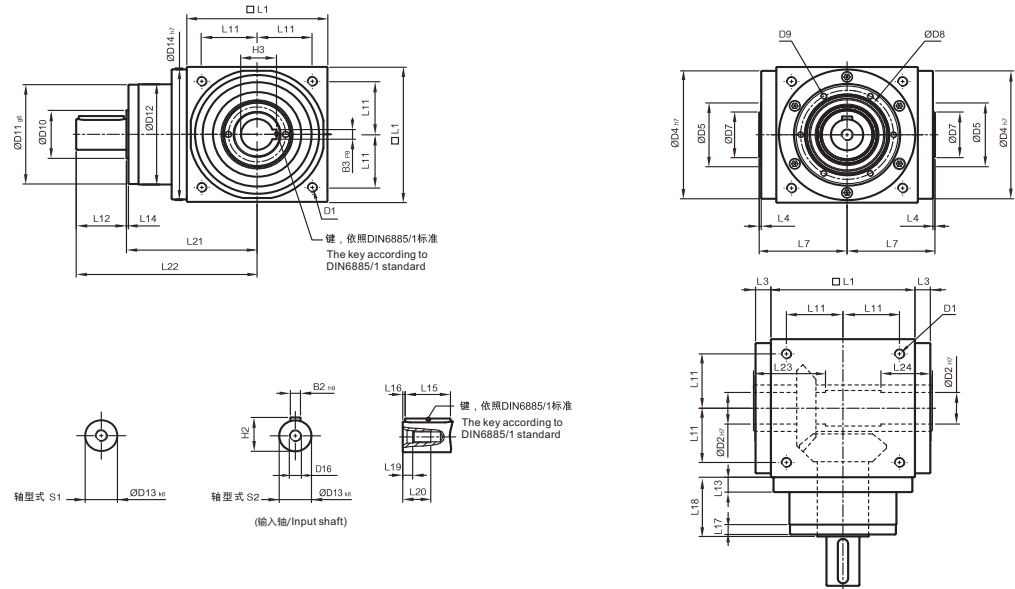


(单位: mm) (Unit:mm)

规格 Model	FAT065 L1/R1	FAT075 L1/R1	FAT090 L1/R1	FAT110 L1/R1	FAT140 L1/R1	FAT170 L1/R1	FAT210 L1/R1
D1	M4	M6	M6	M8	M10	M12	M16
D3 _{k6}	13	16	18	22	32	40	50
D4 _{h7}	63	73	88	108	135	165	205
D5	31	35	43	53	68	83	104
D6	M4	M5	M5	M8	M12	M16	M16
D7	21	22	28	33	47	55	75
D8	53	62	76	95	92	114	142
D9	4xM4xL7	4xM5xL8	4xM5xL8	6xM6xL10	6xM6xL10	6xM8xL12.5	6xM8xL12.5
D10	15.4	20.4	25.8	35.8	49.8	59.3	79.3
D11 _{g6}	62.9	72.9	87	107	103	127	158
D12	62	72	86	106	104	128	160
D13 _{k6}	13	16	18	22	32	40	50
D14 _{h7}	63	73	88	108	135	165	205
D16	M4	M5	M5	M8	M12	M16	M16
L1	65	75	90	110	140	170	210
L2	19.5	30	35	40	50	60	75
L3	13	14.5	15	15	15	15	20
L4	2	2	2	2	2	2	2
L5	16	25	28	32	45	50	70
L6	2	2.5	3.5	4	2.5	5	2.5
L7	47.5	54	62	72	87	102	127
L8	67	84	97	112	137	162	202
L9	4.5	4.8	4.8	7.2	10	12	12
L10	10	12.5	12.5	19	28	36	36
L11	27	30	36	44	55	67	85
L12	19.5	30	35	40	50	60	75
L13	13	15	15	15	15	15	20
L14	2	2	2	2	2	2	2
L15	16	25	28	32	45	50	70
L16	2	2.5	3.5	4	2.5	5	2.5
L17	6	8	8	8	10	10	10
L18	43	52.5	55	60	60	70	90
L19	4.5	4.8	4.8	7.2	10	12	12
L20	10	12.5	12.5	19	28	36	36
L21	75.5	90	100	115	130	155	195
L22	95	120	135	155	180	215	270
B1 _{h9}	5	5	6	6	10	12	14
B2 _{h9}	5	5	6	6	10	12	14
H1	15	18	20.5	24.5	35	43	53.5
H2	15	18	20.5	24.5	35	43	53.5

产品尺寸 / product dimension

FAT-H, 1 stage

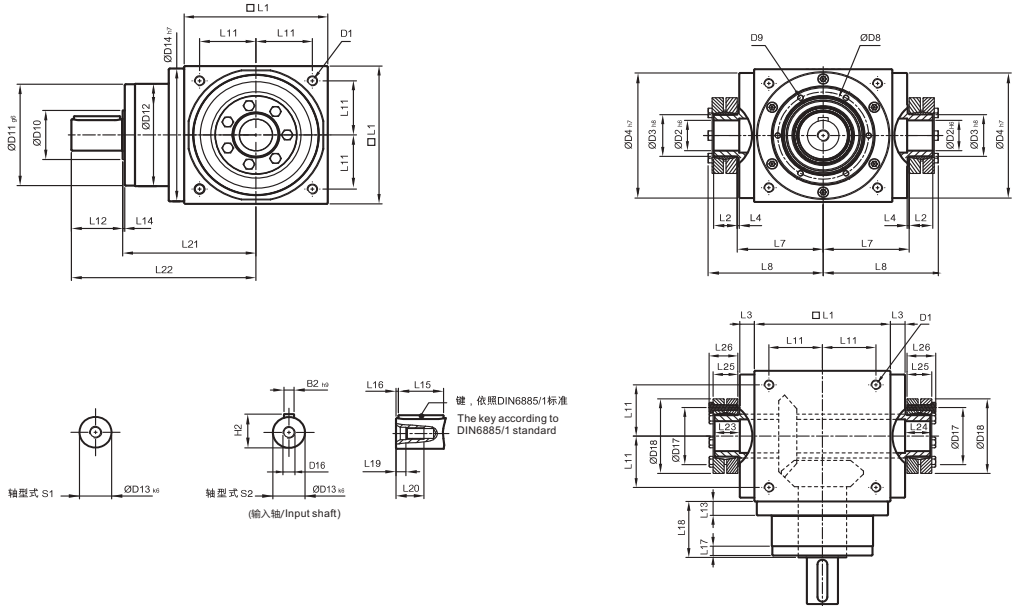


(单位: mm) (Unit:mm)

规格 Model	FAT065H	FAT075H	FAT090H	FAT110H	FAT140H	FAT170H	FAT210H
D1	M4	M6	M6	M8	M10	M12	M16
D2 _{H7}	13	14	18	22	32	40	50
D4 _{H7}	63	73	88	108	135	165	205
D5	31	35	43	53	68	83	104
D7	21	22	28	33	47	55	75
D8	53	62	76	95	92	114	142
D9	4xM4xL7	4xM5xL8	4xM5xL8	6xM6xL10	6xM6xL10	6xM8xL12.5	6xM8xL12.5
D10	15.4	20.4	25.8	35.8	49.8	59.3	79.3
D11 _{g6}	62.9	72.9	87	107	103	127	158
D12	62	72	86	106	104	128	160
D13 _{k6}	13	16	18	22	32	40	50
D14 _{H7}	63	73	88	108	135	165	205
D16	M4	M5	M5	M8	M12	M16	M16
L1	65	75	90	110	140	170	210
L3	13	14.5	15	15	15	15	20
L4	2	2	2	2	2	2	2
L7	47.5	54	62	72	87	102	127
L11	27	30	36	44	55	67	85
L12	19.5	30	35	40	50	60	75
L13	13	15	15	15	15	15	20
L14	2	2	2	2	2	2	2
L15	16	25	28	32	45	50	70
L16	2	2.5	3.5	4	2.5	5	2.5
L17	6	8	8	8	10	10	10
L18	43	52.5	55	60	60	70	90
L19	4.5	4.8	4.8	7.2	10	12	12
L20	10	12.5	12.5	19	28	36	36
L21	75.5	90	100	115	130	155	195
L22	95	120	135	155	180	215	270
L23	40	47	52	53	70	80	95
L24	30	32	35	35	50	55	65
B2 _{H9}	5	5	6	6	10	12	14
B3 _{P9}	5	5	6	6	10	12	14
H2	15	18	20.5	24.5	35	43	53.5
H3	15.3	16.3	20.8	24.8	35.3	43.3	53.8

产品尺寸 / product dimension

FAT-C, 1 stage



(单位: mm) (Unit:mm)

Model	FAT065C	FAT075C	FAT090C	FAT110C	FAT140C	FAT170C	FAT210C
D1	M4	M6	M6	M8	M10	M12	M16
D2 _{H6}	13	14	18	22	32	40	50
D3 _{H8}	16	16	22	25	44	50	62
D4 _{H7}	63	73	88	108	135	165	205
D8	53	62	76	95	92	114	142
D9	4xM4xL7	4xM5xL8	4xM5xL8	6xM6xL10	6xM6xL10	6xM8xL12.5	6xM8xL12.5
D10	15.4	20.4	25.8	35.8	49.8	59.3	79.3
D11 _{g6}	62.9	72.9	87	107	103	127	158
D12	62	72	86	106	104	128	160
D13 _{k6}	13	16	18	22	32	40	50
D14 _{H7}	63	73	88	108	135	165	205
D16	M4	M5	M5	M8	M12	M16	M16
D17	26	26	36	38	61	70	86
D18	41	41	50	50	80	90	110
L1	65	75	90	110	140	170	210
L2	14	14	18	18	24	26	29
L3	13	14.5	15	15	15	15	20
L4	2	2	2	2	2	2	2
L7	47.5	54	62	72	87	102	127
L8	66	72.5	85	95	116.5	133.5	161.5
L11	27	30	36	44	55	67	85
L12	19.5	30	35	40	50	60	75
L13	13	15	15	15	15	15	20
L14	2	2	2	2	2	2	2
L15	16	25	28	32	45	50	70
L16	2	2.5	3.5	4	2.5	5	2.5
L17	6	8	8	8	10	10	10
L18	43	52.5	55	60	60	70	90
L19	4.5	4.8	4.8	7.2	10	12	12
L20	10	12.5	12.5	19	28	36	36
L21	75.5	90	100	115	130	155	195
L22	95	120	135	155	180	215	270
L23	15	15	20	20	26	28	31
L24	15	15	20	20	26	28	31
L25	15	15	19.5	19.5	25.5	27.5	30.5
L26	18.5	18.5	23	23	29.5	31.5	34.5
B2 _{H9}	5	5	6	6	10	12	14
H2	15	18	20.5	24.5	35	43	53.5

技术参数 / technical specification

法兰输入型 Flange input type (单位: mm) (Unit:mm)

规 格 Model		级 数 Stage	减速比 ¹ Ratio	FAT065 FL FAT065 FL1 FAT065 FH FAT065 FC FAT065 FR1	FAT075 FL FAT075 FL1 FAT075 FH FAT075 FC FAT075 FR1	FAT090 FL FAT090 FL1 FAT090 FH FAT090 FC FAT090 FR1	FAT110 FL FAT110 FL1 FAT110 FH FAT110 FC FAT110 FR1	FAT140 FL FAT140 FL1 FAT140 FH FAT140 FC FAT140 FR1	FAT170 FL FAT170 FL1 FAT170 FH FAT170 FC FAT170 FR1	FAT210 FL FAT210 FL1 FAT210 FH FAT210 FC FAT210 FR1
额定输出力矩 T _{2N} Rated output torque	Nm	1	1	25	45	78	150	360	585	1,300
			1.5	25	45	78	150	360	585	1,300
			2	24	42	68	150	330	544	1,220
			3	18	33	54	120	270	450	1,020
		2	4	25	45	78	150	360	585	1,300
			5	25	45	78	150	360	585	1,300
			6	25	45	78	150	360	585	1,300
			7	25	45	78	150	360	585	1,300
			8	24	42	68	150	330	544	1,220
			10	24	42	68	150	330	544	1,220
			15	18	33	54	120	270	450	1,020
			20	24	42	68	150	330	544	1,220
		3	25	25	45	78	150	360	585	1,300
			30	25	45	78	150	360	585	1,300
			35	25	45	78	150	360	585	1,300
			40	25	45	78	150	360	585	1,300
			50	24	42	68	150	330	544	1,220
			75	-	-	-	120	270	450	1,020
			100	-	-	-	150	330	544	1,220
			120	-	-	-	120	270	450	1,020
			150	-	-	-	120	270	450	1,020
			200	-	-	-	150	330	544	1,220
			300	-	-	-	120	270	450	1,020
最大加速力矩 T _{2a} Maximum acceleration moment	Nm	1,2,3	1~300	1.5 倍额定输出力矩 (1.5 times of Nominal Output Torque)						
最大加速输入转速 ¹¹ 13 Maximum acceleration input speed	rpm	1	1~3	7,500	6,500	5,500	4,500	3,500	3,000	2,200
		2	4~20	8,000	8,000	6,000	6,000	6,000	6,000	4,800
		3	25~300	-	-	-	8,000	8,000	6,000	6,000
背 隙 Backlash	arcmin	1	1~3	≤6	≤6	≤6	≤6	≤6	≤6	≤6
		2	4~20	≤10	≤10	≤10	≤10	≤10	≤10	≤10
		3	25~300	-	-	-	≤12	≤12	≤12	≤12
最大输出轴径向力 F _{2rB} Maximum input shaft radial force	N	1,2,3	1~300	900	1,100	1,700	2,700	4,800	6,600	11,500
最大输出轴轴向力 F _{2aB} Maximum input shaft axial force	N	1,2,3	1~300	450	550	850	1,350	2,400	3,300	5,750
使用寿命 Life time	h	1,2,3	1~300	20,000(S5工作制/S5 working mode)						
效率 η Efficiency	%	1	1~3	≥ 95%						
		2,3	4~300	≥ 92%						
使用温度 Operating temperature	°C	1,2,3	1~300	-10°C ~ 90°C						
润滑 lubrication				合成润滑脂 (Synthetic lubrication oils)						
噪音值 (n ₁ =1500rpm,无负载) ⁶ Noise level(n1=1500rpm, no load) ⁶	dB (A)	1,2,3	1~300	≤71	≤72	≤76	≤77	≤78	≤79	≤81

1.上述性能参数,均基于减速器运行在S5工作制下。如在S1工作制下运行,请与三凯联系。
2.:背隙值在2%额定力矩T_{2N}的扭力下所测得。

1. The above performance parameters are based on the gearbox operating at duty type S5 If it operates at duty type S1, please contact SKGR.
2.The above backlash is measured under at 2% rated tbrque T_{2N}

转动惯量 / moment of inertia

法兰输入型 Flange input type (单位: mm) (Unit:mm)

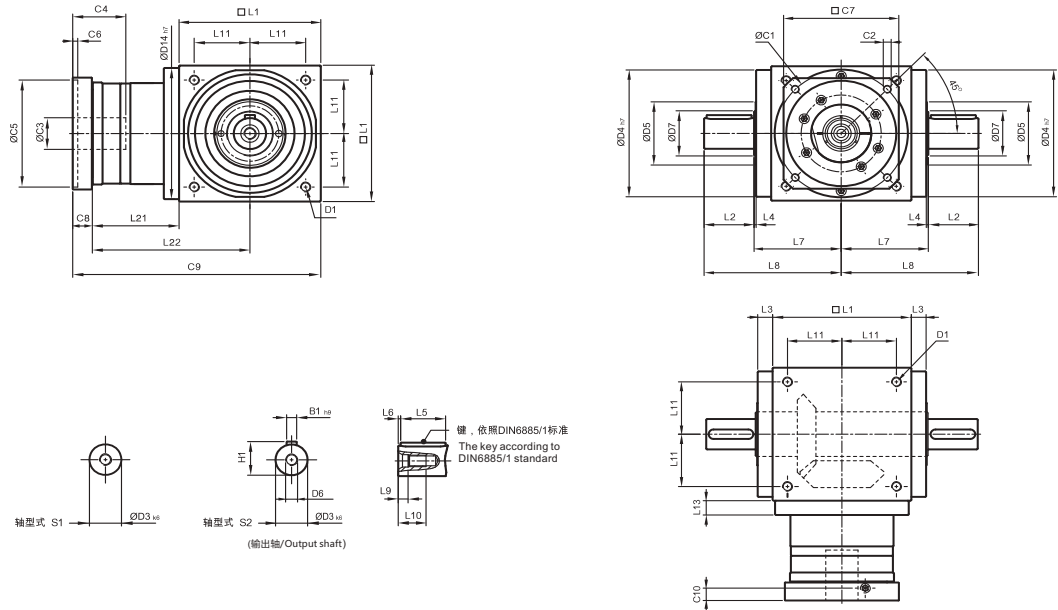
规 格 Model		级 数 Stage	减速比 ¹ Ratio	FAT065 FL FAT065 FL1 FAT065 FH FAT065 FC FAT065 FR1	FAT075 FL FAT075 FL1 FAT075 FH FAT075 FC FAT075 FR1	FAT090 FL FAT090 FL1 FAT090 FH FAT090 FC FAT090 FR1	FAT110 FL FAT110 FL1 FAT110 FH FAT110 FC FAT110 FR1	FAT140 FL FAT140 FL1 FAT140 FH FAT140 FC FAT140 FR1	FAT170 FL FAT170 FL1 FAT170 FH FAT170 FC FAT170 FR1	FAT210 FL FAT210 FL1 FAT210 FH FAT210 FC FAT210 FR1
转动惯量 J ₁ (kg · cm ²) Mass Moments of Inertia J ₁		1	1	0.51	1.30	3.14	7.62	23.54	59.09	195.96
			1.5	0.46	1.15	2.80	6.65	19.34	49.38	156.02
			2	0.44	1.10	2.68	6.23	17.72	45.44	140.80
			3	0.43	1.09	2.64	6.08	17.16	44.11	135.51
		2	4	0.43	1.08	2.63	6.05	17.03	43.79	134.14
			5	0.43	1.08	2.63	6.04	16.99	43.69	133.71
			6	0.15	0.15	0.50	2.79	2.79	2.79	9.91
			7	0.15	0.15	0.50	2.79	2.79	2.79	9.91
			8	0.15	0.15	0.50	2.80	2.80	2.80	9.96
			10	0.15	0.15	0.50	2.80	2.80	2.80	9.96
			15	0.15	0.15	0.50	2.80	2.80	2.80	9.96
			20	0.15	0.15	0.50	2.80	2.80	2.80	9.96
		3	25	0.15	0.15	0.50	2.80	2.80	2.80	9.96
			30	0.15	0.15	0.50	2.80	2.80	2.80	9.96
			35	0.15	0.15	0.50	2.79	2.79	2.79	9.91
			40	0.15	0.15	0.50	2.79	2.79	2.79	9.91
			50	0.15	0.15	0.50	2.79	2.79	2.79	9.89
			75	-	-	-	0.15	0.15	0.50	0.50
			100	-	-	-	0.15	0.15	0.50	0.50
			120	-	-	-	0.15	0.15	0.50	0.50
			150	-	-	-	0.15	0.15	0.50	0.50
			200	-	-	-	0.15	0.15	0.50	0.50
			300	-	-	-	0.15	0.15	0.50	0.50

重量 Weight (单位: mm) (Unit:mm)

规 格 Model		级 数 Stage	减速比 ¹ Ratio	PT065	PT075	PT090	PT110	PT140	PT170	PT210
FL 系列 (Series)	kg	1	1~3	2.8	4.4	7.1	12.1	20.9	36.1	69.4
		2	4~20	3.2	4.8	8.1	14.3	24.2	38.5	74.1
		3	25~300	-	-	-	13.9	23.7	38.8	73.4
FL1系列 (Series)		1	1~3	2.7	4.3	7.1	11.9	20.3	35.5	68.3
		2	4~20	3.2	4.8	8.0	14.2	23.9	37.9	73.0
		3	25~300	-	-	-	13.8	23.4	38.2	72.3
FH 系列 (Series)		1	1~3	2.6	4.1	6.7	11.4	18.9	32.9	63.2
		2	4~20	3.1	4.6	7.7	13.6	22.4	35.3	67.9
		3	25~300	-	-	-	13.3	21.9	35.6	67.2
FC 系列 (Series)		1	1~3	2.9	4.4	7.2	11.8	20.4	35.0	66.5
		2	4~20	3.3	4.9	8.2	14.1	24.1	37.4	71.2
		3	25~300	-	-	-	13.7	23.5	37.5	70.5
FR1 系列 (Series)		1	1~3	2.7	4.3	7.1	11.9	20.3	35.5	68.3
		2	4~20	3.2	4.8	8.0	14.2	23.9	37.9	73.0
		3	25~300	-	-	-	13.8	23.4	38.2	72.3

产品尺寸 / product dimension

FAT-FL, 1 stage



(单位: mm) (Unit:mm)

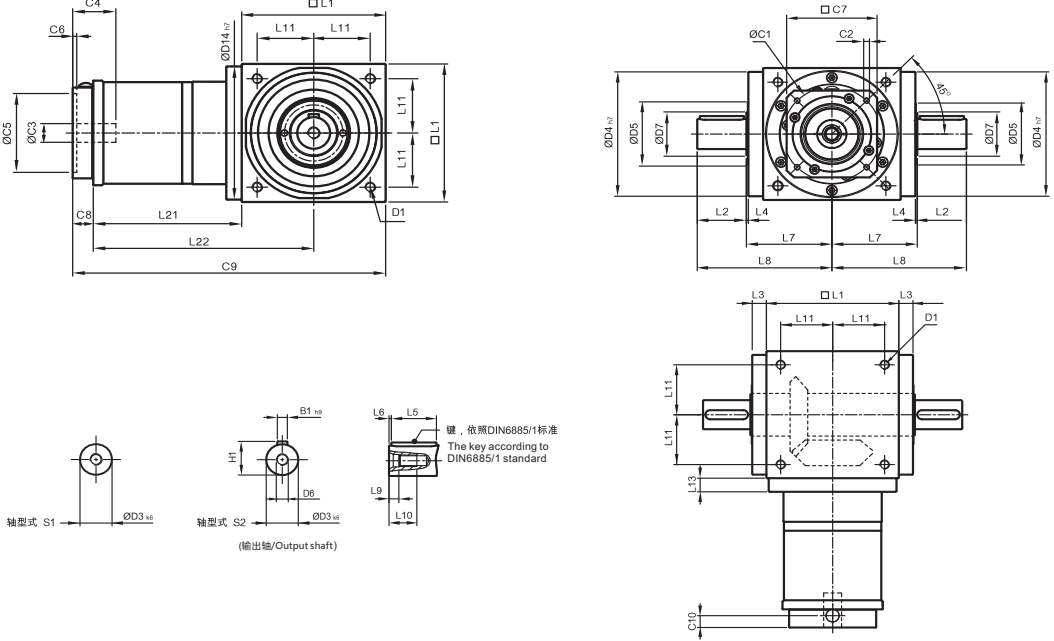
规格Model	FAT065 FL	FAT075 FL	FAT090 FL	FAT110 FL	FAT140 FL	FAT170 FL	FAT210 FL
D1	M4	M6	M6	M8	M10	M12	M16
D3 k6	13	16	18	22	32	40	50
D4 h7	63	73	88	108	135	165	205
D5	31	35	43	53	68	83	104
D6	M4	M5	M5	M8	M12	M16	M16
D7	21	22	28	33	47	55	75
D14 h7	63	73	88	108	135	165	205
L1	65	75	90	110	140	170	210
L2	19.5	30	35	40	50	60	75
L3	13	14.5	15	15	15	15	20
L4	2	2	2	2	2	2	2
L5	16	25	28	32	45	50	70
L6	2	2.5	3.5	4	2.5	5	2.5
L7	47.5	54	62	72	87	102	127
L8	67	84	97	112	137	162	202
L9	4.5	4.8	4.8	7.2	10	12	12
L10	10	12.5	12.5	19	28	36	36
L11	27	30	36	44	55	67	85
L13	13	15	15	15	15	15	20
L21	49	60.5	63	69.5	85.5	95	130
L22	81.5	98	108	124.5	155.5	180	235
C1 ¹	46	70	100	100	130	165	215
C2 ¹	M4	M5	M6	M6	M8	M10	M12
C3 ¹	≤11 / ≤12 ²	≤14 / ≤15.875 / ≤16 ²	≤19	≤24	≤32	≤42	≤52
C4 ¹	30	34	40	40	50	60	85
C5 ¹	30	50	80	80	110	130	180
C6 ¹	3.5	8	4	4	5	6	6
C7 ¹	42	60	90	90	115	142	190
C8 ¹	19.5	19	17	17	19.5	22.5	29
C9 ¹	133.5	154.5	170	196.5	245	287.5	369
C10 ¹	13.25	13.5	10.75	10.75	13	15	20.75
B1 h9	5	5	6	6	10	12	14
H1	15	18	20.5	24.5	35	43	53.5

减速器的部分尺寸参考了ISO9409的标准。
如需更详细的资料，或设计特殊的尺寸请与三凯联系。

Some dimensions of gearbox refer to ISO9409 standard.
For more detailed information, or special sizes, please:contact SKGR.

产品尺寸 / product dimension

FAT-FL, 2 stages



(单位: mm) (Unit:mm)

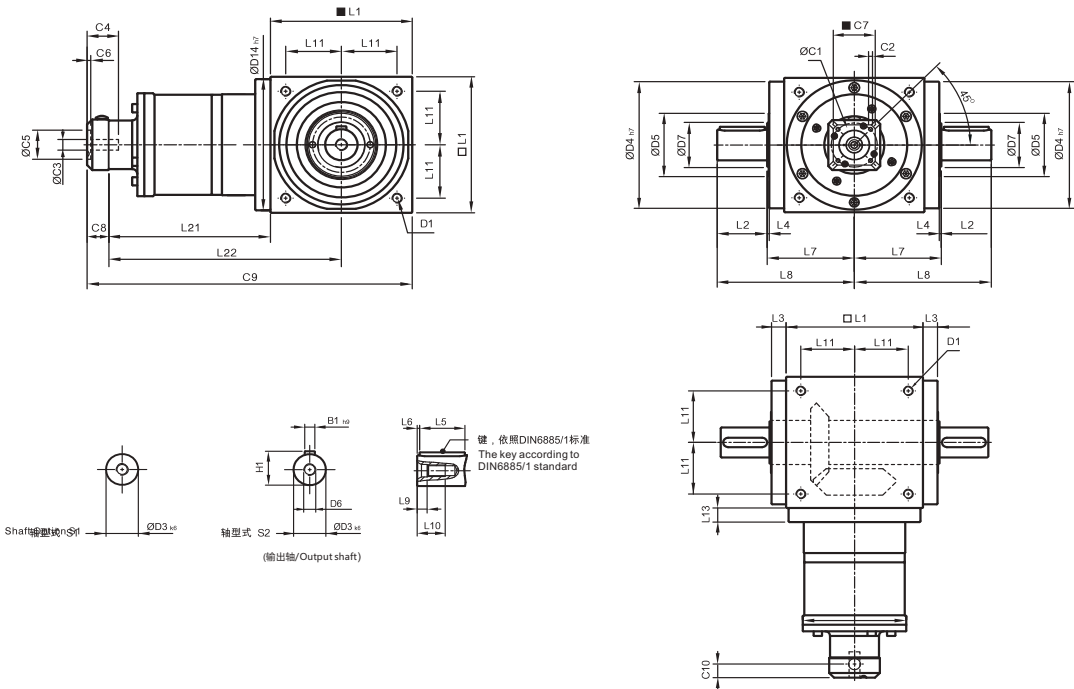
规格Model	PT065 FL	PT075 FL	PT090 FL	PT110 FL	PT140 FL	PT170 FL	PT210 FL
D1	M4	M6	M6	M8	M10	M12	M16
D3 k6	13	16	18	22	32	40	50
D4 h7	63	73	88	108	135	165	205
D5	31	35	43	53	68	83	104
D6	M4	M5	M5	M8	M12	M16	M16
D7	21	22	28	33	47	55	75
D14 h7	63	73	88	108	135	165	205
L1	65	75	90	110	140	170	210
L2	19.5	30	35	40	50	60	75
L3	13	14.5	15	15	15	15	20
L4	2	2	2	2	2	2	2
L5	16	25	28	32	45	50	70
L6	2	2.5	3.5	4	2.5	5	2.5
L7	47.5	54	62	72	87	102	127
L8	67	84	97	112	137	162	202
L9	4.5	4.8	4.8	7.2	10	12	12
L10	10	12.5	12.5	19	28	36	36
L11	27	30	36	44	55	67	85
L13	13	15	15	15	15	15	20
L21	75	84.5	99	122	144.5	157.5	206.5
L22	107.5	122	144	177	214.5	242.5	311.5
C1	46	46	70	100	100	100	130
C2	M4	M4	M5	M6	M6	M6	M8
C3	≤12	≤12	≤16	≤24	≤24	≤24	≤32
C4	30	30	34	40	40	40	50
C5	30	30	50	80	80	80	110
C6	3.5	3.5	8	4	4	4	5
C7	42	42	60	92	92	92	115
C8	21.5	21.5	21.5	20	20	20	24
C9	161.5	181	210.5	252	304.5	347.5	440.5
C10	14.5	14.5	15.5	13	13	13	16
B1 h9	5	5	6	6	10	12	14
H1	15	18	20.5	24.5	35	43	53.5

减速器的部分尺寸参考了ISO9409的标准。
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产品尺寸 / product dimension

FAT-FL, 3stages



(单位: mm) (Unit:mm)

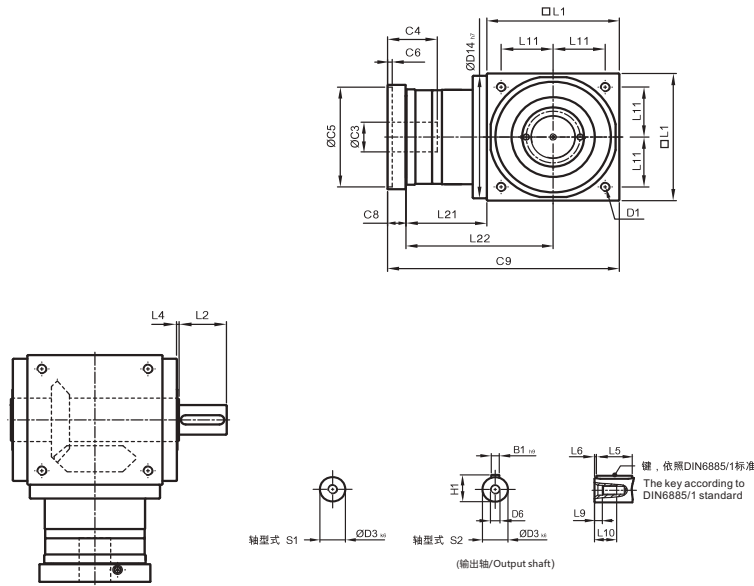
规格Model	FAT110 FL	FAT140 FL	FAT170 FL	FAT210 FL
D1	M8	M10	M12	M16
D3 k6	22	32	40	50
D4 h7	108	135	165	205
D5	53	68	83	104
D6	M8	M12	M16	M16
D7	33	47	55	75
D14 h7	108	135	165	205
L1	110	140	170	210
L2	40	50	60	75
L3	15	15	15	20
L4	2	2	2	2
L5	32	45	50	70
L6	4	2.5	5	2.5
L7	72	87	102	127
L8	112	137	162	202
L9	7.2	10	12	12
L10	19	28	36	36
L11	44	55	67	85
L13	15	15	15	20
L21	136.5	159.5	183.5	226
L22	191.5	229.5	268.5	331
C1	46	46	70	70
C2	M4	M4	M5	M5
C3	≤12	≤12	≤16	≤16
C4	30	30	34	34
C5	30	30	50	50
C6	3.5	3.5	8	8
C7	42	42	60	60
C8	21.5	21.5	21.5	21.5
C9	268	321	375	457.5
C10	14.5	14.5	15.5	15.5
B1 h9	6	10	12	14
H1	24.5	35	43	53.5

减速器的部分尺寸参考了ISO9409的标准。
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For more detailed information, or special sizes, please:contact SKGR.

产品尺寸 / product dimension

FAT-FR1, 1 stage



(单位: mm) (Unit:mm)

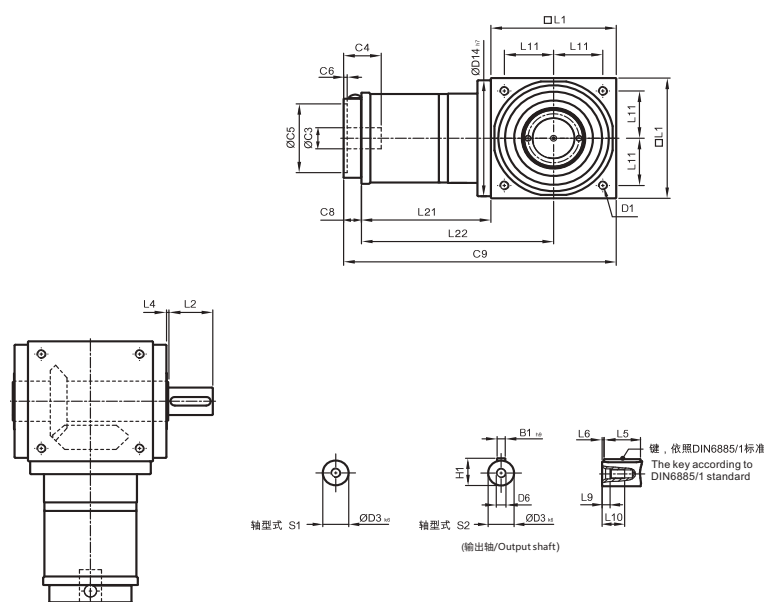
规格Model	FAT065 FL1/FR1	FAT075 FL1/FR1	FAT090 FL1/FR1	FAT110 FL1/FR1	FAT140 FL1/FR1	FAT170 FL1/FR1	FAT210 FL1/FR1
D1	M4	M6	M6	M8	M10	M12	M16
D3 k6	13	16	18	22	32	40	50
D4 h7	63	73	88	108	135	165	205
D5	31	35	43	53	68	83	104
D6	M4	M5	M5	M8	M12	M16	M16
D7	21	22	28	33	47	55	75
D14 h7	63	73	88	108	135	165	205
L1	65	75	90	110	140	170	210
L2	19.5	30	35	40	50	60	75
L3	13	14.5	15	15	15	15	20
L4	2	2	2	2	2	2	2
L5	16	25	28	45	45	50	70
L6	2	2.5	3.5	4	2.5	5	2.5
L7	47.5	54	62	72	87	102	127
L8	67	84	97	112	137	162	202
L9	4.5	4.8	4.8	7.2	10	12	12
L10	10	12.5	12.5	19	28	36	36
L11	27	30	36	44	55	67	85
L13	13	15	15	15	15	15	20
L21	49	60.5	63	69.5	85.5	95	130
L22	81.5	98	108	124.5	155.5	180	235
C1	46	70	100	100	130	165	215
C2	M4	M5	M6	M6	M8	M10	M12
C3	≤11/≤12	≤14/≤15.875/≤16	≤19	≤24	≤32	≤38	≤42
C4	30	34	40	40	50	60	85
C5	30	50	80	80	110	130	180
C6	3.5	8	4	4	5	6	6
C7	42	60	90	90	115	142	190
C8	19.5	19	17	17	19.5	22.5	29
C9	133.5	154.5	170	196.5	245	287.5	369
C10	13.25	13.5	10.75	10.75	13	15	20.75
B1 h9	5	5	6	6	10	12	14
H1	15	18	20.5	24.5	35	43	53.5

减速器的部分尺寸参考了ISO9409的标准。
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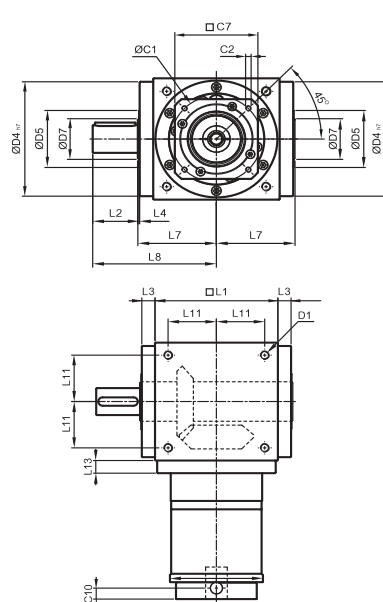
Some dimensions of gearbox refer to ISO9409 standard.
For more detailed information, or special sizes, please:contact SKGR.

产品尺寸 / product dimension

FAT-FR1, 2stages



FAT-FL1, 2stages



(单位: mm) (Unit:mm)

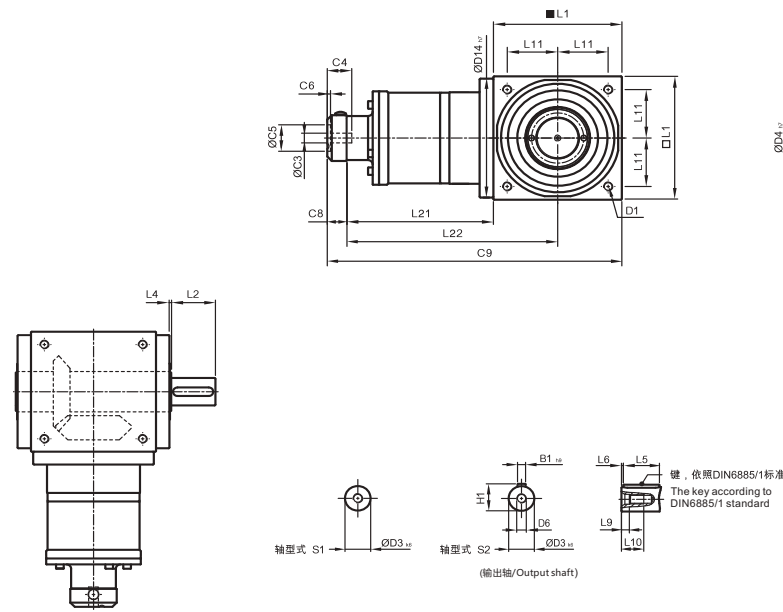
规格Model	FAT065 FL1/FR1	FAT075 FL1/FR1	FAT090 FL1/FR1	FAT110 FL1/FR1	FAT140 FL1/FR1	FAT170 FL1/FR1	FAT210 FL1/FR1
D1	M4	M6	M6	M8	M10	M12	M16
D3 k6	13	16	18	22	32	40	50
D4 h7	63	73	88	108	135	165	205
D5	31	35	43	53	68	83	104
D6	M4	M5	M5	M8	M12	M16	M16
D7	21	22	28	33	47	55	75
D14 h7	63	73	88	108	135	165	205
L1	65	75	90	110	140	170	210
L2	19.5	30	35	40	50	60	75
L3	13	14.5	15	15	15	15	20
L4	2	2	2	2	2	2	2
L5	16	25	28	32	45	50	70
L6	2	2.5	3.5	4	2.5	5	2.5
L7	47.5	54	62	72	87	102	127
L8	67	84	97	112	137	162	202
L9	4.5	4.8	4.8	7.2	10	12	12
L10	10	12.5	12.5	19	28	36	36
L11	27	30	36	44	55	67	85
L13	13	15	15	15	15	15	20
L21	75	84.5	99	122	144.5	157.5	206.5
L22	107.5	122	144	177	214.5	242.5	311.5
C1	46	46	70	100	100	100	130
C2	M4	M4	M5	M6	M6	M6	M8
C3	≤12	≤12	≤16	≤24	≤24	≤24	≤32
C4	30	30	34	40	40	40	50
C5	30	30	50	80	80	80	110
C6	3.5	3.5	8	4	4	4	5
C7	42	42	60	92	92	92	115
C8	21.5	21.5	21.5	20	20	20	24
C9	161.5	181	210.5	252	304.5	347.5	440.5
C10	14.55	14.5	15.5	13	13	13	16
B1 h9	5	5	6	6	10	12	14
H1	15	18	20.5	24.5	35	43	53.5

减速器的部分尺寸参考了ISO9409的标准。
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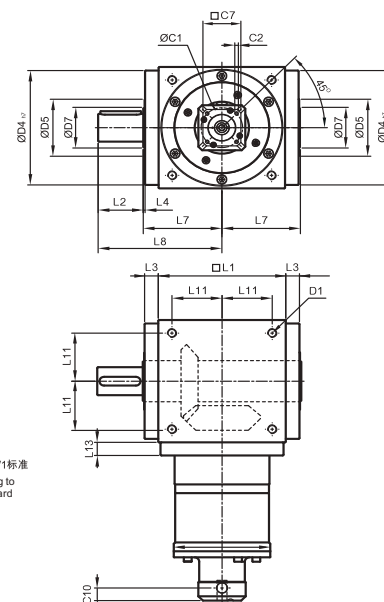
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产品尺寸 / product dimension

FAT-FR1, 3stages



FAT-FL1, 3 stages



(单位: mm) (Unit:mm)

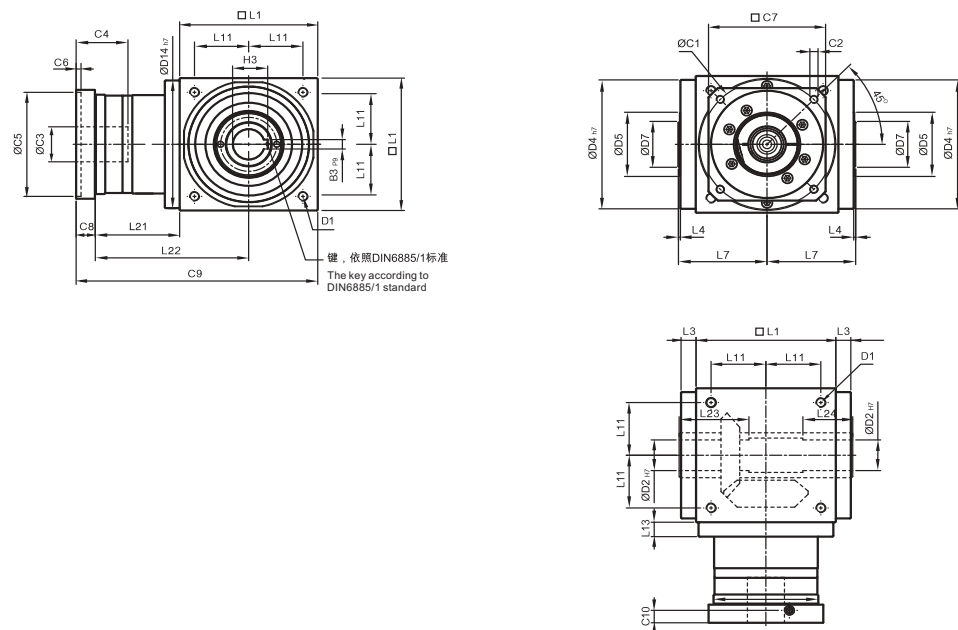
规格Model	FAT110 FL1/FR1	FAT140 FL1/FR1	FAT170 FL1/FR1	FAT210 FL1/FR1
D1	M8	M10	M12	M16
D3 _{k6}	22	32	40	50
D4 _{h7}	108	135	165	205
D5	53	68	83	104
D6	M8	M12	M16	M16
D7	33	47	55	75
D14 _{h7}	108	135	165	205
L1	110	140	170	210
L2	40	50	60	75
L3	15	15	15	20
L4	2	2	2	2
L5	32	45	50	70
L6	4	2.5	5	2.5
L7	72	87	102	127
L8	112	137	162	202
L9	7.2	10	12	12
L10	19	28	36	36
L11	44	55	67	85
L13	15	15	15	20
L21	136.5	159.5	183.5	226
L22	191.5	229.5	268.5	331
C1	46	46	70	70
C2	M4	M4	M5	M5
C3	≤12	≤12	≤16	≤16
C4	30	30	34	34
C5	30	30	50	50
C6	3.5	3.5	8	8
C7	42	42	60	60
C8	21.5	21.5	21.5	21.5
C9	268	321	375	457.5
C10	14.5	14.5	15.5	15.5
B1 _{h9}	6	10	12	14
H1	24.5	35	43	53.5

减速器的部分尺寸参考了ISO9409的标准。
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产品尺寸 / product dimension

FAT-FH, 1 stage



(单位: mm) (Unit:mm)

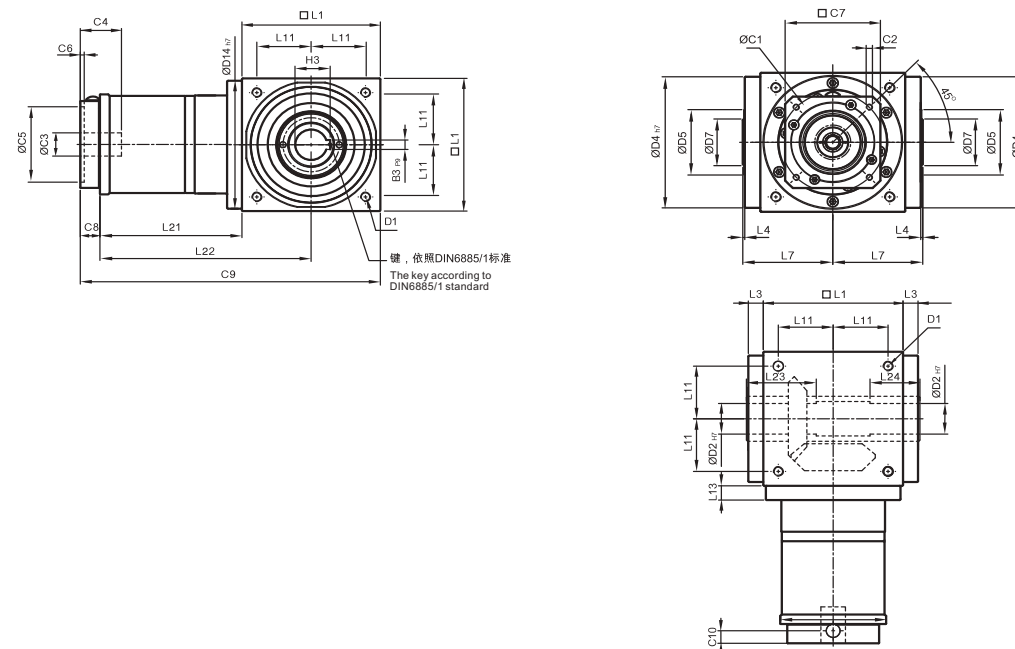
规格Model	FAT065 FH	FAT075 FH	FAT090 FH	FAT110 FH	FAT140 FH	FAT170 FH	FAT210 FH
D1	M4	M6	M6	M8	M10	M12	M16
D2 _{H7}	13	14	18	22	32	40	50
D4 _{H7}	63	73	88	108	135	165	205
D5	31	35	43	53	68	83	104
D7	21	22	28	33	47	55	75
D14 _{H7}	63	73	88	108	135	165	205
L1	65	75	90	110	140	170	210
L3	13	14.5	15	15	15	15	20
L4	2	2	2	2	2	2	2
L7	47.5	54	62	72	87	102	127
L11	27	30	36	44	55	67	85
L13	13	15	15	15	15	15	20
L21	49	60.5	63	69.5	85.5	95	130
L22	81.5	98	108	124.5	155.5	180	235
L23	40	47	52	53	70	80	95
L24	30	32	35	35	50	55	65
C1	46	70	100	100	130	165	215
C2	M4	M5	M6	M6	M8	M10	M12
C3	≤11/≤12	≤114/≤15.875/≤16	≤19	≤24	≤32	≤38	≤42
C4	30	34	40	40	50	60	85
C5	30	50	80	80	110	130	180
C6	3.5	8	4	4	5	6	6
C7	42	60	90	90	115	142	190
C8	19.5	19	17	17	19.5	22.5	29
C9	133.5	154.5	170	196.5	245	287.5	369
C10	13.25	13.5	10.75	10.75	13	15	20.75
B3 _{P9}	5	5	6	6	10	12	14
H3	15.3	16.3	20.8	24.8	35.3	43.3	53.8

减速器的部分尺寸参考了ISO9409的标准。
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产品尺寸 / product dimension

FAT-FH, 2 stages



(单位: mm) (Unit:mm)

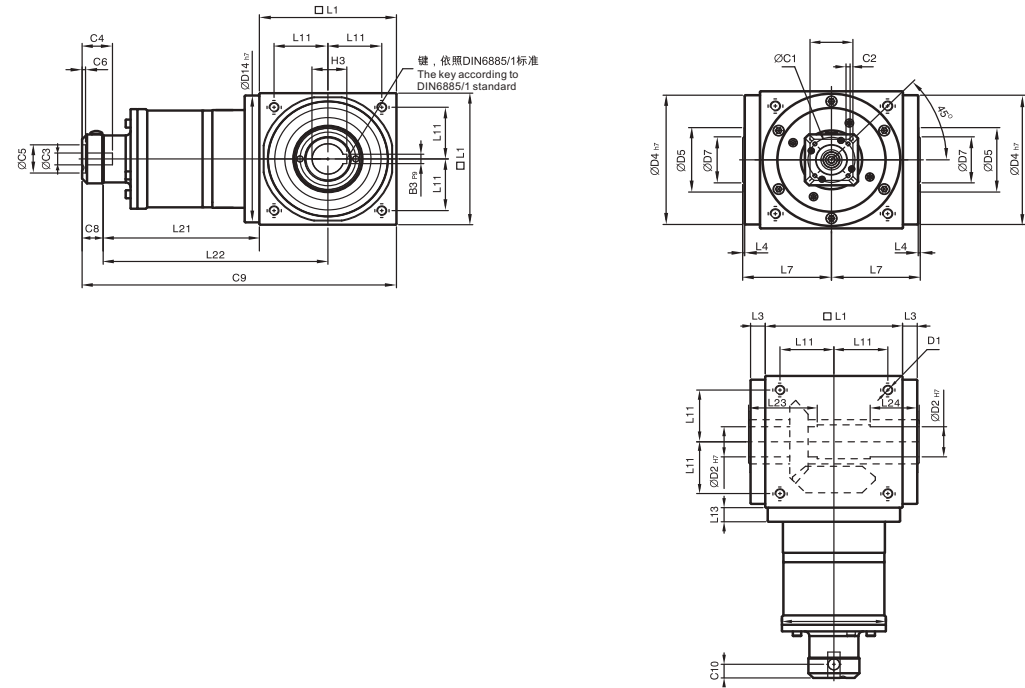
规格Model	FAT065 FH	FAT075 FH	FAT090 FH	FAT110 FH	FAT140 FH	FAT170 FH	FAT210 FH
D1	M4	M6	M6	M8	M10	M12	M16
D2 _{H7}	13	14	18	22	32	40	50
D4 _{h7}	63	73	88	108	135	165	205
D5	31	35	43	53	68	83	104
D7	21	22	28	33	47	55	75
D14 _{h7}	63	73	88	108	135	165	205
L1	65	75	90	110	140	170	210
L3	13	14.5	15	15	15	15	20
L4	2	2	2	2	2	2	2
L7	47.5	54	62	72	87	102	127
L11	27	30	36	44	55	67	85
L13	13	15	15	15	15	15	20
L21	75	84.5	99	122	144.5	157.5	206.5
L22	107.5	122	144	177	214.5	242.5	311.5
L23	40	47	52	53	70	80	95
L24	30	32	35	35	50	55	65
C1	46	46	70	100	100	100	130
C2	M4	M4	M5	M6	M6	M6	M8
C3	≤12	≤12	≤16	≤24	≤24	≤24	≤32
C4	30	30	34	40	40	40	50
C5	30	30	50	80	80	80	110
C6	3.5	3.5	8	4	4	4	5
C7	42	42	60	92	92	92	115
C8	21.5	21.5	21.5	20	20	20	24
C9	161.5	181	210.5	252	304.5	347.5	440.5
C10	14.5	14.5	15.5	13	13	13	16
B3 _{P9}	5	5	6	6	10	12	14
H3	15.3	16.3	20.8	24.8	35.3	43.3	53.8

减速器的部分尺寸参考了ISO9409的标准。
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产品尺寸 / product dimension

FAT-FH, 3stages



(单位: mm) (Unit:mm)

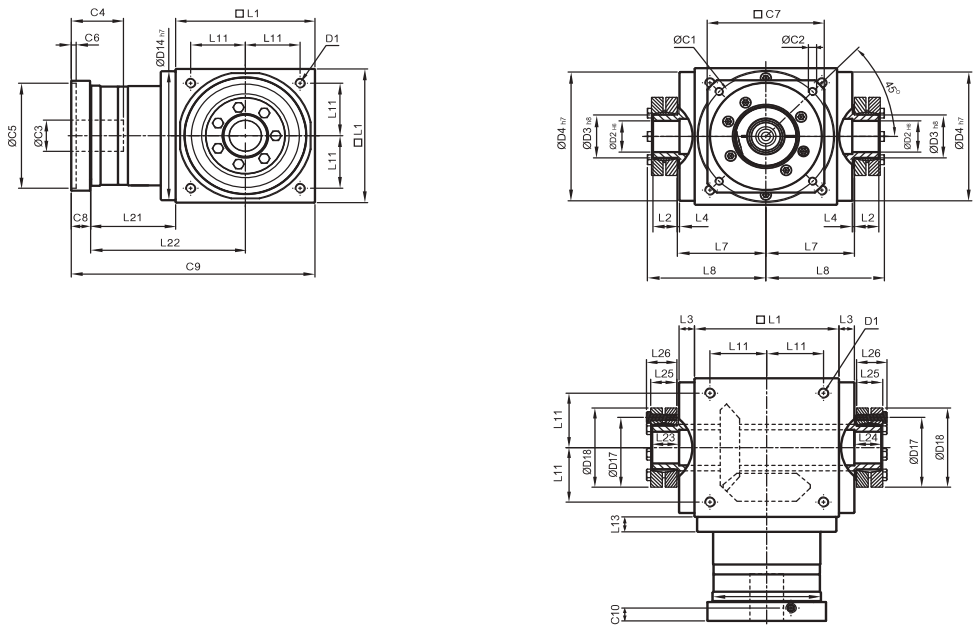
规格Model	FAT110 FH	FAT140 FH	FAT170 FH	FAT210 FH
D1	M8	M10	M12	M16
D2 _{H7}	22	32	40	50
D4 _{H7}	108	135	165	205
D5	53	68	83	104
D7	33	47	55	75
D14 _{H7}	108	135	165	205
L1	110	140	170	210
L3	15	15	15	20
L4	2	2	2	2
L7	72	87	102	127
L11	44	55	67	85
L13	15	15	15	20
L21	136.5	159.5	183.5	226
L22	191.5	229.5	268.5	331
L23	53	70	80	95
L24	35	50	55	65
C1	46	46	70	70
C2	M4	M4	M5	M5
C3	≤12	≤12	≤16	≤16
C4	30	30	34	34
C5	30	30	50	50
C6	3.5	3.5	8	8
C7	42	42	60	60
C8	21.5	21.5	21.5	21.5
C9	268	321	375	457.5
C10	14.5	14.5	15.5	15.5
B3 _{P9}	6	10	12	14
H3	24.8	35.3	43.3	53.8

减速器的部分尺寸参考了ISO9409的标准。
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产品尺寸 / product dimension

FAT-FC, 1 stage



(单位: mm) (Unit:mm)

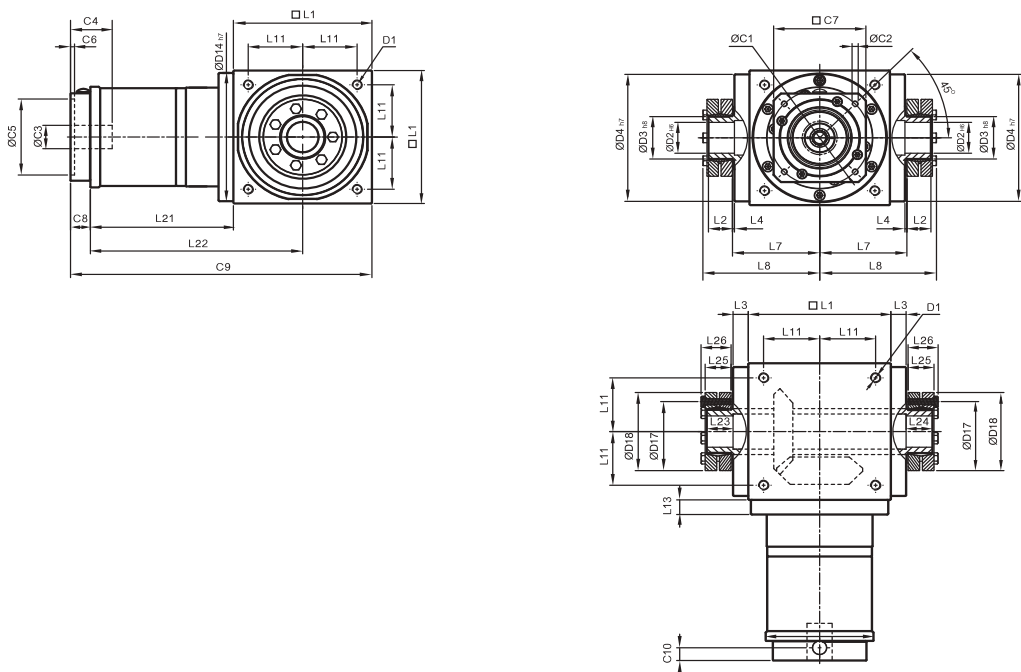
规格Model	FAT065 FC	FAT075 FC	FAT090 FC	FAT110 FC	FAT140 FC	FAT170 FC	FAT210 FC
D1	M4	M6	M6	M8	M10	M12	M16
D2 _{H6}	13	14	18	22	32	40	50
D3 _{H8}	16	16	22	25	44	50	62
D4 _{H7}	63	73	88	108	135	165	205
D14 _{H7}	63	73	88	108	135	165	205
D17	26	26	36	38	61	70	86
D18	41	41	50	50	80	90	110
L1	65	75	90	110	140	170	210
L2	14	14	18	18	24	26	29
L3	13	14.5	15	15	15	15	20
L4	2	2	2	2	2	2	2
L7	47.5	54	62	72	87	102	127
L8	66	72.5	85	95	116.5	133.5	161.5
L11	27	30	36	44	55	67	85
L13	13	15	15	15	15	15	20
L21	49	60.5	63	69.5	85.5	95	130
L22	81.5	98	108	124.5	155.5	180	235
L23	15	15	20	20	26	28	31
L24	15	15	20	20	26	28	31
L25	15	15	19.5	19.5	25.5	27.5	30.5
L26	18.5	18.5	23	23	29.5	31.5	34.5
C1	46	70	100	100	130	165	215
C2	M4	M5	M6	M6	M8	M10	M12
C3	≤11/ ≤12	≤14/ ≤15.875/ ≤16	≤19	≤24	≤32	≤38	≤42
C4	30	34	40	40	50	60	85
C5	30	50	80	80	110	130	180
C6	3.5	8	4	4	5	6	6
C7	42	60	90	90	115	142	190
C8	19.5	19	17	17	19.5	22.5	29
C9	133.5	154.5	170	196.5	245	287.5	369
C10	13.25	13.5	10.75	10.75	13	15	20.75

减速器的部分尺寸参考了ISO9409的标准。
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产品尺寸 / product dimension

FAT-FC, 2 stages



(単位: mm) (Unit:mm)

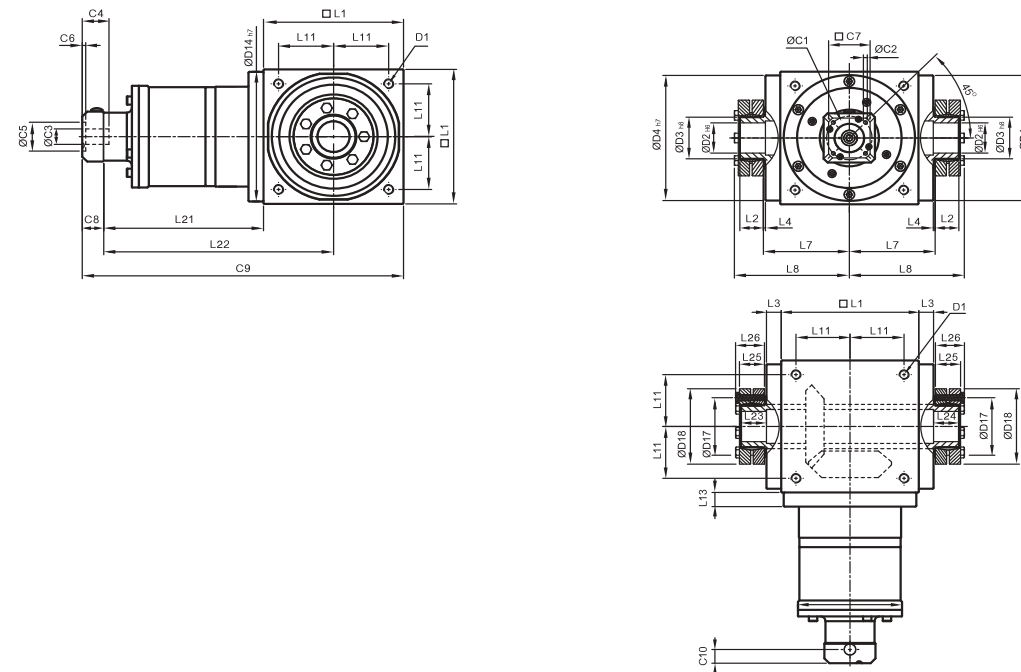
规格Model	FAT065-FC	FAT075-FC	FAT090-FC	FAT110-FC	FAT140-FC	FAT170-FC	FAT210-FC
D1	M4	M6	M6	M8	M10	M12	M16
D2 _{H6}	13	14	18	22	32	40	50
D3 _{h8}	16	16	22	25	44	50	62
D4 _{h7}	63	73	88	108	135	165	205
D14 _{h7}	63	73	88	108	135	165	205
D17	26	26	36	38	61	70	86
D18	41	41	50	50	80	90	110
L1	65	75	90	110	140	170	210
L2	14	14	18	18	24	26	29
L3	13	14.5	15	15	15	15	20
L4	2	2	2	2	2	2	2
L7	47.5	54	62	72	87	102	127
L8	66	72.5	85	95	116.5	133.5	161.5
L11	27	30	36	44	55	67	85
L13	13	15	15	15	15	15	20
L21	75	84.5	99	122	144.5	157.5	206.5
L22	107.5	122	144	177	214.5	242.5	311.5
L23	15	15	20	20	26	28	31
L24	15	15	20	20	26	28	31
L25	15	15	19.5	19.5	25.5	27.5	30.5
L26	18.5	18.5	23	23	29.5	31.5	34.5
C1	46	46	70	100	100	100	130
C2	M4	M4	M5	M6	M6	M6	M8
C3	≤12	≤12	≤16	≤24	≤24	≤24	≤32
C4	30	30	34	40	40	40	50
C5	30	30	50	80	80	80	110
C6	3.5	3.5	8	4	4	4	5
C7	42	42	60	92	92	92	115
C8	21.5	21.5	21.5	20	20	20	24
C9	161.5	181	210.5	252	304.5	347.5	440.5
C10	14.5	14.5	15.5	13	13	13	16

减速器的部分尺寸参考了ISO9409的标准。
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产品尺寸 / product dimension

FAT-FC, 3 stages



(单位: mm) (Unit:mm)

规格Model	FAT110-FC	FAT140-FC	FAT170-FC	FAT210-FC
D1	M8	M10	M12	M16
D2 _{H6}	22	32	40	50
D3 _{H8}	25	44	50	62
D4 _{H7}	108	135	165	205
D14 _{H7}	108	135	165	205
D17	38	61	70	86
D18	50	80	90	110
L1	110	140	170	210
L2	18	24	26	29
L3	15	15	15	20
L4	2	2	2	2
L7	72	87	102	127
L8	95	116.5	133.5	161.5
L11	44	55	67	85
L13	15	15	15	20
L21	136.5	159.5	183.5	226
L22	191.5	229.5	268.5	331
L23	20	26	28	31
L24	20	26	28	31
L25	19.5	25.5	27.5	30.5
L26	23	29.5	31.5	34.5
C1	46	46	70	70
C2	M4	M4	M5	M5
C3	≤12	≤12	≤16	≤16
C4	30	30	34	34
C5	30	30	50	50
C6	3.5	3.5	8	8
C7	42	42	60	60
C8	21.5	21.5	21.5	21.5
C9	268	321	375	457.5
C10	14.5	14.5	15.5	15.5

减速器的部分尺寸参考了ISO9409的标准。
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安装说明 / INSTALLATION INSTRUCTION

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

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

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

减速机型号 Reducer model				马达轴径 Motor shaft diameter	螺丝尺寸 Screw Size	六角头尺寸 Hexagon head size	锁紧扭力 Locking torque	
				[mm]	[mm]	[mm]	[Nm]	[In-lbs]
FAB042 FABR042 FAD047 FADR047 FG040 FGA040 FB042 FBR042	单级 Single stage			≤12	M3x0.5Px10L	2.5	2.1	19
	双级 Dual stages			≤12	M3x0.5Px10L	2.5	2.1	19
FAB060 FABR060 FAD064 FADR064 FB060 FBR060 FE070 FER070 FG060 FGA060 FGR060 FGAR060 FAF060 FAFR060	单级 Single stage			≤19	M5x0.8Px14L	4	9.8	87
	双级 Dual stages			≤19	M5x0.8Px14L	4	9.8	87
FAB090 FABR090 FAD090 FADR090 FB090 FBR090 FE090 FER090 FG080 FGA080 FGR080 FGAR080 FAF070 FAFR070	单级 Single stage			≤24	M6x1Px20L	5	17	151
	双级 Dual stages			≤19	M5x0.8Px14L	4	9.8	87
FAB115 FABR115 FAD110 FADR110 FB115 FBR115 FE120 FER120 FG120 FGR120 FGA120 FGAR120 FAF100 FAFR100	单级 Single stage			≤35	M8x1.25Px25L	6	41	364
	双级 Dual stages			≤24	M6x1Px20L	5	17	151
FAB142 FABR142 FAD140 FADR140 FB142 FBR142 FE155 FER155 FG160 FGR160 FGA160 FGAR160 FAF140 FAFR140	单级 Single stage			≤38	M10x1.5Px30L	8	80	709
	双级 Dual stages			≤35	M8x1.25Px25L	6	41	364
FAB180 FABR180 FAD200 FADR200 FB180 FE205 FBR180 FER205 FAF180 FAFR180	单级 Single stage			≤50	M12x1.75Px35L	10	139	1232
	双级 Dual stages			≤38	M10x1.5Px30L	8	80	709
FAB220 FABR220 FAD255 FADR255 FE235 FB220 FBR220 FER235	单级 Single stage			≤55	M16x2Px40L	14	343	3038
	双级 Dual stages			≤50	M12x1.75Px35L	10	139	1232

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

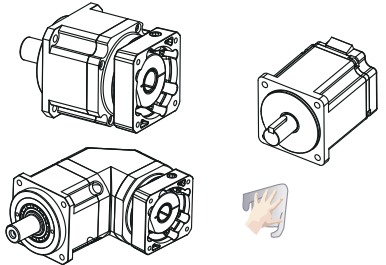
安装说明 / INSTALLATION INSTRUCTION

- 1 减速机外观的确认
*请先确认减速机型号是否正确

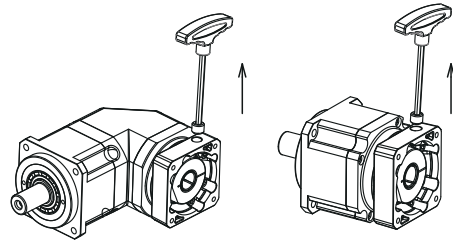
2 伺服马达的安装
* 伺服马达的安装根据以下步骤实施
* 请使用根据订单提供的伺服电机进行安装
- 1.Confirm the appearance of the reducer
Please confirm if the reducer model is correct

2.Installation of the servo motor
The installation of servo motor according to the following steps
Please proceed the installation of the servo motor according to the order

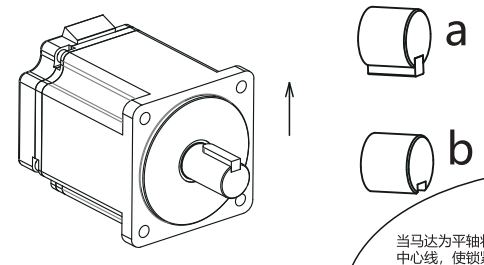
1 确认马达与减速机规格，并将马达及减速机之安装面擦拭干净。
Confirm the specifications of motor and reducer, and wipe the mounting surface of motor and reducer clean.



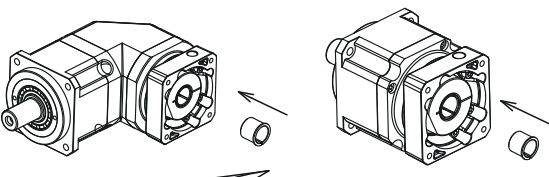
2 将入力法兰侧孔堵头螺丝取出，转动马达锁紧毂，直到锁紧毂螺丝对准法兰侧孔。
Take the plug screw out of the flange side hole, and rotate the motor locking hub until the locking hub screw is aligned with the flange side hole.



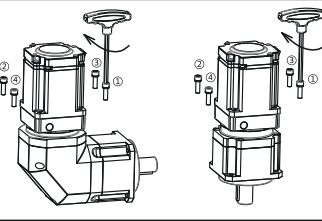
3 取下马达上原先之平键；如有必要，请安装平衡键。
Remove the original flat key from the motor; If necessary, install the balance key.



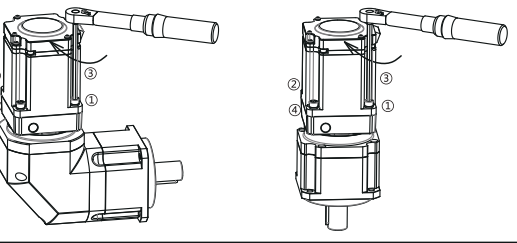
4 确认马达轴心尺寸，若有必要，装上轴套。
Confirm the axis size of the motor and install the sleeve if necessary.



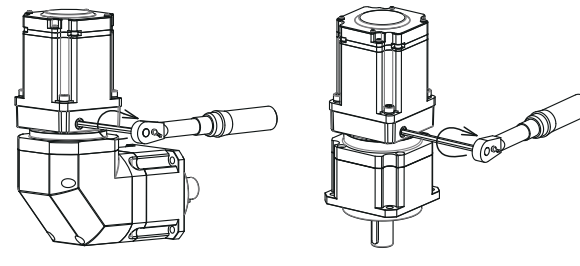
5 直立式的装入马达，以螺丝扭力表（表一）建议扭力值之5%，依1~4顺序，用扳手将附垫片之螺丝轻轻锁上。
Install the motor in a vertical position, and use a wrench to gently lock the screws with gasket according to the order of 1 ~ 4 with 5% of the recommended torque value in the screw torque table (Table 1).



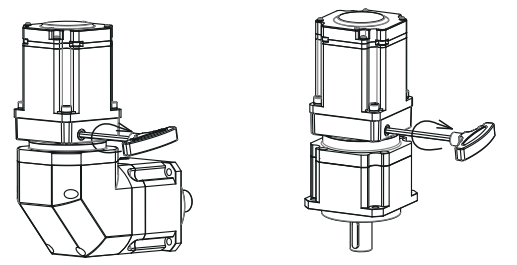
6 将马达与减速机直立摆设，以螺丝扭力表（表一）建议扭力值，依1~4的顺序，用扭力扳手将螺丝锁紧。
Place the motor and reducer vertically. Lock the screws with torque wrench in the order of 1~4, according to the recommended torque value in the screw torque table (Table 1).



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



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



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

