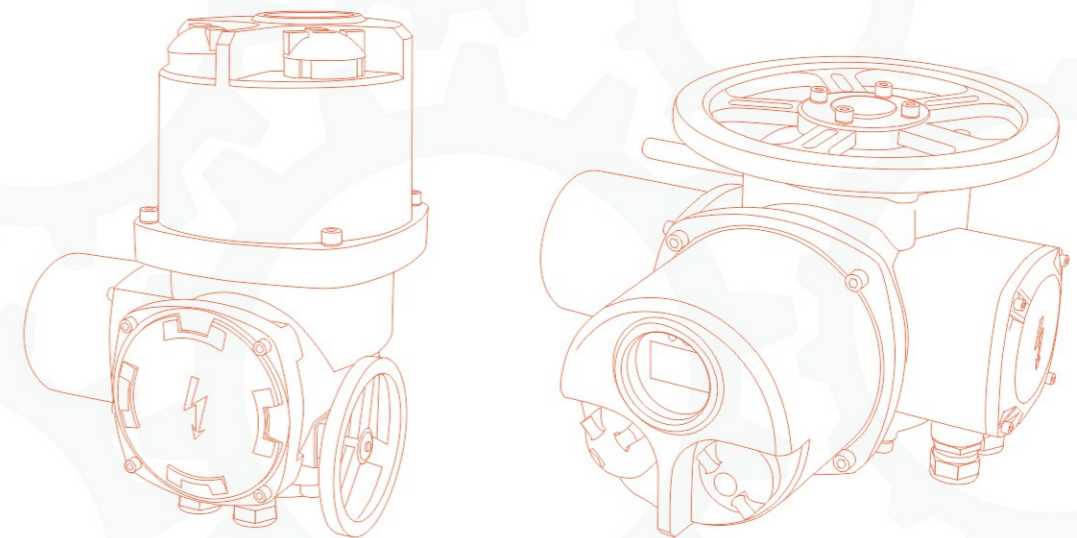


# CHENGLI

常州诚磊阀门科技股份有限公司  
Changzhou Chenglei Valve Technology Co., Ltd.

## CHENGLI

常州诚磊阀门科技股份有限公司  
Changzhou Chenglei Valve Technology Co., Ltd.



电动执行器及齿轮箱系列  
ELECTRIC ACTUATOR  
AND GEAR BOX SERIES

ООО «ТИ-СИСТЕМС» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ  
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# ENTERPRISE BRIEF 企业简介 INTRODUCTION



## 关于我们 About Us

### 我们的理念

质量为先，信誉为重，管理为本，服务为诚

### 我们的承诺

提供优质的产品和高效的服务是企业永恒的主题

### 我们的精神

质量和服务是企业的生命，技术创新是企业不变的灵魂

### Philosophy

Quality first, reputation foremost, management oriented, service honesty-based.

### Promise

Providing high quality products and efficient service is the eternal goal of our enterprise.

### Spirit

Quality and service is our life while technical innovation is our soul.

常州诚磊阀门科技股份有限公司位于江苏常州横山桥镇境内。“诚磊”是国内外著名的电动执行器、电动阀门生产制造企业之一，拥有专业的技术研发团队、专业的管理人才和质量检测人员数十名。公司拥有数控加工中心，数控车床、各式检验设备及其他专业设备五十余台。

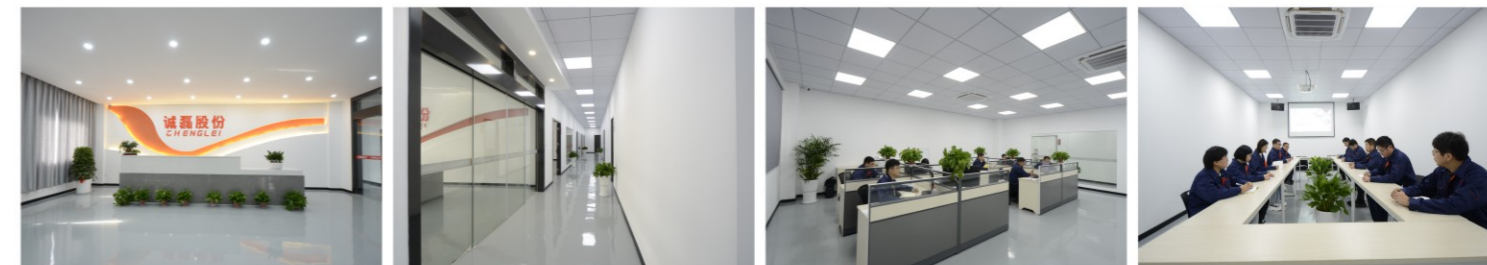
多年来，公司始终致力于技术创新，追求卓越，以一流的技术和严格的质量管理，始终保持产品的领先地位。其自主研发生产的CL系列阀门电动执行器，广泛应用于电站、石油、化工、建筑、水处理、城市建设等各个行业。产品通过互联网、分公司和展销会等销售模式广销于国内外。

“诚磊”人坚持“以诚为本、以质取胜”的发展理念，以一流的产品和一流的服务赢得了用户的广泛赞誉。常州诚磊精密机械有限公司愿与社会各界朋友精诚合作，共同努力，携手未来！

Changzhou Chenglei Valve Technology Co., Ltd. is located in Hengshanqiao Town, Changzhou, Jiangsu. As one of nationally and internationally famous manufacturers of electric actuators and electric valves, "Chenglei" has a professional technical research and development team and dozens of professional management talents and quality inspection personnel. Our company has CNC machining centers, CNC lathes, various inspection equipment and more than 50 sets of other professional equipment.

Over years, our company has always been devoted to technical innovation and the pursuit of excellence, maintaining the leading position of our products with our top-ranking technology and strict quality management. The independently researched, developed and produced CL series valve electric actuator is widely applied in various industries such as power station, petroleum, chemical industry, building, water treatment, urban construction, etc. The products are sold at home and abroad through Internet, branch companies, exhibitions and other sales modes.

By adhering to the development concept of "sincerity based, winning by quality", CL personnel have won wide praise from users with first-class products and excellent services. Changzhou Chenglei Precision Machinery Co., Ltd. expects to cooperate sincerely with friends from all circles and work together for creating a brilliant future.







## 精益生产 Lean Manufacturing

诚磊将产品质量视为公司的生命，基于此，我们不惜投入大量资金引进现代化的生产设备、建设现代化车间，规范了生产程序，使每个员工都能按科学的生产程序生产，使我们的生产程序能得到最大可能的优化，满足日益发展的企业需要，从而在生产中杜绝了浪费，加快了速度，提高了品质，最终赢得了市场。

CL regards product quality as life of the enterprise, so we have made a huge investment in introducing modern production equipment, building modern workshops and standardizing production procedures. Every worker can follow scientific production procedures so that our production procedures are optimized further, meeting the increasing demands, avoiding the waste in production, improving the speed and quality, all of which finally enable us to win the market.

精良的生产设备  
严格执行的国际质量管理体系  
以及完善的检测检验制度  
确保了产品的品质优势

The fine production equipment, strictly implemented international quality management system and perfect inspection and testing system ensure product quality advantages.





# 阀门智能化管控专家

## Valve Intelligent Control Expert

### 01 为工业阀门自动化 提供完整的解决方案 Providing complete solutions for automation of industrial valves

我们不仅设计、制造电动执行器，我们还参与整体的、持续的工业流程管理，以应对安全和生产力在人力及财力方面的挑战。

In addition to designing and manufacturing electric actuators, we also participate in overall and continuous industrial flow management to meet the challenge to human and financial resources in safety and productivity.

### 02 专业与革新 Specialization and innovation

独一无二的专业特长是我们的经营特色。我们的宗旨是紧跟产品应用领域的技术要求，使得我们的产品受到各大总承包商和行业厂家的认可与青睐。通过提高专业技能与工作效能，我们在不断改进产品与服务质量。

Unique professional specialties are our business characteristics. Our principle is to follow the technical requirements in the product application field to make our products recognized and favored by general contractors and manufacturers in various industries. Through enhancing our professional skills and work efficiency, we are continuously improving our product and service quality.

### 03 行业中不可或缺的一员 A member indispensable in the industry

我们视过程控制为核心业务，我们的技术诀窍与经验使我们在市场中建立声望，使我们满怀自信地面向未来。

We view process control as our core business. Our know-how and experience enable us to enjoy reputation in the market and advance towards the future with full confidence.

### 04 性能与安全 Performance and safety

煤炭和化工行业的严格要求，已经塑造出了我们的专业特长，对质量的承诺，以及对工艺的控制，我们不在安全性上作任何的妥协。面向未来，我们有信心在所有领域闯出一片天地。

The strict requirements in coal and chemical industries have already moulded our professional specialties. With commitment to quality and process control, we make no compromise to safety. Looking into the future, we are absolutely certain to open up whole new vistas in all relevant fields.

### 05 品质与信赖 Quality and credibility

诚磊是一家行业技术公司，拥有独一无二的专业技术和丰富经验，我们在众多需求市场上已获得了普遍认可。质量不仅出自我们的用心经营，更是您值得信赖的基石。

CL is a technology-oriented company in the industry, owning unique professional technology and rich experience. We have won wide recognition in many demand markets. Achieved by our elaborate management, quality is the footstone you build your trust upon.

### 06 维护与修理 Maintenance and repair

我们时刻准备奔赴现场，为用户提供：

- 定期的执行器功能检查
- 预维护操作
- 诊断和维修

We are ready to send maintenance engineers to the worksite to provide users with:

- Periodical function checks of actuators
- Pre-maintenance operation
- Diagnosis and maintenance

### 07 安装与调试 Installation and commissioning

电动执行器的调试需要专业的技术和严谨的工作态度，特别是当电动阀门由一个例如现场总线之类的复杂控制系统操控时，更需如此。这就是为什么CL随时待命为用户提供专家级服务和充分支持的原因所在。我们的服务涵盖了以下阶段：• 阀门配套 • 现场安装 • 调试 • 运行

The commissioning of electric actuators requires professional technology and preciseness, especially when the electric valve is controlled by a complex control system like a fieldbus. This is why CL is ready to provide users with expert-level service and sufficient support. Our service mainly covers the following stages: • Valve accessories • Field installation • Commissioning • Running

### 08 培训 Training

我们会按照客户所需，为我们的用户及分销商进行技术培训，包括执行器功能、调试、操作与维护。

According to user requirements, we will provide our users and distributors with technical training, concerning actuator functions, commissioning, operation and maintenance.







Q智能型  
Intelligent type

Q基本型  
Basic type

底座曲柄式  
Base crank type



Z智能型  
Intelligent type

Z基本型  
Basic type

## 产品组成结构

### Product Composition Structure

CL系列电动执行器，是我公司在原有成熟产品的基础上，消化、吸收国外各种先进电动执行器的设计和制造技术，集现场总线技术、绝对编码技术、遥控技术、磁控开关控制等多种最新自控技术为一体，自主研发的全新一代产品，该产品由CLZ型多回转电动装置和CLQ型部分回转电动装置两大系列组成。

CL series electric actuator, it is my company on the basis of the existing mature products, digesting and absorbing foreign advanced technology to design and manufacture of electric actuators, collection of field bus technology, coding technology, control technology, magnetic control switch control and so on the many kinds of latest automatic control technology, independent research and development of a new generation of products, The product is composed of CLZ type multi-turn electric device and CLQ type partial turn electric device.

#### 产品类型:

- ▶ 按执行器控制性能分：普通型和智能型；
- ▶ 智能型按操作方式又分为：智能开关型和智能调节型；智能开关型，用于被驱动装置全开或全关操作。智能调节型，用于被驱动装置需在中间任意位置停止、启动，进行精确控制的操作。多回转执行器系列输出行程大于一圈，理论最大圈数3600圈，并具备自锁功能。
- ▶ 按执行器控制模式分：户外型和隔爆型。

#### The product type:

- ▶ Classified according to actuator control performance: ordinary type and intelligent type;
- ▶ Classified according to operation modes, the intelligent type includes: intelligent on-off type and intelligent control type. The intelligent on-off type is used for full-opening or full-closing operation of the driven device. The intelligent control type is used for the operation in which the driven device needs to stop and start at any middle position and carry out precise control. The output travel of the multi-turn actuator series is more than one turn. The theoretical maximum number of turns is 3600 turns, and it is provided with self-locking function.
- ▶ Classified according to actuator control modes: outdoor type and explosion-proof type



DQ叠加式  
Stacked

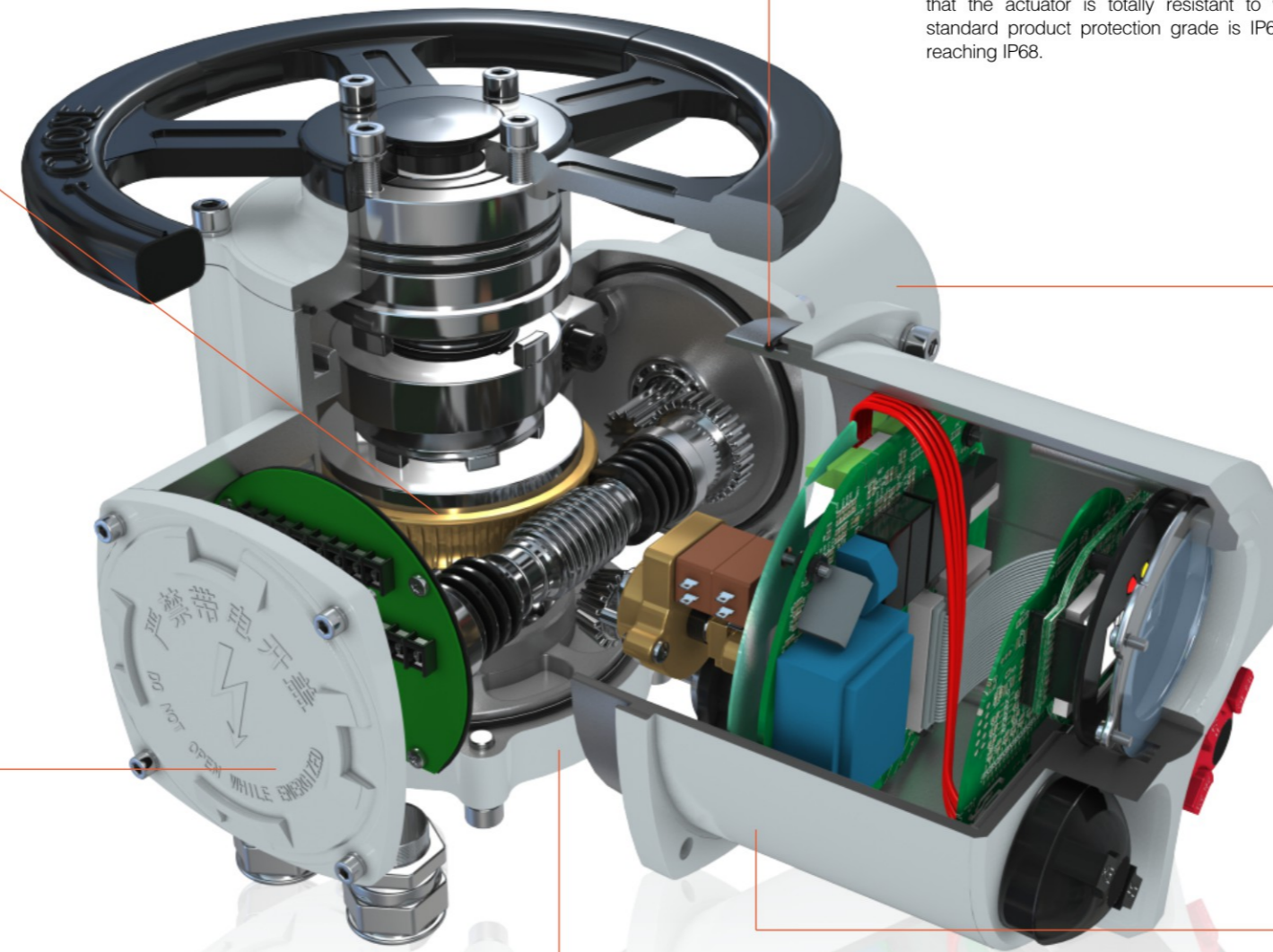
ZXC直行程  
Straight travel

CLSL直行程  
Straight travel



## 产品结构特性

### Product Structural Features



#### 密封结构

##### Sealing structure

执行器采用双密封设计结构，确保执行器能够完全防水、防尘；标准产品防护等级为IP67，最高可达到IP68。

The actuator adopts a double sealing design structure to ensure that the actuator is totally resistant to water and dust. The standard product protection grade is IP67, with the maximum reaching IP68.

#### 驱动电动机

##### Driving motor

电动机采用低惯性、高扭矩电动机，使得电动机启动后可迅速达到峰值扭矩，非励磁时几乎没有超限运动；电动机内有精密的温度传感器，通过控制系统设定超温限值，避免电动机过热引起的损毁。

The motor is a low-inertia and high-torque motor, so that the peak torque can be rapidly reached when the motor is started. There is almost no over-limit movement when there is no excitation. The motor is provided with accurate temperature sensors. Over-temperature limit values can be set through the control system to avoid burning caused by motor overheating.

#### 接线端子盒

##### Terminal box

独立的密封接线端子腔，进行现场接线时，可保证电动执行器内电器部分的密封完整性，同时符合产品隔爆要求。

The independent sealed terminal cavity can ensure closure integrity of the electrical part in the electric actuator during field wiring and also guarantee that the explosion-proof requirements are met.

#### 输出接口

##### Output connection

执行器法兰符合ISO5210/5211(GB12222/12223)标准，也提供符合JB2920标准法兰接口，并可以根据客户要求特殊定制。

The actuator flange meets the ISO5210/5211 (GB12222/12223) standard, and flange connections that meet the JB2920 standard can also be supplied. We can also provide customized products according to customer requirements.

#### 外壳防腐

##### Housing anti-corrosion

执行器外表面采用漆膜坚韧、附着力强的合金铝专用金属漆，具有极强的抗紫外线、耐腐蚀性和高丰满度，能全面提高涂层的使用寿命和自洁性，适应于各种恶劣的生产环境。

The exterior surface of the actuator adopts special metal painting for aluminum alloy with tough painting film and strong adhesion. With very strong resistance to ultraviolet and corrosion and high fullness, it can completely enhance the service life and self-cleaning performance of the coating, and is suitable for various severe production environments.



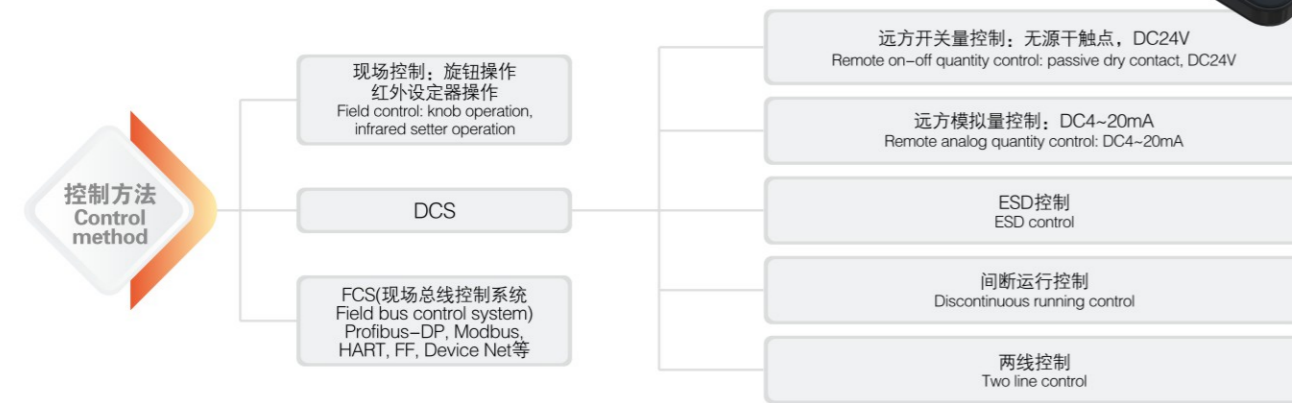
# 产品电气与控制

## Electrical Part And Control



### 多种控制方式

Various operation modes



### 信号输出

Signal output



### 人机界面液晶显示器

Human-machine interface color LCD

采用带背景照明的图形点阵式与段码式液晶显示器，以中文、数字、图形显示转矩、阀位、限位设定等工作状态和报警，即使在夜晚也可清晰地观测和设定。同时装备红、绿两个LED阀位指示灯，即使是在恶劣的环境中仍有很强的穿透性，使用户对执行器的工作状态一目了然。

The graphic dot matrix LCD with background lighting is adopted to display torque, valve position, limit setting and other working status and alarms through Chinese, numerals and graphics. Observation and setting can be carried out clearly even at night. In addition, it is also provided with three LEDs (green, yellow and red) to indicate valve positions, the powerful penetration even under severe service conditions making users clear about the actuator status.

### 总线控制功能

Bus control function

通信模块采用在主板上叠加独立结构，满足不同通信介质、不同通信协议系统的需要。目前支持的通讯协议有 Modbus RTU、PROFIBUS-DPV0/DPV1、HART、FF、DeviceNet。(选配)

### 红外线遥控功能

Infrared remote control function

执行器采用先进的红外线遥控技术，在无需打开执行器箱盖的情况下，通过密封的对话窗口就可进行人机对话。即使在危险场合，本安型遥控器也可安全地对执行器进行参数设置和遥控操作。

The communication module adopts an independent structure superposed on the motherboard to meet the needs of different communication media and different communication protocol systems. Currently the supported communication protocols include Modbus RTU, PROFIBUS-DPV0/DPV1, HART, FF and DeviceNet. (Optional)

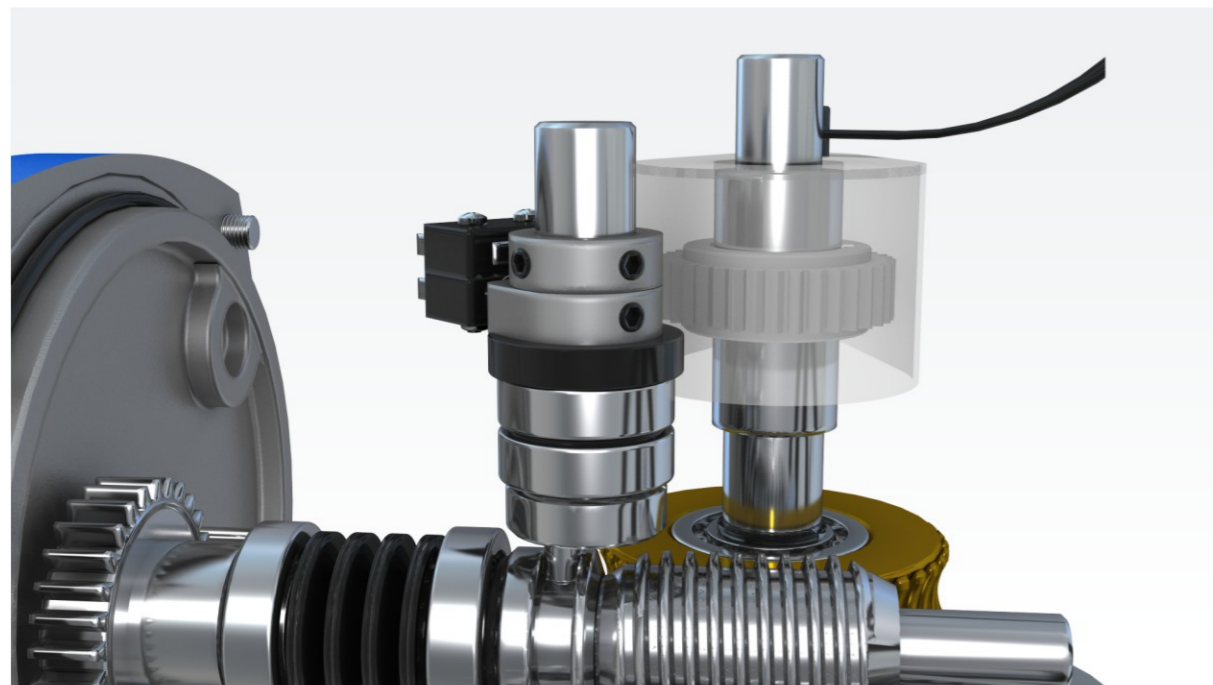
The actuator adopts advanced infrared remote control technology, so that human-machine dialogue can be realized through the sealed dialogue window without opening the actuator case cover. Even in dangerous applications, parameter setting and remote operation of the actuator can be carried out safely through the intrinsically-safe remote controller.





## 产品测量与保护

### Measurement and Protection



#### 精确的扭矩测量和保护

##### Precise torque measurement

专业设计的力矩测量系统以确保执行器过载保护，并实时监测阀门的扭矩变化：

**(标配)机械力矩测量：**传统的机械式力矩触发机构具有成熟稳定可靠的优点，我们在原有力矩基础上进行优化升级，使得力矩装置更加灵敏，使用寿命做了很大的提高。

**(选配)电子力矩测量：**通过检测电机的实时电流、电压和磁通，配合单片机进行综合计算，得到精确的输出力矩，实现连续测量；该系统无需考虑机械磨损，提高了系统的可靠性。

The professionally designed torque measuring system ensures overload protection of the actuator and monitors torque changes of valves in a real-time manner.

**(Standard configuration) mechanical torque measurement:** The traditional mechanical torque triggering mechanism has such advantages as maturity, stability and reliability. We make optimization and upgrading on the basis of previous torque, so as to make the torque device more sensitive and greatly improve the service life.

**(Optional) electronic torque measuring:** Comprehensive calculation is carried out through the real-time current, voltage and magnetic flow of the detection motor in combination with MCU, so as to achieve precise output torque and realize continuous measuring. There is no need to give consideration to the mechanical wear in the system, so that the system reliability is enhanced.

#### 精准的阀位行程测量和保护

##### Precise valve position travel measurement

CLQ执行器采用12位单圈绝对编码器测量阀位行程，角度分辨率达0.088°。

CLZ执行器采用18位绝对编码器测量阀位行程，行程达4096圈，单圈角度分辨率达0.088°。

编码器为磁电机一体，在丢失动力电源情况下，手动操作执行器也无需担心阀位的丢失。采用先进的边界防抖动技术，保证输出数据高速、稳定、可靠，有效提高系统的稳定性和可靠性。

The CLQ actuator adopts 12-bit single-coil absolute coder for measuring the valve position travel with angle resolution of 0.088° . The CLZ actuator adopts 18-bit absolute coder for measuring the valve position travel, with the travel of 4,096 circles and angle resolution of 0.088° .

The coder is integrated with the magneto. When driving power is lost, there is no need to worry about the loss of valve position even if you operate the actuator manually. The advanced border anti-shaking technology is adopted to ensure that the data is output stably and reliably at a high speed and effectively improve system stability and reliability.



#### 电动机监测和保护

##### Motor monitoring and protection

**过热：**电动机温度超过设定的过热保护值，禁止电动机运行，并显示电动机过热报警信息。

**过载和短路：**采用ADI公司精密电压变换芯片设计的电路，满足大范围电流变化的精密测量；过载反时延特性和短路保护满足相关标准。

**瞬时反转保护：**采用瞬时反转延时控制技术，在执行器运行过程中接到反向运转信号时，控制系统将先停机，延时后再执行反向动作，防止机械传动部件的损伤。

**电子刹车：**调节型电动执行器通过死区设置和电子刹车，来保证阀门停止在设定的阀位。

**Overheating:** When the motor temperature exceeds the set overheating protection value, it is forbidden to run the motor, and the motor overheating alarm information will be displayed.

**Overload and short circuit:** The circuit designed with precision voltage converting chips of ADI Company is adopted to meet the need for precise measurement with large-range current changes. The overload inverse time-element feature and short circuit protection meet relevant standards.

**Instantaneous reversal protection:** It adopts instantaneous reversal time delay control technology. When the actuator receives the reversal running signal during its running, the control system will first stop the machine, and then carry out reversal action after time delay, so as to avoid damage to the mechanical driving parts.

**Electronic brake:** The control type electric actuator ensures that the valve can stop at the set valve position through the dead band setting and electronic brake.



## 产品测量与保护

### Measurement and Protection

#### 电源检测与保护

##### Power detection and protection

**相序自动识别:** 采用光电隔离相序自动识别电路, 用户可以按任意相序接入电源线, 阀门始终按正确的方向运行。

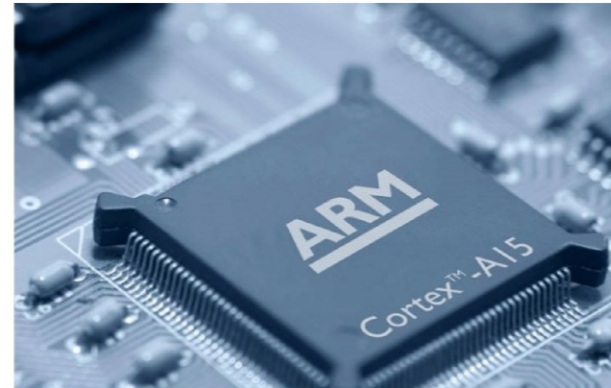
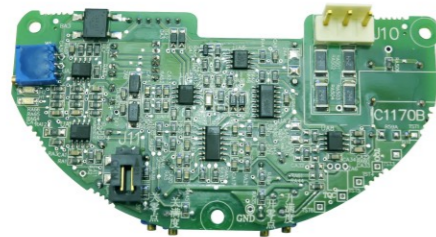
**缺相保护:** 三相电源缺少任意一相, 禁止电动机运行, 并显示缺相报警信息。

**过压和欠压保护:** 三相电源电压超过设定的过压值, 或低于设定的欠压值, 禁止电动机运行, 并显示过压或欠压报警信息。

**Phase sequence automatic recognition:** The circuit with photoelectric isolation and automatic recognition of phase sequence is adopted. Users can connect with the power cord in any phase sequence, and the valve will always run according to the correct direction.

**Phase loss protection:** In case any phase in the three-phase power supply is lost, it is forbidden to run the motor, and the phase loss alarm information will be displayed.

**Over-voltage and under-voltage protection:** When the three-phase power voltage exceeds the set over-voltage value or is lower than the set under-voltage value, it is forbidden to run the motor, and the over-voltage or under-voltage alarm information will be displayed.



#### 智能控制安全保护

##### Intelligent control safety protection

**ESD保护:** 提供了灵活的紧急保护功能, 紧急动作控制方式通过参数设定; 可单独设定紧急保护时的动作方式, 如全开、全关或保位。

**控制状态保护:** 可通过电气箱盖上机械锁锁定远程、现场或停止状态, 以免误操作; 对于更改参数设置, 需输入密码进入设置界面。

**无源监视功能:** 在断电情况下能准确显示阀位信息, 并且能实现无外供电查询执行器已运行数据的功能。

**智能网络安全保护 (可选):** 支持双冗余现场总线通信。在双冗余通信方式下, 当一个通道发生故障时, 通信将自动切换到另一通道, 确保执行器通信和运行正常。

**ESD protection:** It offers flexible emergency protection function. The emergency action control modes can be set through parameters. The action modes during emergency protection such as full opening, full closing or position holding can be set separately.

**Control status protection:** The mechanical lock on the electric box can be used to lock remote, field or stop status to avoid misoperation. As for the setting of parameter modification, it is necessary to input password before entering the setting interface.

**Powerless monitoring function:** In case of power cut, the valve position information can be accurately displayed, and the function of checking without external power supply the running data of the actuator can be realized.

**Intelligent network safety protection (optional):** Dual redundancy field bus communication is supported. With the dual redundancy communication mode, in case of any faults at one channel, the communication will automatically switch to the other channel to ensure normal communication and running of the actuator.

## 产品型号说明

### Product Model Description

1 2 3 4 — 5 / 6 (7)

1. 产品设计序列号 CL  
Product design serial No. CL

2. 驱动型式  
Z — 多回转  
Q — 部分回转  
DQ — 叠加式部分回转  
ZXC — 直行程

Driving mode:  
Z — multi-turn (linear motion)  
Q — part-turn (rotary motion)  
DQ — superposed part-turn  
ZXC — linear motion

3. 适用环境:  
W — 室外环境(一般不表示)  
B — 隔爆型

Applicable environment:  
W — outdoor environment (generally no indication)  
B — explosion-proof type

4. 额定转矩: 阿拉伯数字表示(单位: kgf.m)  
或推力: 阿拉伯数字表示(单位: N)  
Rated torque: indicated by Arabic numbers (unit: kgf.m)  
Said or thrust: Arabic numerals (unit: N)

5. 额定转速: 阿拉伯数字表示(单位: r/min)  
Rated rotation speed: indicated by Arabic numbers (unit: r/min)

6. 控制型式:  
基本型 无字母表示  
Z — 整体开关型  
T — 整体调节型  
NZ — 智能开关型(非侵入式)  
NT — 智能调节型(非侵入式)

Control type:  
Basic type no letter indication  
Z — Integrated integral on-off type  
T — Integrated integral control type  
NZ — Integrated intelligent on-off type (non-invasive type)  
NT — Integrated intelligent control type (non-invasive type)

7. 工作电压: 110V/220V/440V/660V(380V不表示)  
Working voltage: 110 V / 220 V / 440 V / 660 V (380 v no indication)



## 性能参数

### Technical Parameters

工作环境和主要性能参数  
Working environment and main performance parameters



<ul style="list-style-type: none"> <li>● 供电电源: 380V AC ± 10% / 50Hz ± 5%, 或定制 220V AC ± 10% / 50Hz ± 5%, 或定制</li> </ul>	<ul style="list-style-type: none"> <li>● Power supply: 380 V AC + 10% / 50 Hz plus or minus 5%, or custom 220 V AC + 10% / 50 Hz plus or minus 5%, or custom</li> </ul>
<ul style="list-style-type: none"> <li>● 输入信号: A) 模拟量4mA~20mA DC, 输入阻抗250Ω B) 开关量有源24V DC C) profibus-DP或MODBUS (选配)</li> </ul>	<ul style="list-style-type: none"> <li>● Input signals: A) Analog quantity 4mA~20mA DC, input impedance 250Ω B) On-off quantity active 24V DC C) The profibus-dp or MODBUS (optional)</li> </ul>
<ul style="list-style-type: none"> <li>● 输出信号: A) 4mA~20mA DC, 负载抗≤750Ω B) 6组无源触点 C) PROFIBUS或MODBUS (选配)</li> </ul>	<ul style="list-style-type: none"> <li>● Output signal: A) 4 mA ~ 20 mA DC, load resistance Ω 750 or less B) 6 groups of passive contacts C) PROFIBUS or MODBUS (optional)</li> </ul>
<ul style="list-style-type: none"> <li>● 基本误差限: ≤1%</li> <li>● 重复性误差: ≤±1%</li> <li>● 死区设定: 0.1%~9.9%可调</li> <li>● 防护等级: 标配IP67 (水下1米30分钟) 选配IP68</li> </ul>	<ul style="list-style-type: none"> <li>● Fundamental error bound ≤1%;</li> <li>● Repeatability error: ≤±1%;</li> <li>● Dead band setting: 0.1%~9.9% adjustable;</li> <li>● Protection grade: Standard IP67 (1m underwater 30 minutes) Optional IP68</li> </ul>
<ul style="list-style-type: none"> <li>● 环境温度: -20℃~+60℃ 特殊-40℃~+70℃</li> <li>● 环境湿度: ≤95% (+25℃)</li> <li>● 工作制: NZ开关型为S2-15min短时工作制 NT调节型为S4-25%间歇工作制</li> <li>● 防爆标志: ExdI, Exdib II BT4和Exdib II CT4</li> </ul>	<ul style="list-style-type: none"> <li>● Low temperature: -20℃~+60℃ special -40℃~+70℃</li> <li>● Ambient humidity: ≤95% (+25℃)</li> <li>● Working system: S2-15min short-time working system for NZ on-off type S4-25% intermittent working system for NT control Type</li> <li>● Explosion-proof marks: ExdI, Exdib II BT4 and Exdib II CT4</li> </ul>

## 电动执行器的技术参数

### Technical Parameters

Z型多回转

Z Type multi-turn

型号 Model	输出转速 Output Rotation Speed	公称转矩 Nominal Torque	电机功率 Motor Power	额定电流 Rated Current	手动速比 Manual Speed Ratio	最大阀杆直径 Max.Stem Diameter	参考重量 Reference Weight	备注 Remarks
	r/min	N.m	kW	A	I	mm	Kg	
Z5	18/24	50	0.12/0.18	0.6/1	1:1	28	20	
Z10	18/24	100	0.18/0.25	1/1.2	1:1	28	20	
Z15	18/24	150	0.25/0.37	1.2/1.38	1:1	28	20	
Z20	18/24	200	0.37/0.55	1.38/2.7	1:1	40	28	
Z30	18/24	300	0.55/0.75	2.7/3.8	1:1	40	30	
Z45	24	450	1.1	4	1:1	48	58	
Z60	24	600	1.5	4.12	1:1	48	60	
Z90	18/24	900	2.2/3	5.25/7.9	1:1	60	95	
Z120	18/24	1200	3/4	7.9/9.7	1:1	60	100	
Z180	18	1800	4	8.87	80:1	70	120	
Z250	18	2500	5.5	12.05	80:1	70	130	
Z350	18	3500	7.5	15.6	80:1	80	150	
Z500	18	5000	10	20.5	80:1	80	350	

注: 以上为我公司常规供货, 如有特殊要求, 可联系我公司进行定做。  
Note: The above are conventional goods of our company. If you have special requirements, please contact us for customized orders.

Q型部分回转

Q Type part-turn

型号 Model	输出转速 Output Rotation Speed	公称转矩 Nominal Torque	电机功率 Motor Power	额定电流 Rated Current	手动速比 Manual Speed Ratio	最大阀杆直径 Max.Stem Diameter	参考重量 Reference Weight	备注 Remarks
	r/min	N.m	kW	A	I	mm	Kg	
Q5	1	50	0.045	0.16	60:1	19	8.5	
Q10	1	100	0.06	0.18	60:1	19	8.6	
Q15	1	150	0.075	0.22	60:1	19	8.7	
Q20	1	200	0.09	0.26	90:1	28	12.7	
Q30	1	300	0.12	0.32	90:1	28	12.7	
Q40	1	400	0.15	0.37	90:1	28	13	
Q60	1	600	0.18	0.72	87:1	38	21	
Q120	1	1200	0.25	1.0	87:1	38	21	
Q180	1	1800	0.37	1.6	87:1	38	23	
Q300	0.5	3000	0.37	1.6	348:1	55	35	
Q500	0.5	5000	0.55	2.5	348:1	55	35	

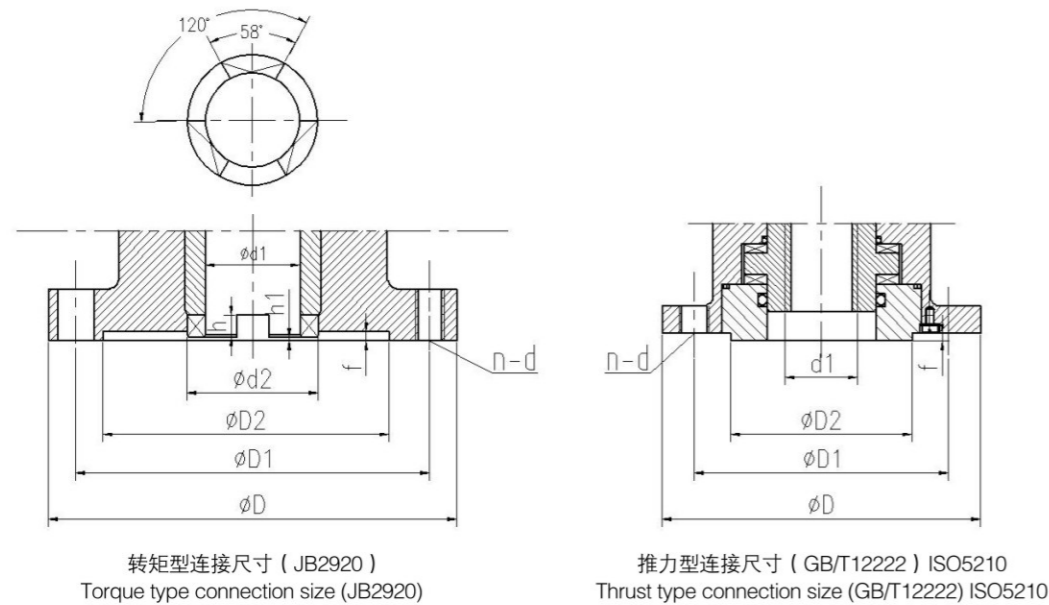
注: 以上为我公司常规供货, 如有特殊要求, 可联系我公司进行定做。  
Note: The above are conventional goods of our company. If you have special requirements, please contact us for customized orders.



# 电动执行器的结构尺寸

## Structure Size

Z型多回转电动执行机构连接尺寸  
Z Series multi-turn electric actuator connection flange dimensions



转矩型连接尺寸 (JB2920)  
Torque type connection size (JB2920)

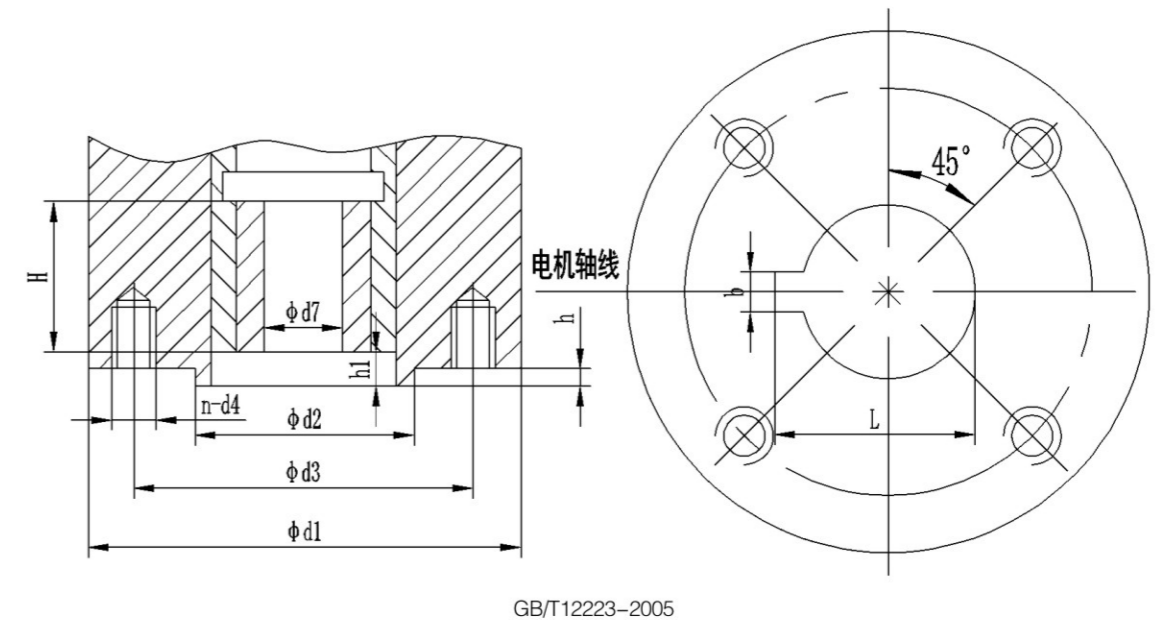
推力型连接尺寸 (GB/T12222) ISO5210  
Thrust type connection size (GB/T12222) ISO5210

参数 Parameters	机座号 Frame No.	转矩型(JB2920) Torque type(JB2920)								推力型(GB/T12222-2005) Thrust type(GB/T12222-2005)							
		D	D1	D2 H9	d2	d1	h	h1	f	n-d	法兰号 Flange No.	D	D1	D2 f8	D1 (Max)	n-d	f
Z10-15	2	145	120	90	45	30	8	2	5	4-M10	F10	125	102	70	Tr28	4-M10	3
Z20-30	3	185	160	125	58	42	10	2	5	4-M12	F14	175	140	100	Tr36	4-M16	4
Z45-60	4	225	195	150	72	50	12	2	5	4-M16	F16	210	165	130	Tr44	4-M20	5
Z90-120	5	275	235	180	82	62	14	2	5	4-M20	F25	300	254	200	Tr60	8-M16	5
Z180-250	7	330	285	220	98	72	16	3	6	4-M24	F30	350	298	230	Tr70	8-M20	5
Z350	8	380	340	280	118	82	20	3	6	8-M20	F35	415	356	260	Tr80	8-M30	5

说明:  
1. 推力型中梯形螺纹直径为最大选用直径;  
2. 连接盘安装孔的位置与电机轴线错开对称分布。

Note:  
1. The trapezoidal thread diameter in the thrust type is the maximum diameter selected.  
2. The connection plate installation holes and motor axis are symmetrically distributed in a staggered way.

Q型部分回转电动执行机构连接尺寸  
Q Series part-turn electric actuator connection flange dimensions



GB/T12223-2005

参数 Parameters	法兰号 Flange No.	d1	d2(f8)	d3	n-d4	d7(max)	H	h	h1	d
Q05	F05	92	35	50	4-M6	19	33	3	2	
Q10	F07	92	55	70	4-M8	19	33	3	2	
Q15										
Q20	F07	125	55	70	4-M8	28	42	3	2	
Q30	F10	125	70	102	4-M10	28	42	3	2	
Q40										
Q60	F10	150	70	102	4-M10	38	50	3	2	
Q90	F12	150	85	125	4-M12	38	50	3	2	
Q120										
Q180	F14	197	100	140	4-M16	38	60	3	3	
Q300	F16	215	130	165	4-M20	55	80	3	3	
Q500										

说明:  
以上为常规订货, 如有特殊需要可在订货时说明!

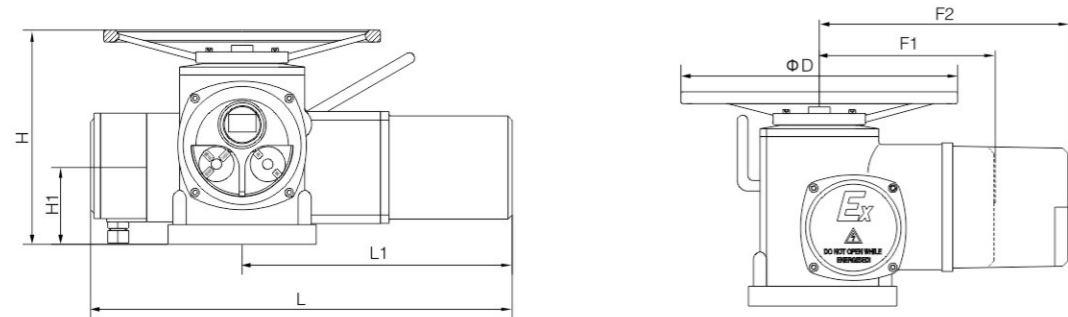
Note:  
The above are for conventional orders. Please specify it when placing orders if you have special requirements.



# 电动执行机构外形尺寸

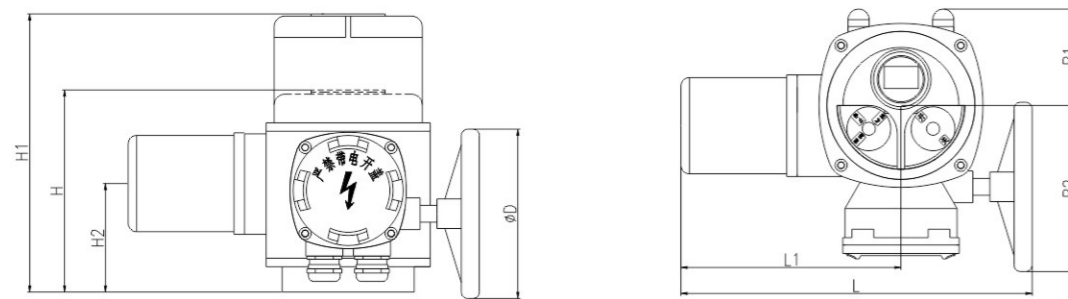
## Multi-turn Electric Actuator Outline

Z型多回转电动执行机构外形尺寸  
Z Series multi-turn electric actuator outline



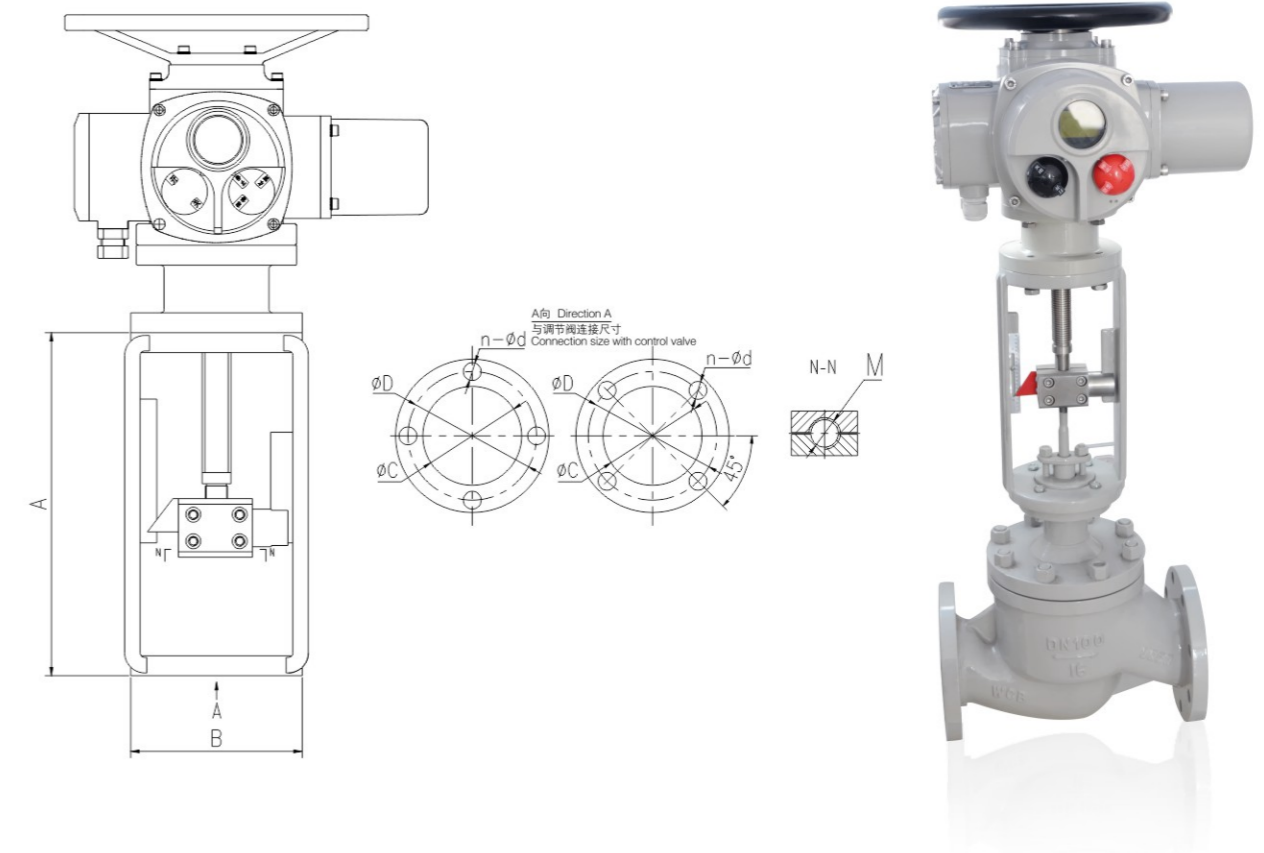
型号 Model	参数 Parameters	L	L1	H	H1	F1普通型 Ordinary type	F2智能型 Smart type	φ D
Z5-15		382	228	233	87	150	203	280
Z20-30		435	278	248	90	157	210	350
Z45-60		640	410	314	116	233	393	400
Z90-120		750	420	404	155	271	431	500
Z180-250		837	476	350	155	304	474	250
Z350		977	616	350	155	304	474	250

Q型部分转电动执行机构外形尺寸  
Q series part-turn electric actuator outline



型号 Model	参数 Parameters	B1	B2	H普通型 Ordinary type	F2智能型 Smart type	H2	L	L1	φ D
Q05-15		68	114	156	270	73	250	157	140
Q20-40		91	157	191	273	103	332	208	160
Q60-180		143	203	227	309	126	424	232	250
Q300-500		143	203	291	373	190	424	232	250

ZXC直行程电动执行机构外形尺寸  
ZXC Series linear motion electric actuator outline and connection flange dimensions



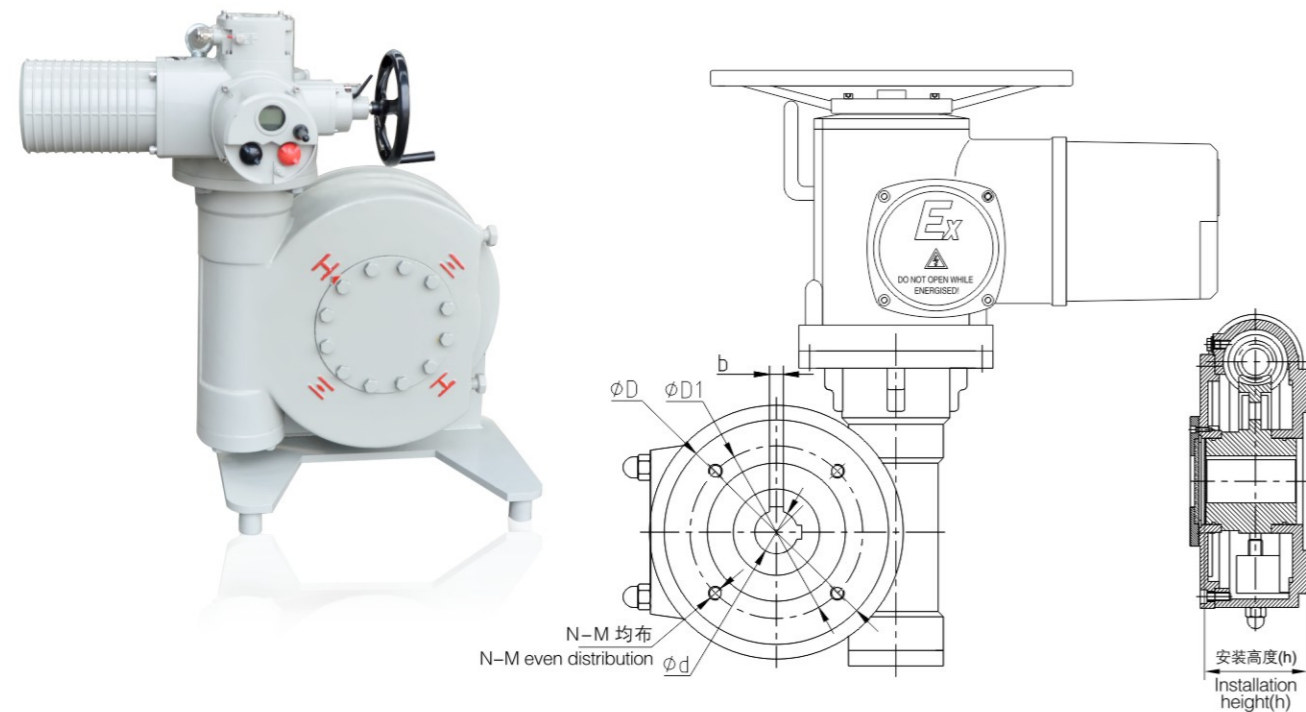
型号 Model	参数 Parameters	A	B	C	D	n-φ d	M
CLZXC4000		175	155	60	80	4-φ 10	M10
CLZXC6300		310	155	80	105	4-φ 12	M12
CLZXC10000		310	155	95	118	4-φ 14	M16 × 1.5
CLZXC16000		310	155	95	118	4-φ 14	M16 × 1.5
CLZXC25000		310	155	100	130	4-φ 18	M20 × 1.5
CLZXC40000		310	155	100	130	4-φ 18	M20 × 1.5
CLZXC50000		310	155	100	130	4-φ 18	M24 × 1.5



# 电动执行机构外形尺寸

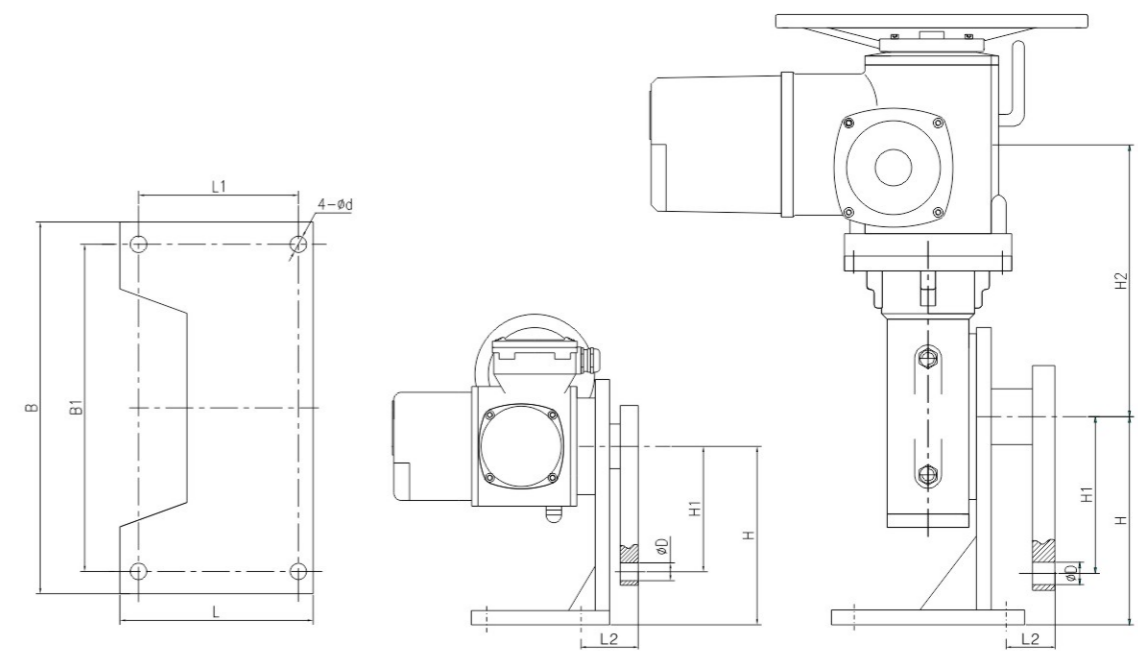
## Multi-turn Electric Actuator Outline

DQ叠加式电动执行机构外形尺寸  
DQ Series (stacked) part of the rotary electric actuator connection size



型号 Model	参数 Parameters	D	D1	N-M	d	n-b	h	一级传动机构 Primary transmission mechanism	蜗轮箱速比 Worm gear box speed ratio	0-90° 时间 Time
DQ200		175	140	4-M16	40	1-10	75	Z15-18	56:1/4#	46
DQ300		210	165	4-M20	45	2-14	85	Z20-18	49:1/5#	40
DQ400		210	165	4-M20	45	2-14	85	Z30-18	49:1/5#	40
DQ600		235	165	4-M20	55	2-14	90	Z45-24	55:1/6#	34
DQ800		235	165	4-M20	55	2-14	90	Z60-24	55:1/6#	34
DQ1000		300	254	8-M16	70	2-18	105	Z60-24	67:1/8#	42
DQ1600		300	254	8-M16	70	2-18	105	Z90-24	67:1/8#	42
DQ2400		350	298	8-M20	90	2-20	110	Z120-24	81:1/9#	51
DQ3200		415	356	12-M20	105	2-22	130	Z180-24	78:1/10#	49
DQ4000		475	406	12-M20	130	2-28	165	Z180-24	82:1/11#	51
DQ6300		560	483	12-M22	160	2-28	185	Z250-24	95:1/12#	59
DQ8000		650	590	12-M27	170	2-32	195	Z350-18	100:1/13#	83

带底座曲柄的电动执行机构外形尺寸  
Actuator with foundation outline and connection dimensions



型号 Model	参数 Parameters	B	B1	L	L1	L2	d	H	H1	H2	D
Q10-40		250	214	160	100	80	18	150	150	/	18
Q60-180		300	264	180	120	100	18	200	200	/	18
DQ200		400	360	250	210	45	20	200	200	219	20
DQ300		500	440	260	215	45	22	280	250	237	30
DQ400		500	440	260	215	45	22	280	250	237	30
DQ600		500	440	260	215	45	22	280	250	296	30
DQ800		500	440	260	215	45	22	280	250	296	30
DQ1000		600	540	315	265	100	26	315	300	346	34
DQ1600		600	540	315	265	100	26	315	300	430	34
DQ2400		600	540	315	265	100	26	315	350	455	34
DQ3200		600	540	315	265	100	26	315	350	520	34



## 电动执行机构外形尺寸 Multi-turn Electric Actuator Outline

CLSL主要技术参数  
CLSL Main technical parameters:

<ul style="list-style-type: none"> <li>● 行程: CLSL202、CLSL204: 0-50mm; CLSL208、CLSL210: 0-60mm; CLSL312、CLSL325: 0-100mm;</li> </ul>	<ul style="list-style-type: none"> <li>● Itinerary: CLSL202, clsl204:0-50mm; CLSL208, CLSL210: 0-60mm; CLSL312, CLSL325:0-100 - mm;</li> </ul>
<ul style="list-style-type: none"> <li>● 电源: 单相交流 110V 50Hz/60Hz 单相交流 220V 50Hz/60Hz 三相交流 380V 50Hz/60Hz 直流 24V</li> </ul>	<ul style="list-style-type: none"> <li>● Power supply: Single-phase ac 110V 50Hz/60Hz Single-phase ac 220V 50Hz/60Hz Three-phase ac 380V 50Hz/60Hz 24 v dc</li> </ul>
<ul style="list-style-type: none"> <li>● 输入信号: 电流信号 (4~20mA或其它非标信号), 输入阻抗250Ω 电压信号 (0-10V或其它非标信号), 输入阻抗&gt;50KΩ</li> </ul>	<ul style="list-style-type: none"> <li>● Input signal: Current signal (4 ~ 20 ma, or other non-standard signals), 250 Ω input impedance Voltage signal (0 to 10 v or other non-standard signals), input impedance Ω &gt; 50 k</li> </ul>
<ul style="list-style-type: none"> <li>● 输出信号: 电流信号 (4~20mA或其它非标信号), 负载阻抗最大750Ω; 电压信号 (0-10V或其它非标信号), 负载阻抗&gt;10KΩ</li> </ul>	<ul style="list-style-type: none"> <li>● Output signal: Current signal (4 ~ 20 ma, or other non-standard signals), largest 750 Ω load impedance Voltage signal (0 to 10 v or other non-standard signals), load impedance Ω &gt; 10 k</li> </ul>
<ul style="list-style-type: none"> <li>● 通信接口: RS485 / HART / FF/PROFIBUS ( 可选项 )</li> <li>● 分辨率: 最小1/1,000, 电路A/D转换器12位</li> <li>● 控制精度: ±0.5% ~ ±1.5% (可能随安装条件不同而不同, 以额定行程的百分数表示)</li> <li>● 回差调节: 0.1% ~ 5.0%</li> </ul>	<ul style="list-style-type: none"> <li>● Communication interface: RS485 / HART/FF/PROFIBUS (optional)</li> <li>● Resolution: minimum 1/1,000, circuit A/D converter 12 bits</li> <li>● Control accuracy: ±0.5% ~ ±1.5% (may vary with installation conditions, expressed as a percentage of rated travel)</li> <li>● Adjustment of return difference: 0.1% ~ 5.0%</li> </ul>
<ul style="list-style-type: none"> <li>● 环境温度: -10°C ~ +60°C</li> <li>● 环境湿度: ≤95% (+25°C)</li> <li>● 保护等级: IP67</li> <li>● 电缆接口: 2-PF 3/4"</li> </ul>	<ul style="list-style-type: none"> <li>● Ambient temperature: -10°C ~ +60°C</li> <li>● Ambient humidity: ≤95% (+25°C)</li> <li>● Protection level: IP67</li> <li>● Cable interface: 2-pf 3/4"</li> </ul>

## 电动执行机构外形尺寸 Multi-turn Electric Actuator Outline



CLSL直行程电动执行器技术参数  
CLSL straight travel technical parameters of electric actuator

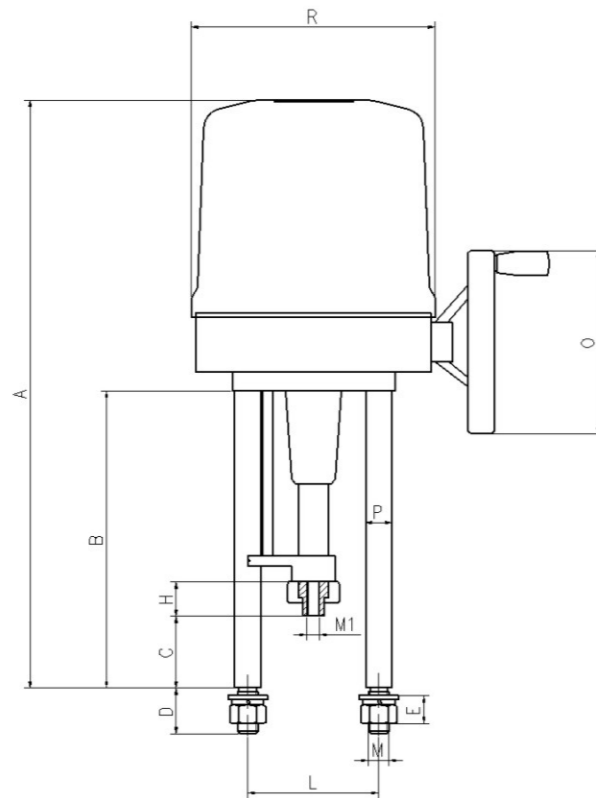
型号 Model	公称推力 Nominal thrust	速度 Speed	行程 Trip	电压 Voltage	电机功率 Motor Power	参考重量 Reference Weight	备注 Remarks
	N	mm/s	mm	V	W	Kg	
CLSL202	2000	1.2	50	AC110 AC220 AC380 DC24 非标定制	10	8	
CLSL204	4000				15	8	
CLSL208	8000		25		10		
CLSL210	10000	1.0	100		40	10	
CLSL312	12000				90	24.5	
CLSL314	14000				100	24.5	
CLSL316	16000				110	24.5	
CLSL320	20000				130	24.5	
CLSL325	25000	130	24.5				



## 电动执行器分体式安装 Electric Actuator Split Installation

### CLSL直行程电动执行器外形尺寸

CLSL Series linear motion electric actuator outline and connection flange dimensions



型号 Model	参数 Parameters	A	B	C	D	E	F	H	O	L	M	P	R	M1
CLSL202		460	235	65	35	20	50	25	φ 100	100	M16	φ 20	φ 186	M10
CLSL204														
CLSL208		485	235	55	35	20	50	25	φ 120	100	M16	φ 20	φ 198	M12
CLSL210														
CLSL312		717	449	70	45	25	100	25	φ 120	155	M20	φ 32	φ 232	M16 × 1.5
CLSL314														
CLSL316														
CLSL320														
CLSL325														

注：C点为执行器关闭最低点！  
Note: point C is the lowest point of actuator closing!

### 主要技术参数

Main technical parameters:

- 使用环境温度：机械单元-20~100℃，分体控制单元-20~60℃；
  - 机械单元和分体控制单元可分离长度（高温屏蔽线）：标准配置20米，最长传输距离可达50米（更长距离需特殊定制）；
  - 防护等级：机械单元及分体控制单元均可达IP67，选配IP68。
- Working temperature: mechanical unit -20~100℃, split control unit -20~60℃;
  - Separable length of mechanical unit and split control unit (high temperature shielding line): standard configuration 20m, longest transmission distance reaching 50m (products with longer distance should be customized);
  - Protection grade: Mechanical unit and split control unit can reach IP67, with IP68 optional.

### 特点

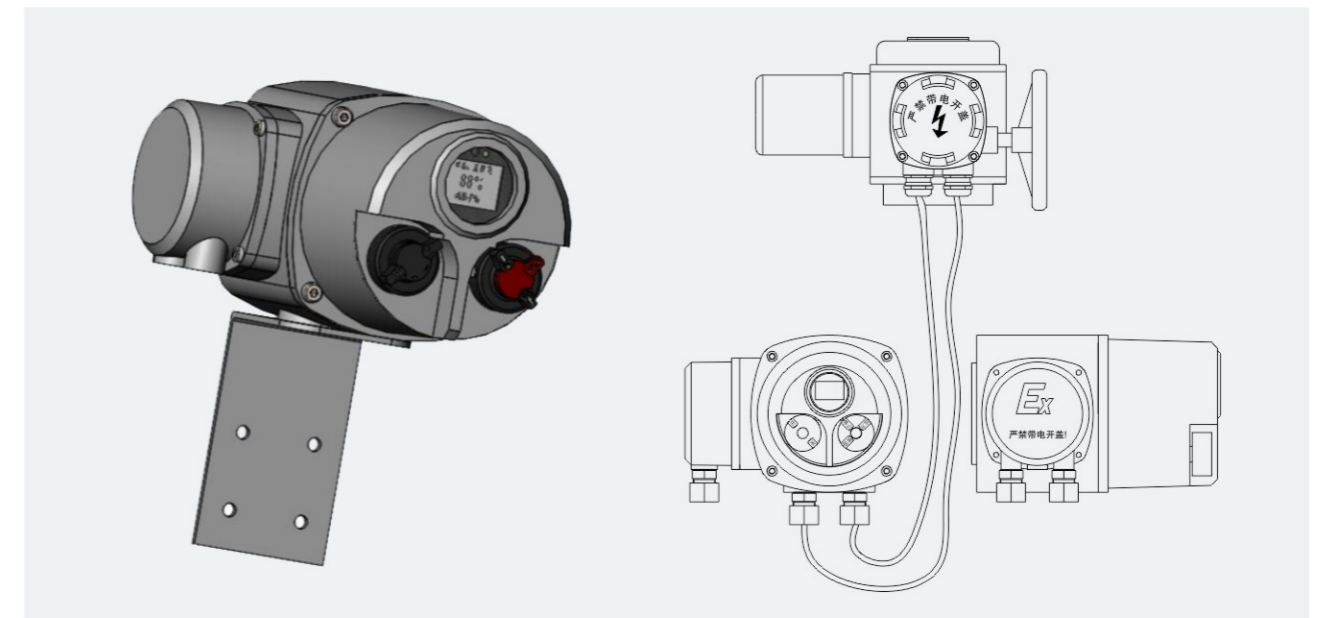
Characteristic

分体式电动执行器，主要针对70℃以上的高温环境或者振动强烈及强磁的环境，智能型电动执行器在上述环境中无法长期工作而开发研制。分体式电动执行器是在诚磊智能化电动执行器的基础上对关键零部件：电机、绝对编码器、信号远传板、控制模块等进行了耐高温屏蔽及减震设计，可以在高温环境、潮湿及高振动、强磁环境中长期使用。

The split electric actuator is mainly researched and developed for high temperature environments above 70℃ or environments with strong vibration and strong magnetism, as the intelligent electric actuator cannot work under the above environments for a long time. Based on Chenglei intelligent electric actuators, the split electric actuator has carried out high temperature resistant, magnetic shielding and shock absorbing design on the key parts such as motor, absolute encoder, signal remote transmission board and control module, so that it can be used under high temperature environments, and environments with humidity, high vibration and strong magnetism for a long time.

### FT分体式电动执行器安装示意图

Installation schematic diagram of FT split electric actuator





## 被驱动装置的运动方式

According To Movement Modes of Driven Devices



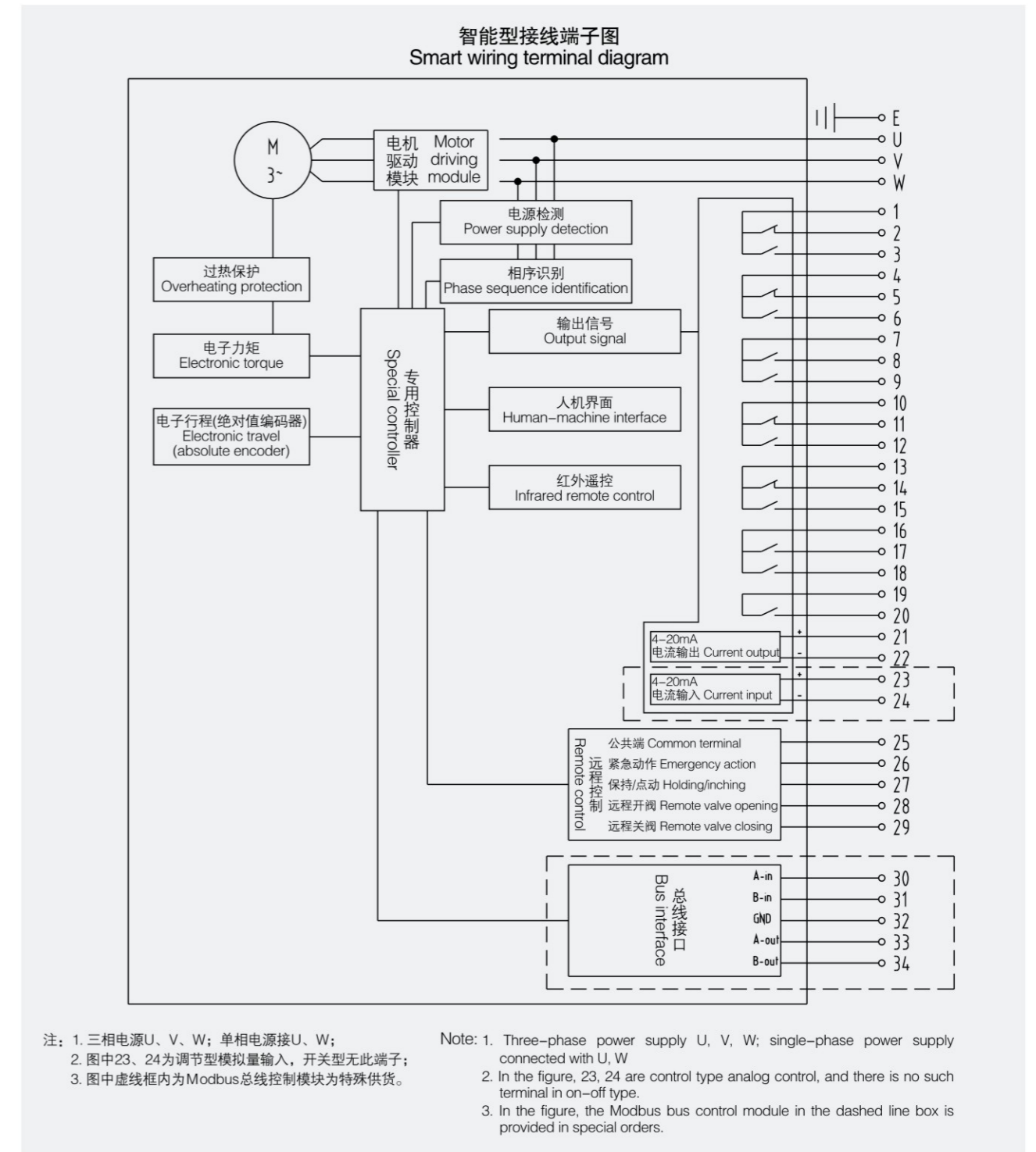
被驱动装置的动作方式决定着执行器的传动形式

The movement modes of driven devices directly determine the driving modes of actuators.

部分回转 (角行程) Part-turn (Rotary motion)	多回转 (直行程) Multi-turn (Linear motion)
角行程电动执行器通常也叫部分回转执行器，机体结构紧凑，可以实现自锁，即使断电情况下也可保持阀位不变。	多回转电动执行器既可以安装在被驱动装置上，也可与齿轮箱配套安装。
齿轮传动组通过精心的设计来提高抗震性和耐用性。尽管执行器配置的行程限位装置，但为了确保在手动操作时防止被驱动装置损坏，仍然设计了机械限位。	为了适应多种功能的需要，应满足大范围的扭矩和转速，且具备自锁功能，以使阀门保持原位。
针对较大扭矩的阀门装置，采用叠加行星减速器，并且与输出轴同轴连接安装，同向转动。	为了用户的安全，执行器在电动时，手轮不能随之转动，且电机驱动优先于手轮驱动。
The rotary motion electric actuator is also called part-turn actuator. With compact structure, the actuator can realize self-locking and maintain the valve position unchanged even in case of power failure.	针对较大扭矩的阀门装置，采用叠加行星减速器，并且与输出轴同轴连接安装，同向转动。
Through elaborate design, the gear driving group can improve seismic resistance and durability. Although the actuator is provided with the travel limit device, mechanical limit is still designed in order to ensure that the driven device will not be damaged during manual operation.	The multi-turn electric actuator can either be mounted directly on the driven device or mounted together with the gearbox.
For valve units of larger torque, the planetary reducer is superposed and coaxially connected and mounted with the output shaft with rotation at the same direction.	In order to meet the needs for various functions, a wide range of torque and rotation speed should be met. It is also provided with the self-locking function, so as to maintain the valve at its original position.
	For the sake of user safety, when the electric actuator is operated electrically, the handwheel cannot turn along with it, and the motor driving should take precedence over handwheel driving.
	For valve units of larger torque, the planetary reducer is superposed and coaxially connected and mounted with the output shaft with rotation at the same direction.

## 接线端子图

Terminal Diagram



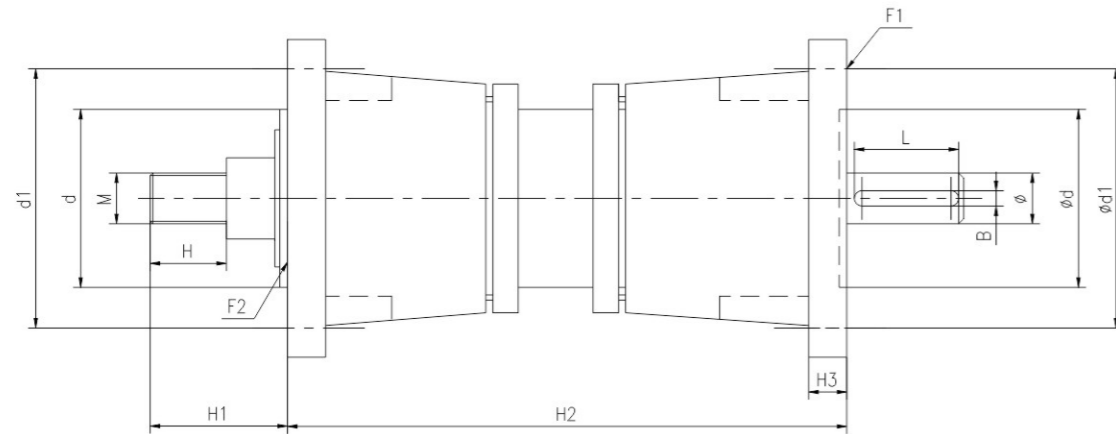


# LE系列线性推力单元

## LE Series Linear Thrust Unit

诚磊LE系列线性推力单元将电动执行器的多回转扭矩转换为直线行程的推力；主要应用于调节阀的精确流量控制。

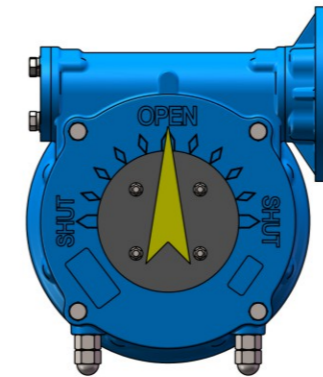
The ChengLei Series Linear Thrust Unit transfer the multi-turn torque of actuator into linear thrust; It is mainly used in regulating valves to fulfill exact control of valve flow.



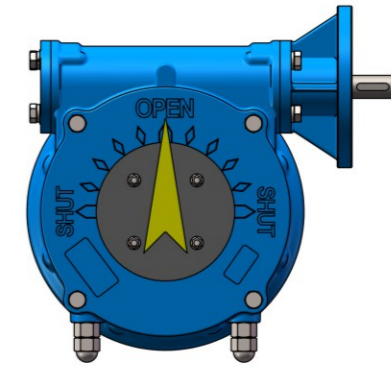
### 外型尺寸 Installation dimensions

型号 Model	选型表 Selection Chart								内部尺寸 Internal Part				输入部分 Input Part						输出部分 Output Part										
	行程 Travel		两法兰总长 H2				输入力矩 Input Torque Nm	最大推力 Max. Thrust Capacity kN	推杆螺纹 Thread of Thrust Rod	螺距 Thread Pitch	联接系数 Conversion Coefficient (f)	额定行程 Rating Range	F1 P.C.D 中心直径	$\phi d$	$\phi$	输入轴 Input Shaft	H	H1	d	M	输出轴 Output Shaft	中心直径 P.C.D							
											F1	$\phi d1$	N-h	$\phi d$	$\phi$	KEY	L	H3			F2	$\phi d1$	N-h						
LE-50	50	100	160	200	220	260	320	360	30	11.5	32*5LH	5	0.312	F10	102	4- $\phi$ 12	70	20	6X6	40	15	30	54	70	20X1.5	F10	102	4- $\phi$ 12	
	250	350	400	450	410	510	560	610																					
	50	100	160	200	220	260	320	360	60	23	32*5LH	5	0.312	F10	102	4- $\phi$ 12	70	20	6X6	40	15	30	54	70	20X1.5	F10	102	4- $\phi$ 12	
	250	350	400	450	410	510	560	610																					
LE-100	50	100	160	200	220	260	320	360	125	39	32*5LH	5	0.312	F10	102	4- $\phi$ 12	70	20	6X6	40	15	30	54	70	20X1.5	F10	102	4- $\phi$ 12	
	250	350	400	450	410	510	560	610																					
	100	160	200		295	355	395		250	64	40*7LH	7	0.256	F14	140	4- $\phi$ 18	100	30	8X7	50	20	50	82	100	36X3	F14	140	4- $\phi$ 18	
	250	320	400		445	515	595																						
LE-100	100	160	200		295	355	395		500	128	40*7LH	7	0.256	F14	140	4- $\phi$ 18	100	30	8X7	50	20	50	82	100	36X3	F14	140	4- $\phi$ 18	
	250	320	400		445	515	595																						

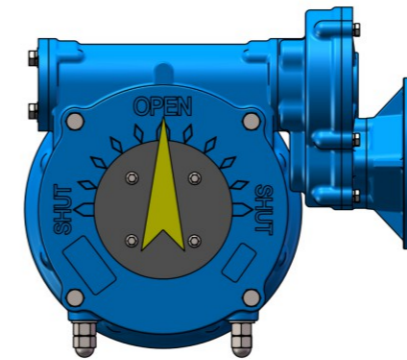
CL-E 电动蜗轮箱  
CL-E Quarter-Turn Worm Gearbox



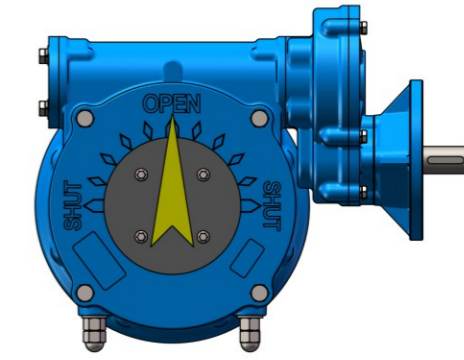
CL-E: 单级电装  
JB 2920连接



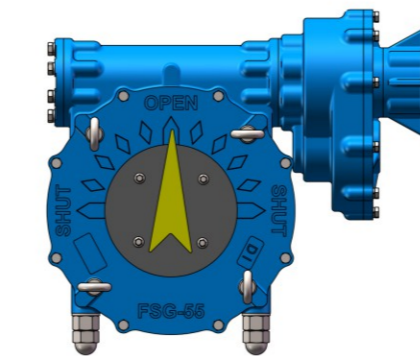
CL-E: 单级电装  
ISO 5210连接



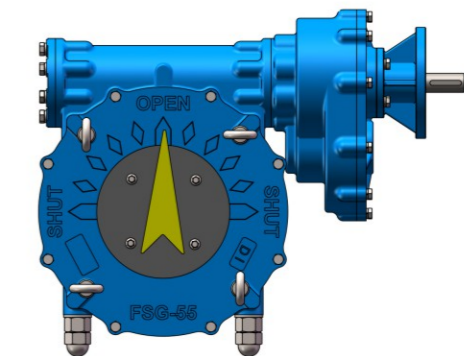
CL-ES: 多级电装  
JB 2920连接



CL-ES: 多级电装  
ISO 5210连接



CL-EDS: 多级电装  
JB 2920连接



CL-EDS: 多级电装  
ISO 5210连接



### 电动蜗轮箱技术参数 Technical parameters of electric worm gear box

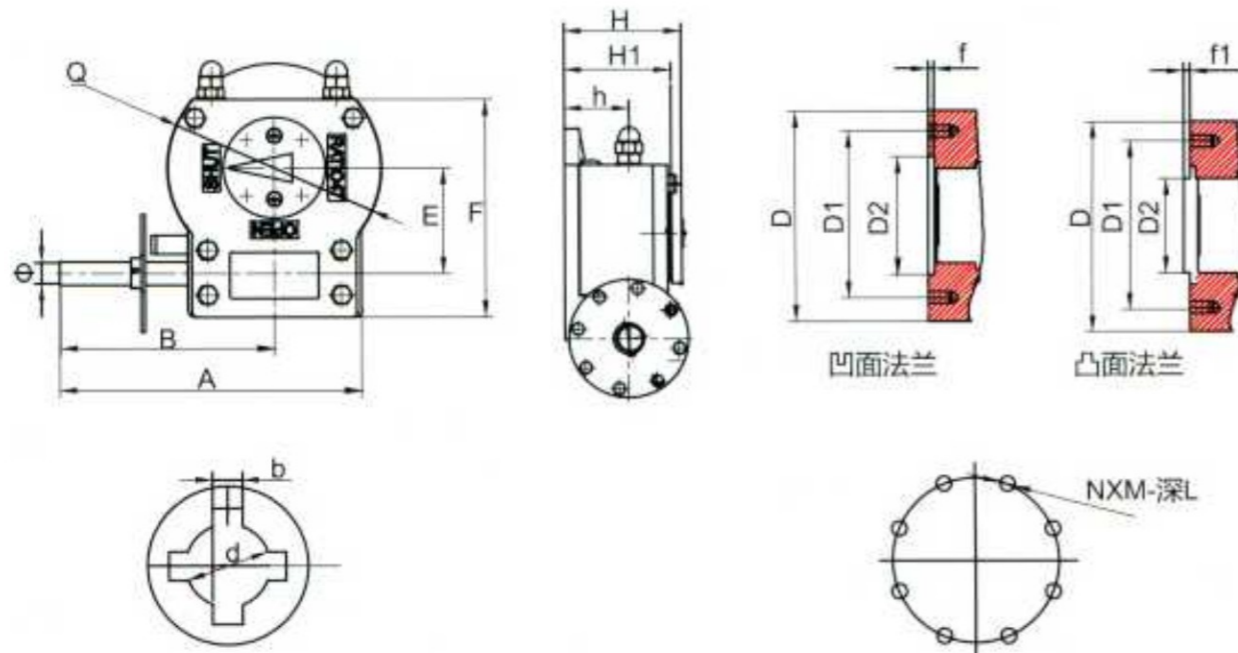
型号 Model	连接法兰 Connecting flange	法兰外圆 Flange outer circle	最大 阀杆直径 Maximum stem diameter	最大 安装高度 Maximum mounting height	电动执行器参数 Electric actuator parameters				
					速比 Speed ratio	输出扭矩 Output torque N.m	输入扭矩 Input torque N.m	JB2920 连接 connection	ISO5210 连接 connection
CL-10E	F14(F12)	175	45	106	44	2000	150	Z15	F10/F14
CL-20E	F16/(F14)	210	55	122	52	3100	200	Z20	F14
CL-20ES					84	3500	150	Z15	F14
					109	3500	120	Z15	F10
					156	3500	80	Z10	F10
					208	2800	50	Z5	F10
CL-30E	F20/ ( F16 )	260	70	122	54	5000	300	Z30	F14
CL-30ES					87	4800	200	Z20	F14
					113	4700	150	Z15	F14
					162	4500	100	Z10	F10
					216	5000	80	Z10	F10
CL-35E	F25/(F20/F16)	300	80	129	56	6500	400	Z45	F14
CL-35ES					90	6500	260	Z30	F14
					117	6500	200	Z20	F14
					168	6500	150	Z15	F10
					224	6200	100	Z10	F10
CL-40E	F25/(F20/F16)	300	90	153	56	10000	600	Z60	F16
CL-40EDS					113	11000	360	Z45	F14
					208	11000	200	Z20	F14
					340	11000	120	Z15	F10
					392	10500	100	Z10	F10
CL-50E	F30(F25)	350	110	160	60	16000	900	Z90	F25
CL-50EDS					121	16000	500	Z60	F14
					223	16000	270	Z30	F14
					364	14500	150	Z15	F14
					420	16000	140	Z15	F10
CL-55E	F30(F25)	350	120	162	57	20500	1200	Z120	F25
CL-55EDS					169	24000	530	Z60	F14
					223	24000	400	Z45	F14
					342	24000	260	Z30	F14
					470	24000	190	Z20	F14

型号 Model	连接法兰 Connecting flange	法兰外圆 Flange outer circle	最大 阀杆直径 Maximum stem diameter	最大 安装高度 Maximum mounting height	电动执行器参数 Electric actuator parameters				
					速比 Speed ratio	输出扭矩 Output torque N.m	输入扭矩 Input torque N.m	JB2920 连接 connection	ISO5210 连接 connection
CL-60E	F35(F30)	415	135	203	64	32000	1700	Z180	F30
CL-60EDS					221	32000	540	Z60	F16
					324	32000	370	Z45	F14
					411	32000	300	Z30	F14
					600	32000	200	Z20	F14
CL-65E	F35(F30)	415	135	203	55	40000	2430	Z250	F30
CL-65EDS					190	40000	780	Z90	F16
					278	40000	540	Z60	F16
					353	40000	420	Z45	F14
					516	40000	290	Z30	F14
CL-70E	F40(35)	475	170	224	68	51000	2500	Z250	F30
CL-70EDS					327	51000	580	Z60	F16
					465	51000	410	Z45	F14
					668	51000	290	Z30	F14
					981	51000	200	Z20	F14
CL-75E	F40(35)	475	170	224	60	60000	3340	Z350	F35
CL-75EDS					288	60000	780	Z90	F16
					410	60000	550	Z60	F16
					590	60000	380	Z45	F14
					866	60000	260	Z30	F14
CL-80E	F48(F40)	560	210	257	62	85000	4570	Z500	F35
CL-80EDS					383	85000	830	Z90	F25
					564	85000	560	Z60	F16
					743	85000	430	Z45	F14
					1128	85000	280	Z30	F14
CL-85E	F48(F40)	560	210	257	56	100000	5960	Z650	F40
CL-85EDS					346	100000	1070	Z120	F25
					510	100000	730	Z90	F16
					671	100000	560	Z60	F16
					1019	100000	370	Z45	F14

## CLSQ部分回转手动装置 CLSQ Partial Rotary Manual Device

该系列是一款90° (±5° 可调)部分回转手动驱动装置。适用于球阀、蝶阀、旋塞阀、旋球阀等类型阀门。箱体采用球墨铸铁，样式新颖、外型美观。法兰全部用ISO5211国际标准，与阀门配套更加方便。

This series is a 90° (±5° adjustable) partial rotation manual drive device. Suitable for ball valve, butterfly valve, plug valve, ball valve and other types of valves. The box body is made of ductile iron with novel style and beautiful appearance. All flanges adopt ISO5211 international standards, which is more convenient to match with valves.



## 技术参数 Technical parameters

型号 Model	CLSQ-24	CLSQ-36	CLSQ-41	CLSQ-47	CLSQ-68
速比 Speed ratio	24:01:00	36:01:00	41:01:00	47:01:00	68:01:00
输入扭矩N.m Input torque	60	75	110	160	190
输出扭矩N.m Output torque	430	800	1350	2000	3300
机械效率M.A±10% Mechanical efficiency	7.2	10.7	12.3	12.5	17.4
蝶阀DN Butterfly valve	125	150-200	250-300	300-350	350-400
球阀DN Ball valve	80	100-125	150	200	250-300

## 连接尺寸 Connection size

型号 Model	CLSQ-24		CLSQ-36		CLSQ-41		CLSQ-47		CLSQ-68					
法兰号 Flange	F07	F10	F10	F12	F12	F10	F16	F12	F14	F16	F16	F20	F25	
法兰外圆(D) Flange outer circle	90	125	125	150	175	175	210	175	175	210	210	255	300	
连接孔中心 Center of connecting hole	D1	70	102	102	125	125	140	165	125	140	165	165	200	254
	NXM-深deepL	4XM8-12	4XM10-15	4XM12-18	4XM12-18	4XM16-24	4XM20-30	4XM12-18	4XM16-24	4XM20-30	8XM16-24	8XM16-24		
凹凸可选(D2) Bump optional	55	70	70	85	85	100	130	85	100	130	160	200		
凹凸高度(f1) Bump height	3		3		4		5		3		4		5	
最大轴孔φd Maximum shaft hole	28		35		45		50		50		70			
安装高度 Installation height	68		81		90		96		96		107			
手轮 Handwheel	250		320		360		460		460		600			

## 外型尺寸 Installation dimensions

型号 Model	CLSQ-24	CLSQ-36	CLSQ-41	CLSQ-47	CLSQ-68
A	189	209	253	253	289
B	144	154	181	181	198
E	44.5	61.5	80.5	89.5	126
F	116	138	179	185	260
H1	61	73	82	89	99
h	34	41	54	54	59
L	/	/	/	/	/
L1	/	/	/	/	/
Q	91	121	160	178	245

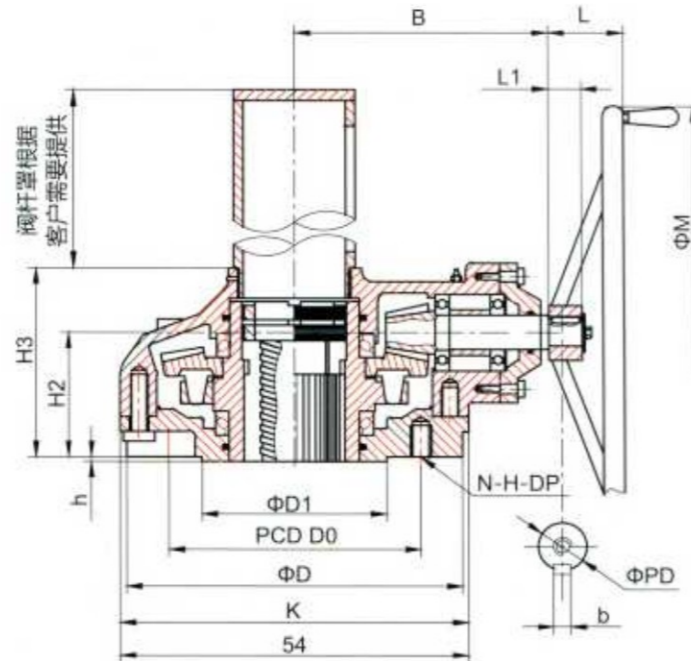


## CLSZ多回转手动装置

### CLSZ Multi-turn Manual Device

该装置是直接安装在闸阀和截止阀等阀门上的手动装置，该装置采用弧齿锥齿轮和平面推力轴承，有运转平稳、扭矩大、噪音小、效率高的优点。在所有的结合部，采用了密封垫全密封处理，达到了防水、防油漏的效果，防护等级为IP65。手轮和阀杆罩可根据用户需求定制。结合各类阀门使用要求及环境，还有单级带电连接、双级带电连接、双级手轮驱动等产品。

The device is a manual device directly installed on the gate valve and globe valve and other valves. The device adopts spiral bevel gear and flat thrust bearing shaft, which has the advantages of smooth operation, large torque, low noise and high efficiency. In all joints, the sealing gasket is fully sealed to achieve the effect of waterproof and oil leakage, and the protection grade is IP65. Handwheel and stem cover can be customized. Combined with all kinds of valve requirements and environment, there are single stage with electric connection, double stage with electric connection, double stage handwheel drive and other products.



### 技术参数 Technical parameters

型号 Model	CLSZ-000	CLSZ-00	CLSZ-0	CLSZ-1	CLSZ-2	CLSZ-3	CLSZ-A3
速比 Speed ratio	2.35:1	03:01	3.6:1	4.5:1	5.2:1	5.6:1	23:01
最大扭矩 Nm Maximum torque	360	480	735	1470	2940	4000	6000
最大推力 N Maximum thrust	43000	64000	98000	196000	340000	490000	630000
最大阀杆直径 mm Maximum stem diameter	25	30	40	52	70	90	110
闸阀 DN Gate valve	50	80-100	150-200	250-400	450-700	800-1000	1200
截止阀 DN Globe valve	50	80	100-150	200-250	300-350	400-500	550-650
参考重量 Kg Reference weight	15	22	28	54	110	198	320

### 连接尺寸 Connection size

型号 Model	CLSZ-000	CLSZ-00	CLSZ-0	CLSZ-1	CLSZ-2	CLSZ-3	CLSZ-A3
法兰号 Flange	F12	F14	F16	F25	F30	F35	F35
法兰外圆(D) Flange outer circle	150	175	210	300	350	415	415
连接孔中心 Center of connecting hole	D0	125	140	165	254	298	356
N-H-深deepL	4-M12-18	4-M16-24	4-M20-30	8-M16-24	8-M20-30	8-M30-45	8-M30-45
凸面(D1Xh) Convex surface	85X3	100X4	130X5	200X5	230X5	260X5	260X5

### 外型尺寸 Installation dimensions

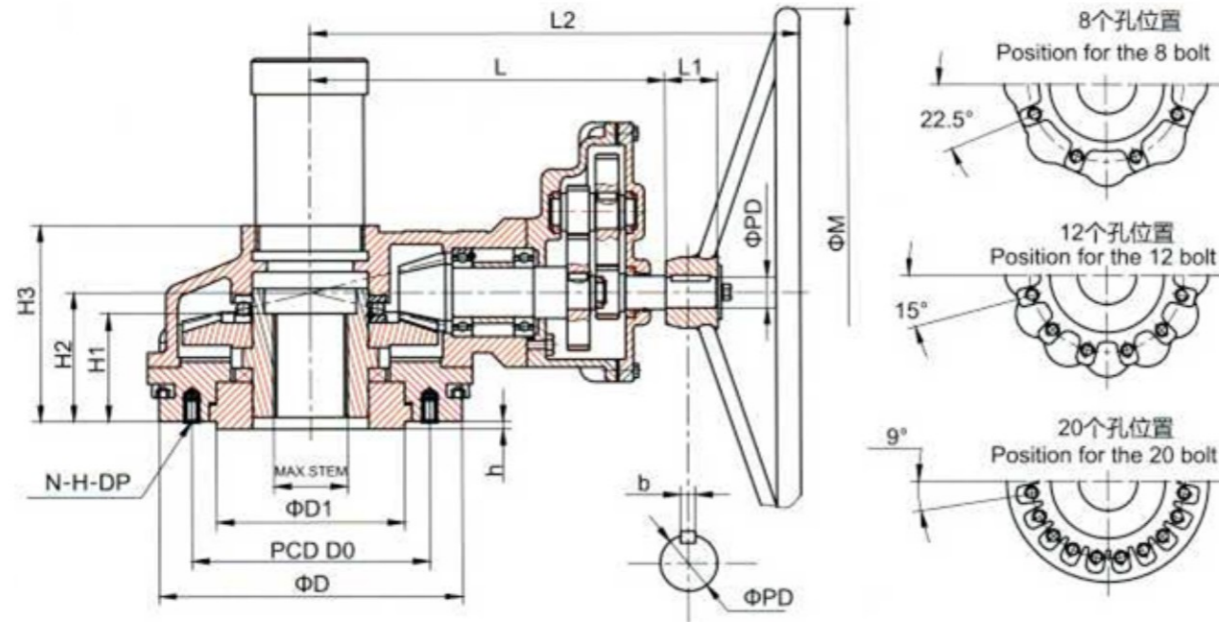
型号 Model	CLSZ-000	CLSZ-00	CLSZ-0	CLSZ-1	CLSZ-2	CLSZ-3	CLSZ-A3
B	150	150	170	233	306	370	395
H2	80	80	85	97	142	160	178
H3	125	125	155	175	210	280	290
L	40	75	92	107	107	118	118
K	155	180	210	285	390	410	510
手轮 Handwheel	PD	26	28	28	32	32	38
	(b)	8x7	8x7	8x7	10x8	10x8	10x8
	L1	40	40	40	50	55	55
	M	300	300	400	460	520	600

## CLSZ-CK二级多回转手动装置

### CLSZ-CK Two-stage Multi-turn Manual Device

该装置是直接安装在闸阀和截止阀等阀门上的手动装置，该装置采用弧齿锥齿轮和平面推力轴承，有运转平稳、扭矩大、噪音小、效率高的优点。在所有的结合部，采用了密封垫全密封处理，达到了防水、防油漏的效果，防护等级为IP65。手轮和阀杆罩可根据用户需求定制。结合各类阀门使用要求及环境，还有单级带电连接、双级带电连接、双级手轮驱动等产品。

The device is a manual device directly installed on the gate valve and globe valve and other valves. The device adopts spiral bevel gear and flat thrust bearing shaft, which has the advantages of smooth operation, large torque, low noise and high efficiency. In all joints, the sealing gasket is fully sealed to achieve the effect of waterproof and oil leakage, and the protection grade is IP65. Handwheel and stem cover can be customized. Combined with all kinds of valve requirements and environment, there are single stage with electric connection, double stage with electric connection, double stage handwheel drive and other products.



### 技术参数 Technical parameters

型号 Model		CLSZ-CK2	CLSZ-CK3	CLSZ-CK5	CLSZ-CK8	CLSZ-CK10	CLSZ-CK15	CLSZ-CK18
速比 Speed ratio		13.6:1	17.6:1	22:01	42.5:1	48:01:00	94.4:1	115.5:1
最大推力 Maximum thrust	N.m	290000	400000	500000	800000	1100000	1250000	1500000
	Kgf.M	29592	408163	510204	81633	112244	127551	153061
最大扭矩 Maximum torque	N.m	2350	3200	5600	8500	13500	18500	26000
	Kgf.M	240	327	398	714	1020	1582	2245
最大阀杆直径 mm Maximum stem diameter		70	80	95	110	130	150	160
参考重量 Kg Reference weight		52	70	115	256	316	470	645

### 连接尺寸 Connection size

型号 Model		CLSZ-CK2	CLSZ-CK3	CLSZ-CK5	CLSZ-CK8	CLSZ-CK10	CLSZ-CK15	CLSZ-CK18
法兰号 Flange		(F20)	F25	F30	F35	F40	F48	F60
法兰外圆(D) Flange outer circle		250	300	350	415	475	560	686
连接孔中心 PCD Center of connecting hole	D0	205	254	298	356	406	483	603
	N-H-深DP deepL	8-M16-24	8-M16-24	8-M20-35	8-M30-45	8-M36-54	12-M36-54	20-M36-54
凸面(D1Xh) Convex surface		140x5	200x5	2300x5	260x5	300x8	370x8	470x8

### 外型尺寸 Installation dimensions

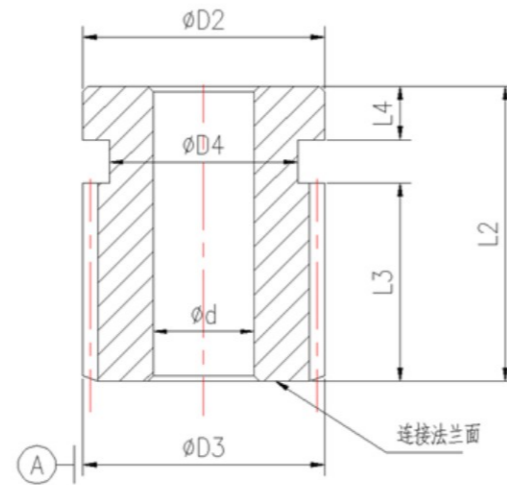
型号 Model		CLSZ-CK2	CLSZ-CK3	CLSZ-CK5	CLSZ-CK8	CLSZ-CK10	CLSZ-CK15	CLSZ-CK18
H1		89	97	120	152	176	188	230
H2		120	130	163	225	290	320	335
H3		144	156	188	250	320	350	365
L		305	330	390	480	500	550	610
L2		400	470	530	640	660	750	810
手轮 Handwheel	PD	28	28	32	38	38	45	45
	(b)	8x7	8x7	8x7	10x8	10x8	12x8	12x8
	L1	40	40	50	50	50	50	50
	M	500	550	600	700	750	800	850



## CLSZ多回转手动装置阀杆螺母外形尺寸 CLSZ Multi-turn Manual Valve Stem Nut Outline Dimensions

用户可根据该图选择加工阀杆螺母的极限尺寸，加工内孔d时，注意与基准A的同轴度要求。阀杆螺母材质有H62, H94, D-2, QT450等，用户可以根据需求选择。

The user can select the limit size of the valve stem nut according to the drawing. When machining the inner hole d, pay attention to the coaxiality requirement with reference A. Stem nut materials are H62, H94, D-2, QT450, etc., users can choose according to their requirements.



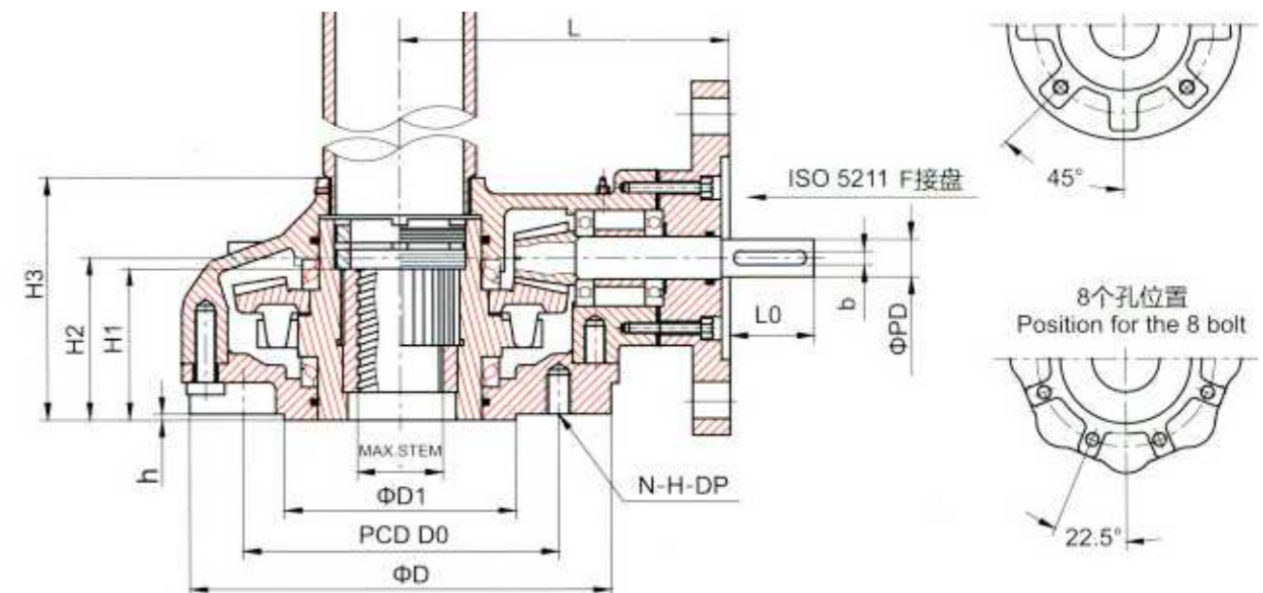
### 外型尺寸 Installation dimensions

尺寸 Size	型号 Model	CLSZ-000	CLSZ-00	CLSZ-0	CLSZ-1	CLSZ-2	CLSZ-3	CLSZ-A3
d		10	20	25	30	35	45	60
D3		50	57	64	74	94	108	132
D2		50	57	65	78	98	118	147
L4		12	15	15	22	31	/	/
L3		25	25	37	46	55	80	108
L2		46	55	65	78	98	120	145
D4		42	50	58	68	86	/	/

## CLSD多回转电动减速装置 CLSD Multi-turn Electric Reduction Gear

该装置是直接安装在闸阀和截止阀等阀门上的电动减速装置，该装置采用弧齿锥齿轮和平面推力轴承，有运转平稳、扭矩大、噪音小、效率高的优点。在所有的结合部，采用了密封垫全密封处理，达到了防水、防油漏的效果，防护等级为IP65。阀杆罩可根据用户需求定制。结合各类阀门使用要求及环境，还有单级带电连接、双级带电连接等产品。

The device is directly installed on the gate valve, globe valve and other valve electric reduction device, the device adopts arc tooth bevel gear and flat thrust bearing shaft, has the advantages of smooth operation, large torque, low noise, high efficiency. In all joints, the sealing gasket is fully sealed to achieve the effect of waterproof and oil leakage, and the protection grade is IP65. Stem cover can be customized. Combined with all kinds of valve requirements and environment, there are single stage with electric connection, double stage with electric connection and other products.



## 技术参数 Technical parameters

型号 Model	CLSD-S10	CLSD-S20	CLSD-V0	CLSD-V1	CLSD-V2	CLSD-V3	CLSD-V35	CLSD-V4	CLSD-V5	CLSD-V6	CLSD-V7	CLSD-V8	CLSD-V9	CLSD-V10
速比 Speed ratio	2.3:1	2.35:1	3.1:1	3.6:1	04:01	4.1:1	04:01	05:01	05:01	05:04	6.5:1	07:01	05:01	5.5:1
传动效率 Transmission efficiency	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
最大转矩N.m Max-torque	216	363	480	600	900	1600	4000	6000	8000	10000	18500	28000	65000	100000
最大阀杆直径 mm Maximum stem diameter	20	25	28	40	52	60	70	90	100	120	130	150	180	200
参考重量 Kg Reference weight	10	12	21.5	28	35	50	95.5	160	190	288	390	565	980	1300

## 连接尺寸 Connection size

型号 Model	CLSD-S10	CLSD-S20	CLSD-V0	CLSD-V1	CLSD-V2	CLSD-V3	CLSD-V35	CLSD-V4	CLSD-V5	CLSD-V6	CLSD-V7	CLSD-V8	CLSD-V9	CLSD-V10
与阀门连接法兰号JB2920-81 Connect with valve flange	1号 法兰	1号 法兰	2号 法兰	3号 法兰	4号 法兰	5号 法兰	7号 法兰	8号 法兰	8号 法兰	9号 法兰	10号 法兰			
与阀门连接法兰号 Connect flange number with valve	F10	F12	F14	F16	(F20)	F25	F30	F35	F35	F40	F48	F60	F60	F80
法兰外圆(D) Flange outer circle (D)	125	150	175	210	250	300	350	415	415	475	560	686	686	900
连接孔中心 Center of connecting hole	D1	102	125	140	165	205	254	298	356	356	406	483	603	800
	NXM-DP	4-M10-15	4-M12-18	4-M16-24	4-M20-30	8-M16-24	8-M16-24	8-M20-30	8-M30-45	8-M30-45	8-M36-54	12-M36-54	20-M36-54	20-M42-63
凸面 (D1Xh) Convex	70X3	85X3	100X4	130X4	140X5	200X5	230X5	260X5	260X5	300X8	370X8	470X8	470X8	650X8
与电装连接 Connect with denso	PDXb	20X6	20X6	30X8	30X8	30X8	40X12	45X14	50X14	50X14	50X14	50X14	60X18	70X20
	L0	45	45	50	50	50	60	65	65	65	70	80	80	100
与电装连接法兰号JB2920-81 Connect flange	1号 法兰	1号 法兰	2号 法兰	3号 法兰	4号 法兰	4号 法兰	5号 法兰	7号 法兰	7号 法兰	8号 法兰	8号 法兰	9号 法兰	10号 法兰	10号 法兰

## 外型尺寸 Installation dimensions

型号 Model	CLSD-S10	CLSD-S20	CLSD-V0	CLSD-V1	CLSD-V2	CLSD-V3	CLSD-V35	CLSD-V4	CLSD-V5	CLSD-V6	CLSD-V7	CLSD-V8	CLSD-V9	CLSD-V10
H1	38	46	55	62	75	85	105	120	145	165	195	200	285	355
H2	65	70	70	75	90	100	140	160	155	210	220	250	245	330
H3	110	125	128	145	160	170	225	280	280	335	360	380	410	540
L	160	175	200	220	248	265	320	325	395	405	430	480	680	720

## 伞齿轮与电装组合参数 Combination parameters of bevel gear and electric gear

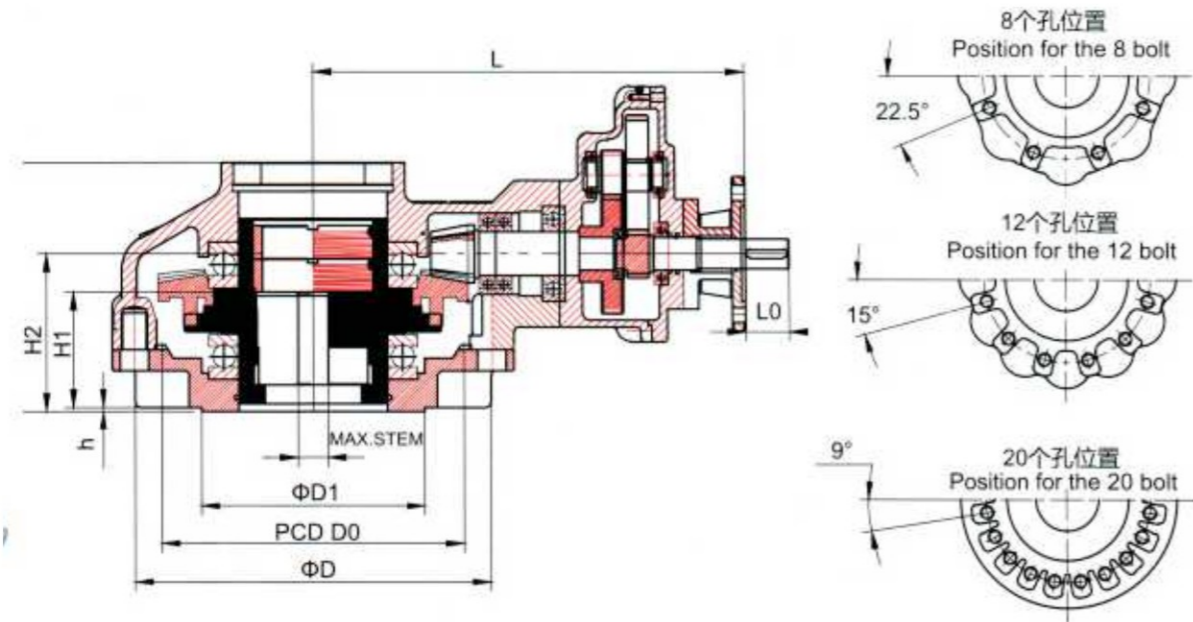
型号 Model	CLSD-S10	CLSD-S20	CLSD-V0	CLSD-V1	CLSD-V2	CLSD-V3	CLSD-V35	CLSD-V4	CLSD-V5	CLSD-V6	CLSD-V7	CLSD-V8	CLSD-V9	CLSD-V10
电装参数 Denso parameters	输入力矩Nm Input torque	108	142	176	203	298	474	950	1020	1490	1700	3500	5000	10000
	转速 r/min Speed	36	36	36	36	24/28	24/36/48	24/36/48	24/36/48	24/36	24/36	24	24	24
	接盘GB2920-81 Flange	Z10	Z15	Z20	Z20	Z30	Z45	Z90	Z120	Z180	Z180	Z350	Z500	Z1000
伞齿轮参数 Bevel gear parameter	接盘 flange	F10	F10	F10/F14	F10/F14	F14/F16	F14/F16	F16/F25	F16/F25	F25/F30	F25/F30	F25/F30	F30/F35	F35/F40
	输出力矩 Nm Manufacturing torque	185	375	480	600	900	1600	3700	6000	8000	10000	18200	28000	42500



## CLSD多回转电动减速装置 CLSD Multi-turn Electric Reduction Gear

该装置是直接安装在闸阀和截止阀等阀门上的电动减速装置，该装置采用弧齿锥齿轮和平面推力轴承，有运转平稳、扭矩大、噪音小、效率高的优点。在所有的结合部，采用了密封垫全密封处理，达到了防水、防油漏的效果，防护等级为IP65。阀杆罩可根据用户需求定制。结合各类阀门使用要求及环境，还有单级带电连接、双级带电连接等产品。

The device is directly installed on the gate valve, globe valve and other valve electric reduction device, the device adopts arc tooth bevel gear and flat thrust bearing shaft, has the advantages of smooth operation, large torque, low noise, high efficiency. In all joints, the sealing gasket is fully sealed to achieve the effect of waterproof and oil leakage, and the protection grade is IP65. Stem cover can be customized. Combined with all kinds of valve requirements and environment, there are single stage with electric connection, double stage with electric connection and other products.



### 技术参数 Technical parameters

型号 Model	CLSD-V0-2	CLSD-V1-2	CLSD-V2-2	CLSD-V3-2	CLSD-V35-2	CLSD-V4-2	CLSD-V5-2	CLSD-V6-2	CLSD-V7-2	CLSD-V8-2	CLSD-V9-2	CLSD-V10-2
最大阀杆直径 Maximum stem diameter	35	40	52	60	70	90	110	120	130	150	180	200
参考重量 Kg Reference weight	35	41	52	70	115	195	256	316	470	645	1350	1700

### 连接尺寸 Connection size

型号 Model	CLSD-V0-2	CLSD-V1-2	CLSD-V2-2	CLSD-V3-2	CLSD-V35-2	CLSD-V4-2	CLSD-V5-2	CLSD-V6-2	CLSD-V7-2	CLSD-V8-2	CLSD-V9-2	CLSD-V10-2
法兰号 Flange	F14	F16	(F20)	F25	F30	F35	F35	F40	F48	F60	F60	F80
法兰外圆(D) Flange outer circle	175	210	250	300	350	415	415	475	560	686	686	900
连接孔中心 Center of connecting hole PCD D0	140	165	205	254	298	356	356	406	483	603	603	800
N-H-DP	4-M16-24	4-M20-30	8-M16-24	8-M16-24	8-M20-35	8-M30-45	8-M30-45	8-M36-54	12-M36-54	20-M36-54	20-M36-54	20-M42-65
凸面(D1Xh) Convex surface	100x4	130x4	140x5		230x5	260x5	260x5	300x8	370x8	470x8	470x8	650x8

### 外型尺寸 Installation dimensions

型号 Model	CLSD-V0-2	CLSD-V1-2	CLSD-V2-2	CLSD-V3-2	CLSD-V35-2	CLSD-V4-2	CLSD-V5-2	CLSD-V6-2	CLSD-V7-2	CLSD-V8-2	CLSD-V9-2	CLSD-V10-2
H1	55	62	89	97	120	120	152	176	188	230	200	200
H2	70	75	120	130	163	160	225	290	320	335	330	330
H3	128	145	144	156	188	280	250	320	350	365	380	380
L	160	180	305	330	390	400	480	500	550	610	817	964



型号 Model	可选减速比 Optional reduction ratio	输出力矩 N.m Output torque	输入力矩 N.m Input torque	与阀门连接法兰 Connect flange to valve		与执行器连接法兰 Connect flange with actuator		
				ISO5210	ISO5210/ GB2920-81	ISO5210	输入轴 (直径X键X高) Input shaft (Diameter X bond X height)	GB2920-81
CLSD-V0-2	05:01	450Nm	41Nm	F14	F12/Z30	F10	φ20X6X40	Z10
	06:01		35Nm	F14	F12/Z30	F10	φ20X6X40	Z10
	08:01		80Nm	F14	F12/Z30	F10	φ20X6X40	Z10
	9.7:1		68Nm	F14	F12/Z30	F10	φ20X6X40	Z10
CLSD-V1-2	05:01	600Nm	150Nm	F16	F14/Z45	F10	φ20X6X40	Z15
	08:01		108Nm	F16	F14/Z45	F10	φ20X6X40	Z10
	10:01		80Nm	F16	F14/Z45	F10	φ20X6X40	Z10
	11.6:1		68Nm	F16	F14/Z45	F10	φ20X6X40	Z10
CLSD-V2-2	06:01	900Nm	200Nm	F20	F14/Z60	F14	φ30X8X50	Z20
	08:01		150Nm	F20	F14/Z60	F14	φ30X8X50	Z15
	10:01		125Nm	F20	F14/Z60	F10	φ20X6X40	Z15
	13.2:1		100Nm	F20	F14/Z60	F10	φ20X6X40	Z10
CLSD-V3-2	06:01	1600Nm	350Nm	F25	F16/Z120	F14	φ20X6X40	Z45
	08:01		244Nm	F25	F16/Z120	F14	φ30X8X50	Z30
	10:01		230Nm	F25	F16/Z120	F14	φ30X8X50	Z30
	17.6:1		125Nm	F25	F16/Z120	F10	φ20X6X40	Z15
CLSD-V35-2	06:01	4000Nm	845Nm	F30	F25/Z250	F25	φ50X14X80	Z90
	08:01		600Nm	F30	F25/Z250	F10	φ20X6X40	Z60
	10:01		542Nm	F30	F25/Z250	F16	φ40X12X60	Z60
	15:01		366Nm	F30	F25/Z250	F14	φ30X8X50	Z45
	18:01		300Nm	F30	F25/Z250	F14	φ30X8X50	Z30
	20:01		270Nm	F30	F25/Z250	F14	φ30X8X50	Z30
	23:01		250Nm	F30	F25/Z250	F14	φ30X8X50	Z30
CLSD-V4-2	10:01	6000Nm	800Nm	F30	F25/Z350	F25	φ50X14X80	Z90
	15:01		542Nm	F30	F25/Z350	F16	φ40X12X60	Z60
	20:01		400Nm	F35	F25/Z350	F16	φ40X12X60	Z45
	25:01:00		366Nm	F35	F25/Z350	F16	φ40X12X60	Z45
	30:01:00		270Nm	F35	F25/Z350	F16	φ40X12X60	Z30
	35:01:00		244Nm	F35	F25/Z350	F14	φ30X8X50	Z30
	40.5:1		230Nm	F35	F25/Z350	F14	φ30X8X50	Z30
	10:01		1000Nm	F35	F30/Z800	F25	φ50X14X80	Z120
CLSD-V5-2	15:01	8000Nm	750Nm	F35	F30/Z800	F25	φ50X14X80	Z90
	20:01		542Nm	F35	F30/Z800	F16	φ40X12X60	Z60
	25:01:00		474Nm	F35	F30/Z800	F16	φ40X12X60	Z60
	30:01:00		400Nm	F35	F30/Z800	F16	φ40X12X60	Z45
	35:01:00		366Nm	F35	F30/Z800	F16	φ40X12X60	Z45
	42.5:1		250Nm	F35	F30/Z800	F14	φ30X8X50	Z30
	10:01		10000Nm	1355Nm	F40	F35/Z1000	F25	φ50X14X80
15:01	845Nm	F40		F35/Z1000	F25	φ50X14X80	Z90	
20:01	645Nm	F40		F35/Z1000	F25	φ50X14X80	Z60	
25:01:00	542Nm	F40		F35/Z1000	F16	φ40X12X60	Z60	
30:01:00	474Nm	F40		F35/Z1000	F16	φ40X12X60	Z60	
35:01:00	400Nm	F40		F35/Z1000	F16	φ40X12X60	Z45	
46:01:00	310Nm	F40		F35/Z1000	F14	φ30X8X50	Z30	

型号 Model	可选减速比 Optional reduction ratio	输出力矩 N.m Output torque	输入力矩 N.m Input torque	与阀门连接法兰 Connect flange to valve		与执行器连接法兰 Connect flange with actuator				
				ISO5210	ISO5210/ GB2920-81	ISO5210	输入轴 (直径X键X高) Input shaft (Diameter X bond X height)	GB2920-81		
CLSD-V7-2	15:01	18500Nm	1700Nm	F48	F40	F30	φ60X18X90	Z180		
	20:01		1355Nm	F48	F40	F25	φ50X14X80	Z120		
	25:01:00		1020Nm	F48	F40	F25	φ50X14X80	Z120		
	30:01:00		845Nm	F48	F40	F25	φ50X14X80	Z90		
	40:01:00		680Nm	F48	F40	F16	φ40X12X60	Z90		
	50:01:00		542Nm	F48	F40	F16	φ40X12X60	Z60		
	60:01:00		474Nm	F48	F40	F16	φ40X12X60	Z45		
	70:01:00		400Nm	F48	F40	F16	φ40X12X60	Z45		
	80:01:00		366Nm	F48	F40	F16	φ40X12X60	Z45		
	94:01:00		300Nm	F48	F40	F14	φ30X8X50	Z30		
CLSD-V8-2	15:01	26000Nm	2500Nm	F60	F40/F48	F30	φ60X18X90	Z250		
	20:01		1700Nm	F60	F40/F48	F30	φ60X18X90	Z180		
	25:01:00		1355Nm	F60	F40/F48	F25	φ50X14X80	Z120		
	30:01:00		1290Nm	F60	F40/F48	F25	φ50X14X80	Z120		
	40:01:00		1020Nm	F60	F40/F48	F25	φ50X14X80	Z120		
	50:01:00		800Nm	F60	F40/F48	F25	φ50X14X80	Z90		
	60:01:00		645Nm	F60	F40/F48	F16	φ40X12X60	Z60		
	70:01:00		542Nm	F60	F40/F48	F16	φ40X12X60	Z60		
	80:01:00		500Nm	F60	F40/F48	F25	φ40X12X60	Z60		
	112:01:00		400Nm	F60	F40/F48	F16	φ40X12X60	Z45		
	CLSD-V9-2		20:01	65000Nm	4300Nm	F60	F48	F35	φ60X18X90	Z500
30:01:00		3000Nm	F60		F48	F30	φ60X18X90	Z350		
40:01:00		2300Nm	F60		F48	F30	φ60X18X90	Z250		
50:01:00		1700Nm	F60		F48	F30	φ60X18X90	Z180		
60:01:00		1700Nm	F60		F48	F30	φ60X18X90	Z180		
75:01:00		1355Nm	F60		F48	F25	φ50X14X80	Z120		
95:01:00		1020Nm	F60		F48	F25	φ50X14X80	Z120		
105:01:00		1020Nm	F60		F48	F25	φ50X14X80	Z120		
130:01:00		800Nm	F60		F48	F25	φ50X14X80	Z90		
185:01:00		600Nm	F60		F48	F16	φ40X12X60	Z60		
CLSD-V10-2		20:01	100000Nm		6500Nm	F80	F60	F40	φ70X20X100	Z650
		30:01:00			5000Nm	F80	F60	F35	φ60X18X90	Z500
		45:01:00			3500Nm	F80	F60	F35	φ60X18X90	Z350
	60:01:00	2500Nm		F80	F60	F30	φ60X18X90	Z250		
	100:01:00	1700Nm		F80	F60	F30	φ60X18X90	Z180		
	120:01:00	1355Nm		F80	F60	F25	φ50X14X80	Z120		
	145:01:00	1200Nm		F80	F60	F25	φ50X14X80	Z120		
	165:01:00	1000Nm		F80	F60	F25	φ50X14X80	Z120		
	210:01:00	800Nm		F80	F60	F25	φ50X14X80	Z90		
	335:01:00	500Nm		F80	F60	F16	φ50X14X80	Z60		