

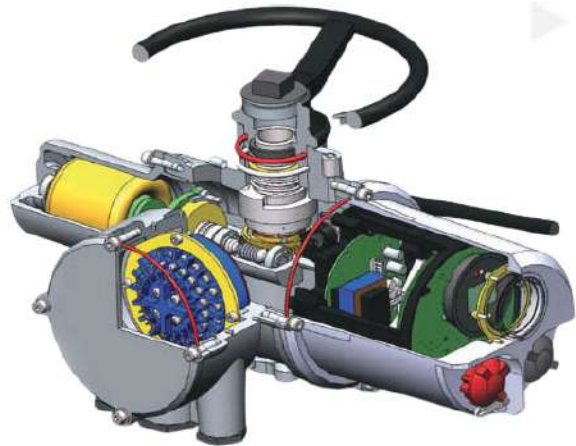
INTELLIGENT **ELECTRIC ACTUATOR**



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FUNCTION CHARACTERISTICS

CONVENIENT PARAMETER REMOTE CONTROL SETTING

Before application, users can complete a set of working parameters, parameter inspection and status inquiry by means of aligning the dedicated infrared setting device with the actuator without opening the cover. In such cases, the setting procedures are simplified on the one hand, and operation safety of equipment is improved on the other hand, particularly for sites where flameproof is extremely necessary.

ABUNDANT ON-LINE DISPLAY

The product adopts liquid crystal display technology with a built-in LCD and displays working states such as torque and valve state, normal valve opening and limit setting of the actuator in the form of Chinese character, digit and figure. Besides, it can display important failure information, helping users remove it quickly. Meanwhile, it also provides three high-brightness light-emitting diodes in different colours to indicate valve positions, letting users find out the status of the actuator clearly even at night.

IMPROVED AUTO DIAGNOSIS AND PROTECTION

The actuator can diagnose the overload, overheat, overcurrent and power supply status of electric motors and automatically identify the phase sequence of the three-phase supply, which avoids the reverse malfunction owing to a change of wire connection. In addition, the actuator can lock up or operate the preset safety position when under emergency circumstances. The actuator is also allocated with the ability to accurately measure the output torque and protect the valve from getting stuck. If the valve gets stuck, no action will be operated within the preset time period after the starting signal is given out and the power supply of the electric motor will be cut off by the control circuit so as to prevent overheating of the electric motor, and the alarm will be emitted.

CONVENIENT CHARACTERS DISPLAY

Utilizing large-sized dot matrix LCD, users can switch between Chinese and English conveniently. Without the necessity to remember multiple identification characters, users only need to operate in terms of debugging guide and complete the debugging process of the actuator easily within several steps.

STRONG FIELD ADAPTABILITY

The entire design adopts double-seal protection. The shell is designed to be completely waterproof, dust-proof and "airproof", with IP68 protection capacity. In the installation and debugging stages, even if the terminal cover of the actuator keeps open for a long period, the secondary sealing between the terminal disk and the internal cavity prevents dust and moisture from entering into the internal cavity of an actuator, protects the electric motor and the control circuit from being eroded. Meanwhile, optoelectronic isolation and surge protection technologies are used in the design of internal and external signal interfaces of actuators, which dramatically improve reliability. The internal control circuit can be divided in terms of functions and the modular construction facilitates maintenance.



CONSTRUCTION

01

The solid handwheel can provide reliable emergency manual operation in the circumstance of power failure.

02

The high-quality aluminium alloy shell is exquisite and convenient. It is painted with protective material for the purpose of adapting to the extremely hostile environment, and the coating can be changed to other types as required.

03

The low inertia and high torque electric motor enables the motor to reach peak torque rapidly after starting and experiences in almost no overrun during non-exciting period. Precise temperature switch is embedded in the coil of electric motor, which protect the motor from being affected by environment temperature, maintaining it within maximum temperature capacity. Meanwhile the motor shaft is independent from the worm.

04

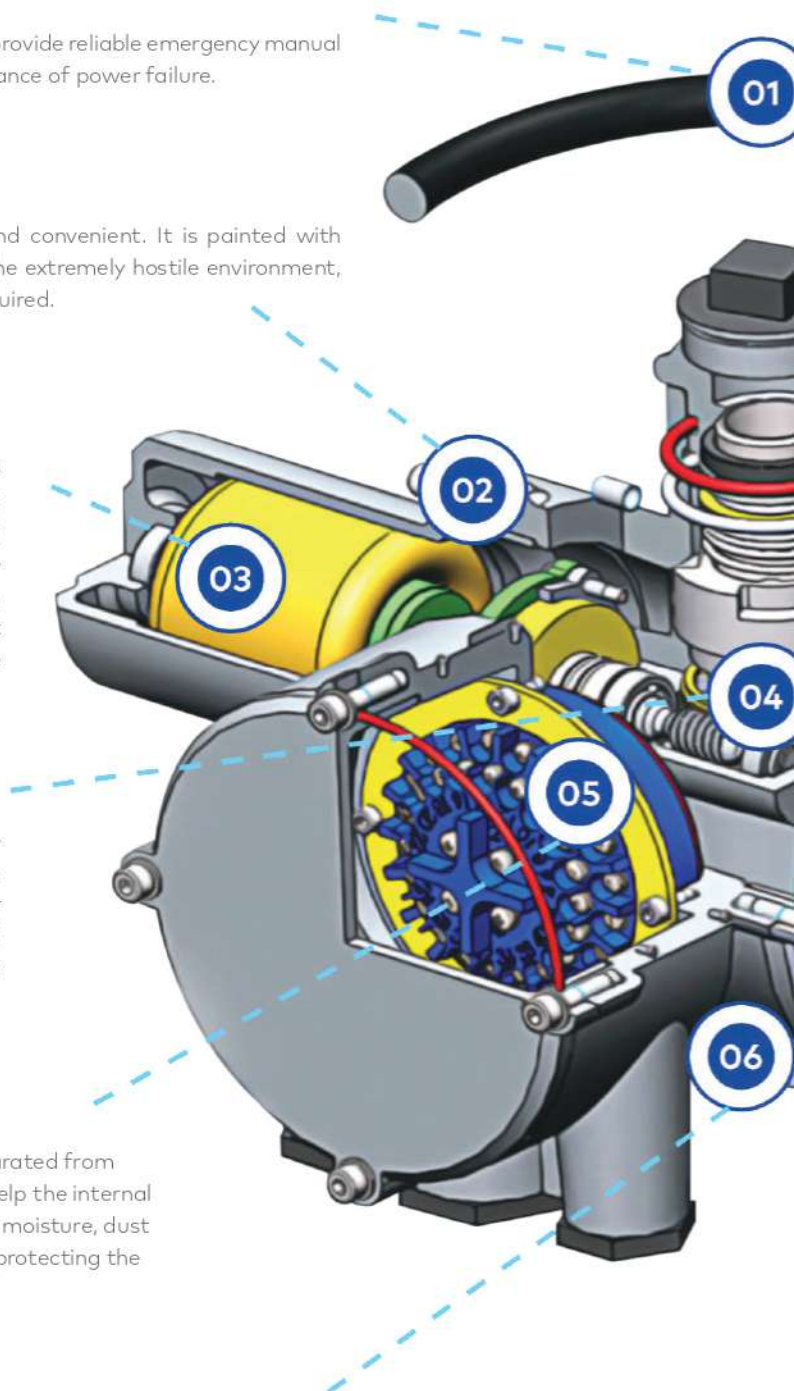
The worm transmission chain of the electric motor is simple and exquisite in structure. With constant transmission efficiency and mechanical self-locking function, the motor doesn't need any brake. The transmission part is infused with long-acting lubricating oil, which facilitates long-term operation without the necessity of maintenance.

05

The double-seal design provides a terminal box that is separated from the control room and completely sealed. Such design can help the internal side of the actuator separate from the outside, preventing moisture, dust and harmful gas from entering into the actuator and fully protecting the internal components and parts.

06

The lubricated thrust bearing which is designed to improve lifetime and facilitate disassembly can help remove the actuator easily without changing the valve position. The simple and dismountable driving shaft sleeve can be processed in terms of the valve rod so as to connect with the valve.



VIEW OF ACTUATOR

07

A professionally designed useful work measurement system is used as the output torque measurement system. The system is developed from the familiar electric energy measurement technology, which can obtain accurate, repeatable torque measurements, independent of frequency, voltage and temperature changes.

08

The manual/electric reversion handle can be operated at any time safely. At the same time as pressing down the handle with proper force, turn the handwheel slowly so as to drive the internal clutch. The clutch can be automatically segregated when the electric motor is power on and is locked up.

09

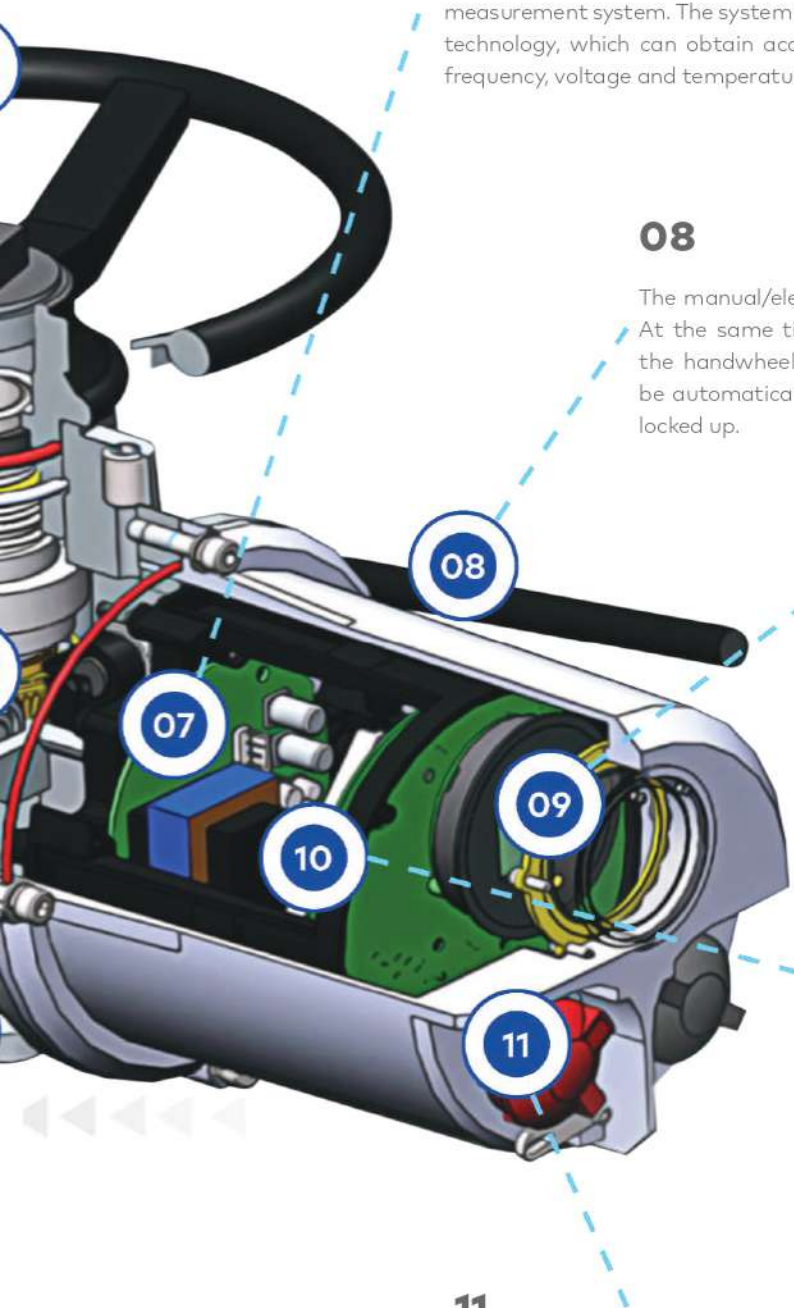
The LCD on the control panel can provide transient and latest state and valve position in Chinese or in English. Using intuitional menu structure, it can provide calibration and diagnosis information, including torque curve, operation and failure record, electric motor state, local information, hardware data and so on.

10

The control unit is composed of the control module, supervision module and protection module. Utilizing a clip cage-type installation structure, it is allocated with functions of damping and buffering. Besides, the plug-in type connection facilitates rapid and inerrable disassembly.

11

The "on"/ "off" rotary knob and the "local"/ "halted"/ "remote" rotary knob with padlock all adopt isolated magnetic transfer Hall effect device with favourable sealing performance and no cut-through shaft. Meanwhile, such a design eliminates troubles that may bring by the fragile reed switch that is easy to break down.





PRODUCT SECURITY

PHASE SEQUENCE PROTECTION

By using phase synchronization technology, users needn't consider the phase sequence of three-phase alternating current when installing wire connection of actuator. It can guarantee the correct power supply phase sequence for a three-phase electric motor and enable the actuator to operate correctly in terms of commands all the time during the operation process.



MOTOR PROTECTION

Single phasing or overload of the three-phase motor may lead to the rapid increase of current, consequently giving rise to the overheating and burning down of the electric motor. CKD actuator supervises the operating state of the three-phase power supply and the electric motor all the time. When single phasing, overcurrent and overload happen, it will immediately cut off the power supply and emit alarm information on the LCD interface and in the remote control room.



VALVE JAM PROTECTION

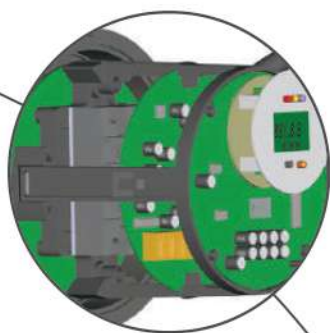
During the process of closing or opening the valve, the actuator executes no torque protection function within a period of 3s to 10s and closes or opens the valve which gets stuck. If the operation mentioned above still fails to close or open the valve, then the actuator will cut off the power supply for the electric motor and emit a failure alarm.





BATTERY ANTI-INTERFERENCE PROTECTION

The actuator adopts optoelectronic isolation for all the input/output channels and can bear $\pm 2\text{KV}$ rapid transient pulse train interference and 4KV electrostatic discharge impact. The signal ended can bear $6\text{KV}/3\text{KA}$ surge impact and the power supply end can support $20\text{KV}/1010\text{KA}$ surge impact, which realizes the electric separation of the actuator and is allocated with the extremely high anti-interference property.



TORQUE PROTECTION

The product uses a professionally designed torque measurement system so as to guarantee the overload protection of equipment. Users can set up the protection values for over-torque at closing and opening directions in terms of specific conditions. When the actual torque borne by the actuator reaches or exceeds the established protection value, the actuator will immediately stop the motor and emit a failure alarm.



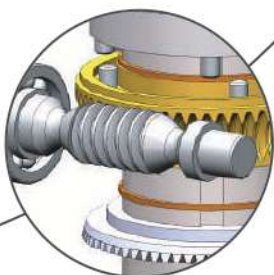
HYDRAULIC IMPACT/SURGE PROTECTION

To prevent hydrodynamic impact or water hammer effect or surge, it is necessary to extend the operating time of the valve. The starting and stopping time of pulse operation which can be independently adjusted can be selected to operate at any part during the valve closing or valve-opening travel so as to effectively reduce valve operating speed.



TRANSIENT REVERSE PROTECTION

When receiving the transient reverse signal, the actuator will automatically delay for a while so as to prevent unnecessary abrasion of valve rod, valve seat and gear transmission part owing to impact load, protecting both the valve and the actuator itself. The halted time period can be set up by users on the LCD interface through the setting device.





PRODUCT INTELLIGENT



MULTI-STATE DISPLAY

CKD series intelligent actuator can provide friendly information for users through the large screen LCD with high contrast and back-light. The information display is concise and easy to understand, which can help users easily find out the valve position, torque and relevant state of the actuator and realize observation and setting clearly even at night. Meanwhile, it is allocated with three LED indicators in the colour of green, yellow and red, indicating the valve position and improving the visibility even in a hostile environment, and enabling users to be clearly informed of the state of the actuator.



ADVANCED INFRARED/ BLUETOOTH COMMUNICATION

CKD series intelligent actuator adopts advanced infrared/ Bluetooth communication technology and can realize human-machine interaction through the liquid crystal window. This type of infrared/ Bluetooth setting device can complete torque setting, switch limit, control and display function adjustment and setting for the actuator, in addition, it provides a help menu to make real-time analysis for the control signal, valve state, operating state and indication state.



IMPROVED AUTOMATIC DETECTION AND DIAGNOSIS

CKD series intelligent actuator is designed with intelligent error detection and alarming function, which can make an on-line diagnosis for 28 types of failures such as default phase, power failure, over-torque in valve-opening process, over-torque in valve-closing process, overheating of electric motor, overcurrent of electric motor and remote signal loss. When the actuator is power on, it will automatically detect the operating circuit so as to guarantee correct operation.



RELIABLE DATA RECORD

CKD series intelligent actuator can communicate with intelligent diagnostic through Bluetooth connection, which is allocated with functions such as detailed parameter acquisition, compilation, batch modification, state feedback and performance intelligent analysis.

FIELD CONTROL

The electric control end cover of the actuator is allocated with two selectors, one is the mode knob which is used for the selection of local/ halted/ remote and can be locked at each position with a padlock; the other is the operating knob which has two positions, indicating "on" and "off" positions of the valve; when the mode knob is at "local" position, users can control the actuator to operate toward opening or closing direction by turning the operating knob to "on" or "off" position respectively. Local control can be selected through an infrared setting device, which includes a dedicated opening, halted and closing button and can be operated within 1 m distance from the actuator.

REMOTE CONTROL

The central control room can connect with the field actuator through an external wire connection and then control the actuator by means of switch value, analogue value and field bus communication. DC Switch value control: Six input terminals are allocated, namely opening, closing, halted/ holding, emergency protection (ESD), opening interlocking and closing interlocking. Remote control input adopts optoelectronic isolation and lightning protection and surge protection, which can withstand 6KV high voltage. The control is realized through the 24V DC power supply provided by the actuator, with the positive pole serving as a switch and the negative pole grounded, or 20-60V DC from external supply or control power supply within 60-220V AC. The remote control can be configured to be holding or jogging. Analog value control: The analogue value proportional controller inside the actuator can help the actuator automatically positioning the valve in terms of analogue current, voltage and potential signal. It can be configured to be locking up, closing and opening when the analogue signal is lost.

BUS CONTROL

The field bus communication board inside the actuator connects and communicates with the remote control room in terms of the standard protocol of the field bus and implements real-time operation in accordance with the commands issued by the remote control room.

EMERGENCY PROTECTION (ESD) CONTROL

Emergency protection (ESD) can be configured to be nonuse, high-level validity or low-level validity, opening or closing of the valve, electric motor temperature protection or automatic bypass arrangement. ESD control will surpass any existing local or remote control signal. ESD can also be configured to surpass local halted or interlocking as required, and it is possible to separate the ESD control system from the operating control.

INTERLOCKING CONTROL

It is possible to set two independent signals for controlling some high safety operations. Under such mode, the actuator can respond and act only when two signals, such as opening signal and opening interlocking signal are provided simultaneously. If the actuator receives only one signal, it will hold the position or be halted. Besides, the opening and closing of the valve can be separately set as interlocking or non-interlocking.

REMOTE ANALOG VALVE POSITION FEEDBACK

The current inside the valve position transmitter can provide a non-contact, internal power supply, and the valve position is proportional to the 4 – 20 mA analogue signal, can choose the minimum signal corresponding to the full close or full open position, and automatically adjust the zero and full. Also can choose the external power supply.



REMOTE CONTACT INDICATION

The actuator is allocated with four lockable passive contacts, namely S1, S2, S3 and S4. Each contact can be independently configured to be any of the following signals through infrared setting device:

- Valve position full opening, full closing or middle position (1 - 99% Opening)
- State valve is opening, is closing, is operating, selecting local halted, selecting local, selecting remote, starting valve opening or valve closing interlinking, starting emergency protection (ECD), low battery.
- Valve alarm over-torque in valve-opening process, over-torque in valve-closing process, stall of electric motor, manual wheel operation of actuator
- Comprehensive alarm loss of actuator internal parameter, overheating of electric motor, overcurrent of electric motor, over-torque in valve opening process, over-torque in valve-closing process, lose of remote analog, stall of electric motor, power failure, error of limit parameter, limit exceeding of valve, position sensor failure, torque transducer failure, ESD signal is effective and each contact can be configured as "normally open" or "normally close" with a rated value of 5A, 250V AC/30V DC.

SUPERVISORY RELAY

An independent relay SO with passive transferable contact can be used to supervise the effectiveness of electric apparatus of the actuator. The rated value of the contact is 5A, 250V AC/30V DC.

- Power supply single phase or multiphase power down
- Loss of control power supply
- Selection of local control
- Selection of local halted
- Overheating of electric motor
- Torque sensor failure
- Over-torque in valve-opening process
- Over-torque in valve-closing process

BACKUP BATTERY

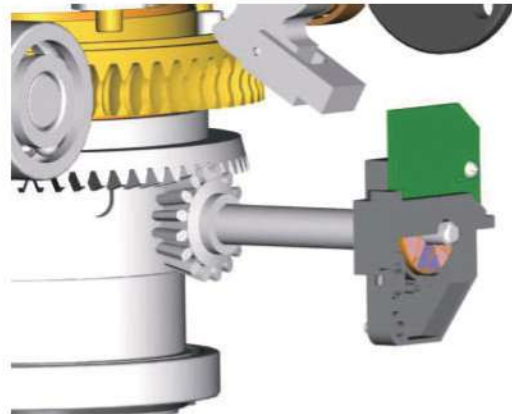
When there is power failure, the backup battery will provide power supply for relevant circuit, which enables the actuator to provide various kinds of information of valve position, and records all the mechanical operation relating to the actuator in the built-in data recorder; the liquid crystal display will continue to display working state, while the LED back-light and valve position indicator will not work. Battery is 9V lithium battery.

FREQUENCY SPEED CONTROL (OPTIONAL)

Frequency speed control technology can start the electric motor at a low speed, reduce starting current and decrease influence on the power grid; besides, it enables the electric motor to reach the target with a gradually decreasing speed when getting close to the target position, which dramatically improves the positioning accuracy of valve and is suitable for various frequency occasions.

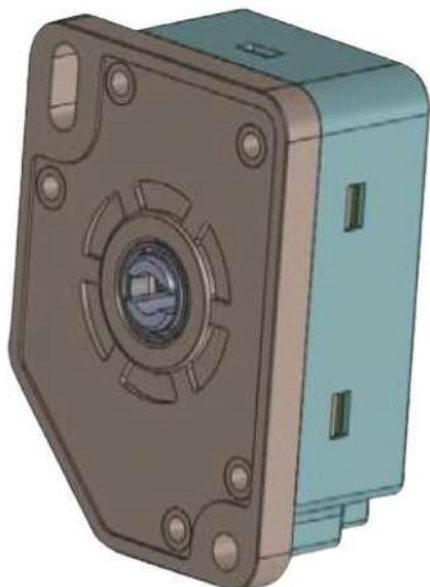
HALL CODING TECHNOLOGY

- A pair of bevel gear is driven at the same time when the output shaft rotates, and a six-antipode magnetic ring is allocated at the end of the bevel gear.
- Two Hall elements, which formulate 90° electric angle, are installed around the magnetic ring, inducing the alternation of magnetic ring field and forming inducing pulse signal, which can accurately acquire many parameters such as displacement, rotation direction and speed. The position determination is carried on all the time and each change is inspected and stored.
- Such technology can accurately determine the rotation direction, valve position and change of position
- Working in a stable and reliable way with high measurement accuracy and strong anti-interference capacity, the technology will not be affected by change of external environment temperature
- Taking data samples in a contactless way, it has a long service life without abrasion.
- This technology is obsolete, the reference is only for supply of spares to existing customers



POSITION SENSOR

ABSOLUTE CODING TECHNOLOGY



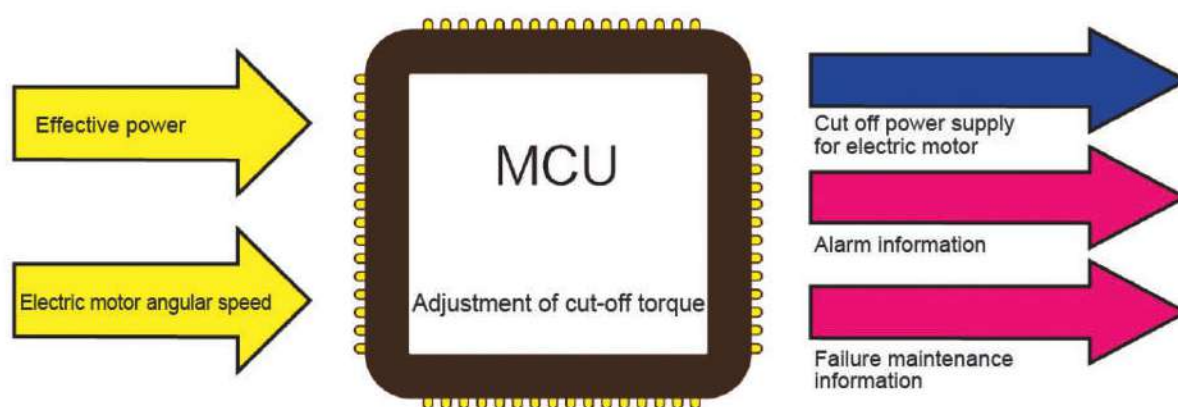
POSITION SENSOR

- The absolute coding technology used by CKD series electric actuator can operate uninterruptedly and is 100% repeatable. The position information provided to the processor is accurate even in the absence of power and battery support
- The single-ring adopts 12-bit counting with an accuracy of 0.08°
- The multi-ring adopts 6-stage gear counting, reaching a maximum counting circles of 4096 (the counting value in 4096 circles rotation of driving sleeve is unique)
- The redundant circuit of the encoder can guarantee that the encoder can work normally even if 50% of the components and parts break down



REPLACING THE MECHANICAL TORQUE SWITCH WITH ELECTRIC TORQUE DETECTION

- The cut-off torque can be set as 1% of step length independently on two directions (forward direction/reverse direction)
- The electric torque detection device includes effective power detection circuit, electric motor angular speed detection circuit, control circuit and CPU microprocessor. During operation, the microprocessor can detect the effective power and angular speed continuously, and calculate the actual torque so as to compare with the preset cut-off torque, once the actual torque exceeds such preset value, CPU will immediately cut off the power supply for electric motor and output failure alarm information to realize over-torque protection goal. Consequently the actuator motor won't be burnt down owing to locked rotor and the valve won't be damaged owing to the over-torque of actuator
- The contactless torque detection needs no mechanical torque switch, saving the trouble of mechanical abrasion and extending service life
- When outputting torque, there is no need to open the cover, because the setup work can be completed easily and conveniently with the help of infrared setting device
- With high accuracy, it won't be affected by factors such as temperature and voltage fluctuation and can completely provide reliable protection for field valve





HUMANIZED DESIGN

The modern actuator can adapt to the special application demand by means of setting and collecting large quantity of parameters. The supervision and diagnosis functions realize the collection of actuator state signal and operating parameter signal.

As for CKD, clear and intuitive user interface facilitates data storage and retrieval. Setup of all parameters of the equipment can be completed through hand-held infrared or Bluetooth setting device. The LCD interface is designed in terms of the visual and operational habits of users and displays torque, valve opening, limit setting and failure alarm information in the form of text and graph.

PASSWORD PROTECTION

Password protection is an important safety feature which can effectively prevent unlicensed user from changing significant equipment information.

1. LCD INTERFACE

The LCD interface is designed in terms of the visual and operational habits of users and displays torque, valve opening, limit setting and failure alarm information in the form of text and graph.

2. INDICATOR

As a visual signal used to display the state information of actuator, the indicator is allocated with strong penetrability in hostile environment and the LED indicator can be clear and recognizable even at night with long distance.

3. INFRARED/BLUETOOTH RECEIVING WINDOW

It can be programmed and configured through hand-held infrared or Bluetooth setting device in terms of customer demand.



The language for configuration will be in English as standard, this can be changed to Chinese with the infrared tool.

4. SELECTION OF CONTROL MODE

The selective switch "remote" "halted" "local" installed on the local operating device can be used to set up remote operation (remote control) or local operation (local control) or halted mode.

5. LOCAL ELECTRIC OPERATION

The operating switch "on"-"off" installed on the local operating device can be used to open or close actuator locally.



COMMUNICATION TECHNOLOGY

Field bus is a development tendency of modern industrial control technology and cost reduction is the most critical factor affecting the wide application of field bus technology. In addition, serial communication in process automation is regarded as the most innovative idea which is used to control field equipment and actuator. The improvement of industrial benefits, such as remote parameter setup or industrial asset management cannot be realized without field bus technology. Allocated with field bus interface, CKD series electric actuator utilizes world-leading technologies.

- Profibus DP
- Modbus RTU
- FF Foundation Fieldbus
- HART

Modbus RTU



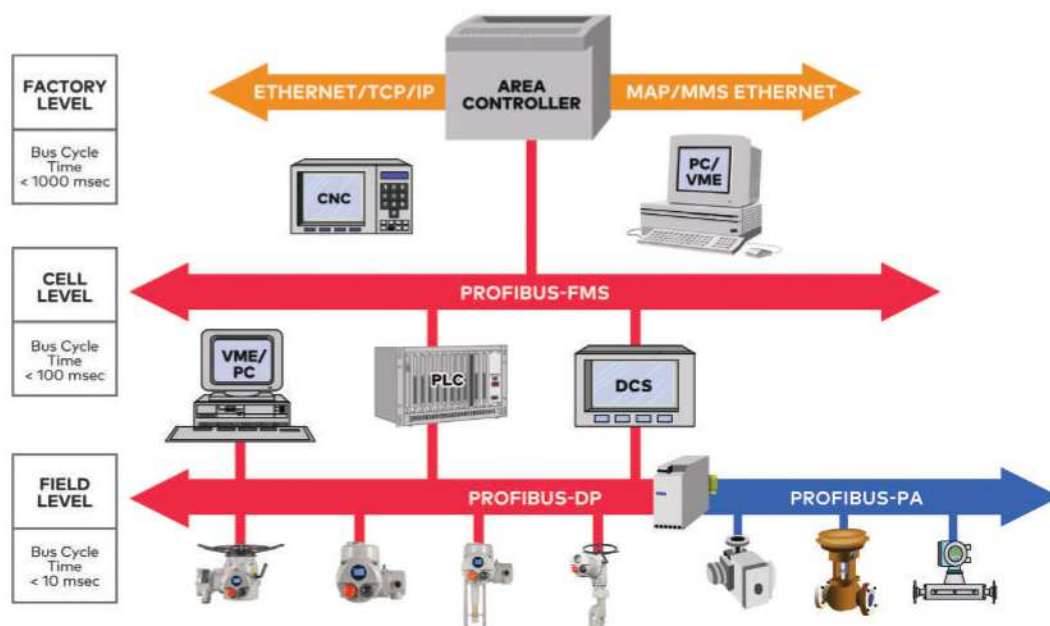
By applying field bus, the actuator replaces decentralized control with centralized control, simplifying system design, improving reliability of system operation and saving large amount of installation and maintenance costs for users.

PROFIBUS

Profibus is a perfect field bus version: Profibus PA is applied in process control area and Profinet is a new generation of automation bus standard for data transmission based on Ethernet and Profibus DP, which is mainly applied in factory, power plant and automation equipment. With simple and durable physical layer (RS-485) and different versions DP-V0 (rapidly circular and determined data exchange) and DP-V1 (non-circular visit of equipment parameter and diagnosis data), Profibus DP is the most ideal solution for automation of modern factory.

- Comply with international standard (www.profibus.com)
- Promote global application
- A large amount of equipment have been installed
- Promote standardization integration within DCS (FDT, EDD)
- Promote extensive equipment selection scope

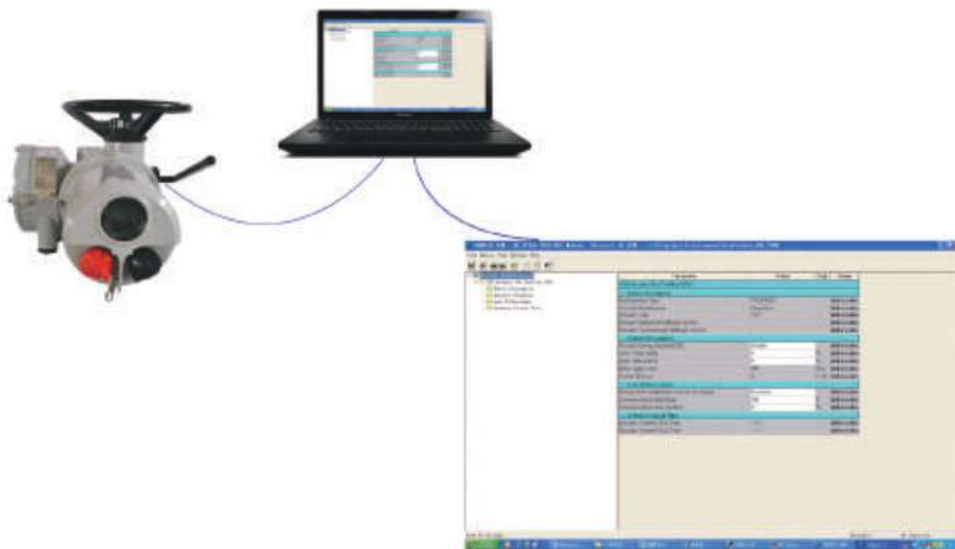
REDES INDUSTRIALES





ACT ELECTRIC ACTUATOR ALLOCATED WITH PROFIBUS DP COMMUNICATION MODULE

- Support Profibus DP-V0 and DP-V1.
- Support high-speed data exchange (as fast as 1.5 Mbit/s) and realize communication with Category 1 master station regularly through DP-V0 service and with Category 2 master station irregularly through DP-V1 service
- It is possible to use PDM tool to download all the parameters, diagnosis data, state information and torque curve of actuator and display them on various function pictures and use PDM tool to operate the actuator directly
- All the setting data (such as cut-off torque, adjustment accuracy and so on) can be displayed on the pictures and uploaded to the actuator through a shortcut key
- Realize DCS integration through FDT or EDD
- The cable length can reach about 10km (the cable length between two actuators can reach 1200m without repeater)
- At most 126 field equipment can be connected
- Allocated with standard redundant linear topological structure



MODBUS

Modbus is a relatively simple but multi-functional field bus protocol which provides all services required by factory automation (such as simple binary information, analog value, equipment parameter or exchange of diagnosis data)

As for factory automation, simple while solid physical layer RS-485 is commonly used.

On the basis of this physical layer, Modbus supports various sorts of message formats (such as Modbus RTU or Modbus TCP) and simplifies the vertical integration in the automation system of host

- International standard
- Simple protocol
- Wide application
- Adequate to complete several simple automation tasks to a great extent



ACT SERIES PRODUCTS ALLOCATED WITH MODBUS COMMUNICATION MODULE

- MODBUS RTU-RS485
- Half-duplex, asynchronous mode, and multi-point communication
- Rapid data exchange with a Baud rate of 1.2k-115.2kbits/s
- STP, serving as transmission media, with a cable length of about 10km (the length between two actuators can reach 1200m without repeater)
- 8-bits data format, 1 stop bit, and no parity check (parity check is optional)
- Connection with as many as 247 sets of equipment
- Modbus (slave station) communication protocol, the address of which can be set up via the menu of actuator
- Redundant module design which can composite bus loop, when disconnection, short circuit or ground fault happens, the equipment can work normally
- Additional parallel communication is optional to guarantee PLC security

FOUNDATION FIELEBUS

Putting aside the traditional master-slave concept, the Foundation Fielebus (FF) allocates tasks to relevant equipment in the automation system. Therefore the FF is not the traditional field bus.

- Information won't be two-way exchanged between field equipment and the host: generally all the information is open to all system members.
- There isn't any center host used to process field bus equipment data.
- The bus communication scheme is controlled by the "Link Active Scheduler" (LAS), ensuring the communication of field equipment.
- Standardized functional module integration passes through DCS

ACT SERIES ELECTRONIC ACTUATOR ALLOCATED WITH FF BUS MODULE

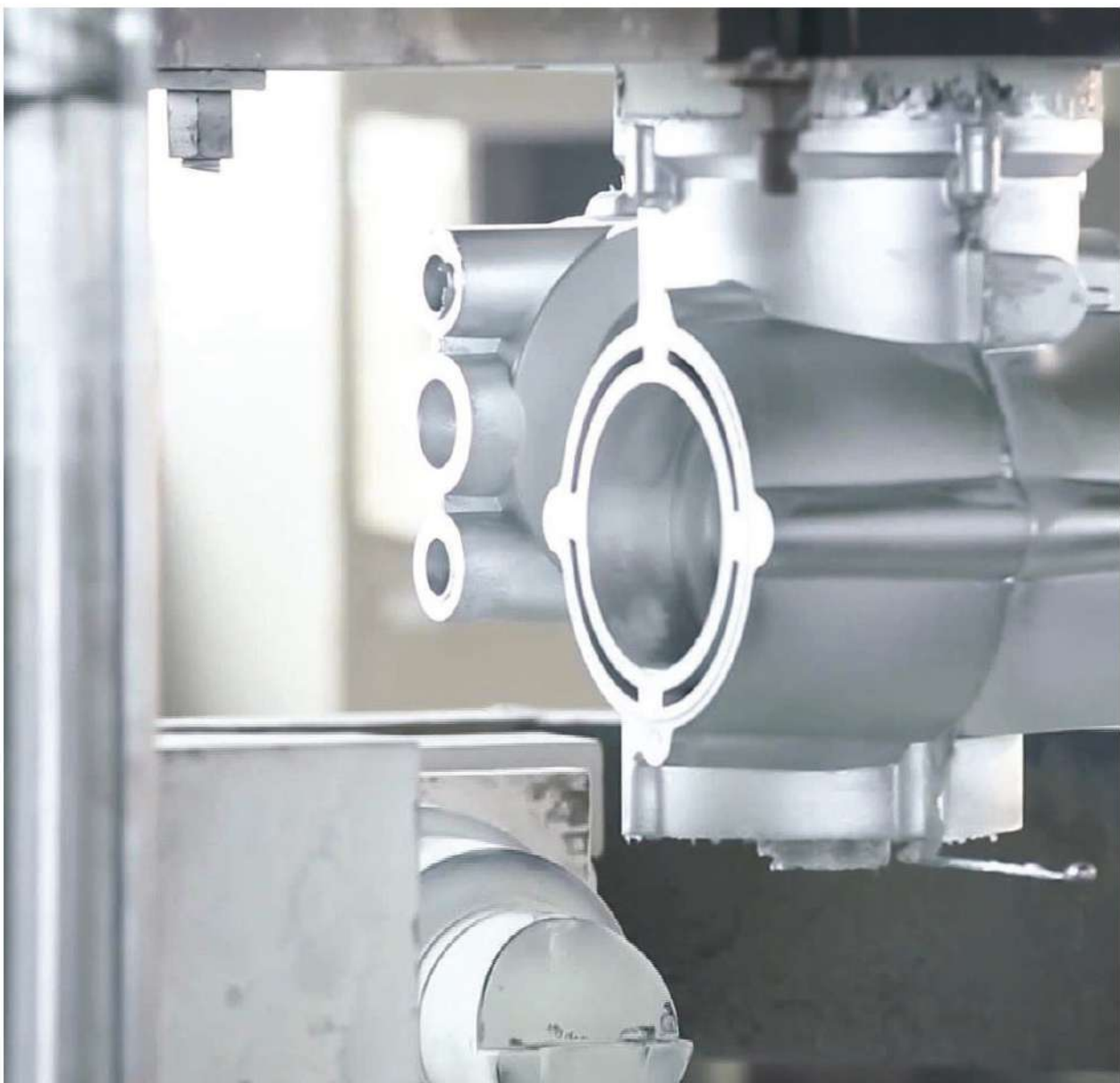
- Support FF-H1 protocol
- The physical layer is IEC61158-2, 2
- The cable specification is A (such as Belden 3076F)
- Data exchange rate is 31.25kbit/s, and the typical periodic time is between 40ms and 2s, depending on the number of equipment
- At most 31 sets of actuators can be connected on each circuit without repeater (with a maximum circuit length of 1900m) and at most 4 sets of repeaters can be connected on each circuit
- As many as 240 sets of equipment can be connected
- HSR bus is connected with DCS
- Connecting device is linked with HSE-H1 bus



BLUETOOTH COMMUNICATION CONTROL (OPTIONAL)

As an alternative for infrared communication, Bluetooth technology is adopted by Acttec Malaysia. Computer or PDA which installs CKD dedicated Bluetooth communication software can realize wireless communication with the actuator:

- The communication is more convenient: When using Bluetooth communication, users needn't put the computer in front of the actuator, instead, they can move the computer at will without worrying about the negative influence on communication effect
- The setup is easier: It is possible to complete torque setting and adjustment and setting of switch limit, control and display function of actuator under any working condition, call out help menu and carry out real-time analysis for the control signal, valve state, operating state and indication state
- The application is simpler: Computer or PDA which uses Bluetooth communication can automatically find out all the actuators within 10m. Each actuator is allocated with specific number and password



INTELLIGENT ELECTRIC ACTUATOR

PRODUCT SELECTION



THREE PHASE PERFORMANCE SUMMARY (415V/50HZ)

ACT Series Multi-Turn ON-OFF Electric Actuator Performance Data Sheet (415V/50Hz)



Model	Output		Power (kW)	Rated Current (A)	(ISO5210/JB2920)
	Rated Torque (Nm)	Rpm (rev/min)			
ACT4	40	24	0.10	1.10	F10/2
ACT10	100	24	0.25	2.50	F14/2/2
	80	36	0.30	2.60	
	60	48	0.40	2.70	
	50	72	0.45	3.00	
	40	96	0.45	3.20	
ACT16	160	24	0.40	2.60	
	120	36	0.45	3.00	
	100	48	0.50	3.50	
	80	72	0.65	4.20	
	60	96	0.80	4.80	
ACT25	250	24	0.63	2.80	
	230	36	0.83	3.30	
	200	48	1.00	3.60	
	180	72	1.36	4.10	
	160	96	1.60	4.50	
ACT40	400	24	1.00	4.40	F16/3/4
	360	36	1.30	5.50	
	320	48	1.50	6.80	
	280	72	1.88	7.30	
	250	96	2.00	7.60	
	200	144	2.26	8.30	
ACT60	600	24	1.50	5.70	
	500	36	1.88	7.00	
	450	48	2.25	7.60	
	400	72	2.64	8.10	
	300	96	3.00	8.40	
	250*	144	3.76	9.20	
ACT100	1,000	24	2.50	11.50	F25/4
	900	36	3.40	13.50	
	850	48	4.00	14.50	
	750	72	4.80	15.00	
	650	96	6.00	16.00	
	500*	144	7.50	17.50	
	400*	192	8.00	18.50	



ACT Series Multi-Turn ON-OFF Electric Actuator Performance Data Sheet (380V/50Hz)

Model	Output		Power (kW)	Rated Current (A)	(ISO5210/JB2920)
	Rated Torque (Nm)	Rpm (rev/min)			
ACT120	1,200	24	3.00	12.50	F25/4
	1,100	36	3.80	14.00	
	1,000	48	4.50	16.00	
	850	72	6.00	17.00	
	700	96	7.00	18.00	
	550*	144	8.00	19.00	
	500*	192	9.00	20.00	
ACT150	1,500	24	3.80	15.00	F30/7
	1,300	36	4.90	21.00	
	1,100	48	5.50	22.00	
	900	72	6.70	23.00	
	750	96	7.50	25.00	
	650*	144	9.80	28.00	
	550*	192	11.00	30.00	
ACT180	1,800	24	4.50	21.00	
	1,500	36	5.70	22.00	
	1,350	48	6.80	23.50	
	1,200	72	9.00	25.00	
	1,100	96	10.00	26.00	
	900*	144	13.00	30.00	
	800*	192	14.00	32.00	
ACT250	2,500	24	6.00	25.00	
	2,200	36	8.30	30.00	
	1,800	48	9.00	35.00	
	1,500	72	11.00	40.00	
	1,350	96	13.00	45.00	
	1100*	144	15.00	60.00	
ACT300	900*	192	17.00	60.00	
	3,000	24	7.50	30.00	
	1,800	96	15.00	60.00	
	1,500	144	18.00	65.00	
	1250*	192	20.00	70.00	

ACT Series Combined Multi-Turn ON-OFF Electric Actuator Performance Data Sheet (415V/50Hz)

Actuator Model		Rated Torque (Nm)	Output Speed (rev/min)	Ratio	Motor Power (kW)	Rated Current (A)	Flange (ISO5210)/ (JB2920)
Combined Model							
ACT180	ACT60 + IB8	1,600	12	4:1	2.25	7.6	F25
		1,600	16	6:1	3.0	8.4	
		1,800	18	8:1	3.76	9.2	
ACT250	ACT100 + IB8	2,500	16	8:2	4.0	14.5	
		2,000	24	3:1	4.8	15.0	
		1,800	32	3:1	6.0	16.0	
		2,500	24	4:1	6.0	16.0	
		1,800	36	4:1	7.5	17.5	
ACT350	ACT100 + IB10	3,500	16	6:1	6.0	16.0	F25/F30
		3,000	12	4:1	4.0	14.5	
		2,700	18	4:1	4.8	15.0	
		2,700	24	6:1	7.5	17.5	
ACT500	ACT120 +IB10 ACT120 + IB10R	5,000	12	8:1	7.0	18.0	
		4,800	14.4	10:1	8.0	19.0	
		4,600	16	12:1	9.0	20.0	
		4,000	18	8:1	8.0	19.0	
ACT800	ACT150 + IB12R	8,400	10.7	18:1	11.0	30.0	F30/F35
		7,600	8	12:1	7.5	25.0	
		6,600	12	12:1	9.8	28.0	
		5,600	16	12:1	11.0	30.0	
	ACT250 + IB12	8,000	18	8:1	15.0	50.0	
		7,200	16	6:1	13.0	45.0	
		6,500	24	8:1	17.0	60.0	
ACT1000	ACT250 + IB14R	10,000	12.8	15:1	17.0	60.0	F35/F40
		9,350	14.4	10:1	15.0	50.0	
ACT1500	ACT300 + IB14R	15,300	12.8	15:1	20.0	70.0	
		12,800	14.4	10:1	18.0	65.0	
ACT2000	ACT300 + QST40	20,000	9	16:1	18.0	65.0	F40
		18,000	12	16:1	20.0	70.0	
ACT2500	ACT300 + QST40	25,000	7.2	20:1	18.0	65.0	
			9.6	20:1	20.0	70.0	



ACT Series Multi-Turn Electric Actuator Performance Data Sheet (220V/50Hz)

Model	Regulating Torque (Nm)	Speed (rev/min)	Motor Power (kW)	Rated Current (A)	Flange (ISO5210)/ (JB2920)
ACT10	60	24	0.15	3.6	F10/2
ACT25	150	24	0.37	7	F14/2/3
	130	48	0.65	7.50	
ACT40	200	24	11	40.00	F14/3/4
	180	48	13	45.00	
	120	72	15	50.00	
ACT60	250	24	17	60.00	
	210	48	7.5	30.00	
	150	72	15	60.00	
ACT80	300	24	18	65.00	
	230	48	20	70.00	

ACT Series Multi-Turn Adjustable Electric Actuator Performance Data Sheet (Suitable for Adjusting Frequency 600 - 1200 times/hour)

Model	Regulating Torque (Nm)	Maximum Torque (Nm)	Speed (rev/min)	Motor Power (kW)	Rated Current (A)	Flange (ISO5210)/ (JB2920)
ACT4	20	40	18	0.10	0.50	F10/2
	20	40	24	0.10	0.50	
	15	30	48	0.25	1.10	
ACT10	50	100	18	0.25	1.10	
	50	100	24	0.25	1.10	
	40	80	48	0.60	2.10	
ACT16	80	160	18	0.40	2.70	F14/2/3
	80	160	24	0.40	2.70	
	70	140	36	0.45	3.00	
	60	120	48	0.50	3.30	
ACT25	125	250	18	0.65	2.80	
	125	250	24	0.65	2.80	
	110	220	36	0.80	4.60	F16/3/4
	100	200	48	1.00	5.50	
ACT40	80	160	72	1.35	7.50	
	200	400	18	1.00	5.50	
	200	400	24	1.00	5.50	
	180	360	36	1.50	6.20	
	150	300	48	2.10	7.00	
ACT60	100	200	72	2.50	8.00	F25/4/5
	300	600	18	1.50	5.80	
	300	600	24	1.50	5.80	
	260	520	36	2.00	6.50	
	230	450	48	2.25	7.60	
ACT100	150	300	72	3.00	8.20	
	500	1,000	24	2.50	11.50	F25/4/5
	450	900	36	3.40	13.50	
	400	800	48	4.00	14.50	
		700	72	5.30	15.00	



ACTJ Series Integral Quarter-Turn Electric Actuator Performance Data Sheet (415V 50Hz)



Model	Rated Torque (Nm)	Travel Time (s)	Motor Power (W)	Rated Current (A)	Flange (GB12223/ISO5211)
ACTJ5	50	25	13	0.3	F07/F10
ACTJ10	100	25	25	0.6	
	80	13	25	0.8	
ACTJ16	160	25	40	0.9	F10/F12
ACTJ20	200	25	45	1.1	
ACTJ30	300	25	50	1.1	
	240	13	50	1.2	
ACTJ40	400	25	60	1.2	
ACTJ50	500	25	90	1.4	
ACTJ60	600	25	120	1.4	F10/F12
	500	13	120	1.8	
ACTJ80	800	25	150	1.8	
ACTJ100	1,000	25	180	2.1	
	800	13	180	2.4	
ACTJ150	1,250	25	220	2.4	F10/F12
	1,000	13	220	2.8	
ACTJ200	1,800	25	250	3.0	
	1,400	13	250	3.3	F14/F16

ACTJ Series Integral Quarter-Turn Electric Actuator Performance Data Sheet (415V 50Hz)

Model	Rated Torque (Nm)	Travel Time (s)	Motor Power (kW)	Rated Current (A)	Flange (GB12223/ISO5211)
ACTJII5	50	25	45	0.3	F07/F10
ACTJII10	100	25	45	0.6	
	200	25	45	0.9	
ACTJII20	120	13	45	1.0	F10/F12
	80	5	45	0.8	
ACTJII30	300	25	90	1.1	
	150	10	120	1.3	
ACTJII40	400	25	90	1.2	
	200	13	90	1.3	
ACTJII50	500	25	90	1.4	F10/F12
	350	13	90	1.2	
	250	5	120	1.5	
ACTJII60	600	29	140	1.7	
	800	29	140	2.0	
ACTJII80	700	15	140	1.4	F12/F14
	450	5	180	1.6	
	1,000	29	180	2.4	
ACTJII100	800	15	100	2.0	
		5	200	1.7	

ACTJ Series Integral Quarter-Turn Electric Actuator Performance Data Sheet (220V 50Hz)

Model	Rated Torque (Nm)	Travel Time (s)	Motor Power (kW)	Rated Current (A)	Flange (GB12223/ISO5211)
ACTJII10	80	25	45	0.3	F07/F10
ACTJII20	100	25	45	0.6	
ACTJII40	200	25	90	0.9	F10/F12
ACTJII80	400	29	140	1.0	F12/F14
ACTJII100	750	29	180	0.8	



ACT Combined Quarter-Turn Electric Actuator Performance Data Sheet (415V 50Hz)

Model	Rated Torque (Nm)	Speed (rev/min)	Travel Time (s)	Gearbox Ratio	Sleeve Diameter	Weight (kg)	Flange (GB12223/ISO5211)
ACT10 + JW80	1,200	24	25	40	42	58	F14
ACT16 + JW80	1,200	48	13	40	42	60	
	1,000	72	9	40	42	60	
ACT10 + JW100	2,100	24	60	70	50	82	F16
	1,680	36	29	70	50	82	
	2,550	36	29	70	50	85	
ACT16 + JW100	2,100	48	22	70	50	85	
	1,500	72	15	70	50	95	
	3,300	48	60	99	50	102	
ACT25 + JW100	3,000	96	10	70	50	102	F25
ACT16 + JW125	3,360	24	44	70	60	125	
	2,550	36	29	70	60	125	
	4,200	48	44	140	60	136	
ACT25 + JW125	3,000	72	29	140	60	136	
	4,200	48	22	70	60	143	
	3,800	72	15	70	60	143	
ACT16 + JW140	3,360	96	10	70	60	136	
	6,000	24	76	122	60	136	
	5,250	24	44	70	60	145	
ACT25 + JW140	4,800	36	29	70	60	145	
	6,000	48	31	99	60	155	
	5,350	72	21	99	60	155	
ACT16 + JW160	4,800	96	15	99	60	155	F25/F30
	8,000	36	92	221	72	195	
	10,000	24	88	140	72	208	
ACT25 + JW160	9,600	36	58	140	72	208	
	8,400	48	44	140	72	208	
	7,560	72	29	140	72	208	
ACT40 + JW160	10,000	48	56	180	72	213	
ACT60 + JW160	10,000	24	44	70	72	225	
	9,500	48	22	70	72	228	
	13,500	24	113	180	100	335	
ACT25 + JW200	13,500	48	69	221	100	335	
	13,500	96	44	280	100	335	
	16,500	24	138	221	100	366	
ACT40 + JW200	19,500	36	117	280	100	335	F30/F35
	15,000	72	58	280	100	228	
	18,900	48	44	140	100	366	
ACT60 + JW200	16,800	72	29	140	100	366	
	21,000	36	58	140	120	366	
	21,000	96	35	221	120	378	
ACT60 + JW250	23,400	24	81	130	120	468	
	30,000	36	86	205	120	468	
	27,600	48	65	205	120	468	
ACT100 + JW250	30,000	96	25	156	120	556	
	35,000	24	128	205	120	468	
	35,000	48	82	260	120	468	
ACT60 + JW280	39,000	36	108	260	160	805	F35/F40
	43,200	48	100	320	160	805	
	35,000	96	60	384	160	805	
ACT100 + JW280	40,000	48	48	154	160	842	
	40,000	96	32	202	160	842	
	45,000	24	162	260	180	805	
ACT60 + JW315	45,000	72	80	384	180	805	
	45,000	144	62	602	180	805	
	48,000	36	133	320	180	805	
ACT100 + JW315	51,800	48	120	384	180	805	
	45,000	72	42	202	180	842	
	50,000	48	63	202	180	842	
	50,000	96	41	260	180	893	

Model	Rated Torque (Nm)	Speed (rev/min)	Travel Time (s)	Gearbox Ratio	Sleeve Diameter	Weight (kg)	Flange (GB12223/ISO5211)
ACT100 + JW315	51,800	48	120	384	180	805	F35/F40
	45,000	72	42	202	180	842	
	50,000	48	63	202	180	842	
	50,000	96	41	260	180	893	
ACT60 + JW400	57,600	24	200	320	180	805	F35/40
	57,600	36	160	384	180	805	
	60,000	72	108	512	180	805	
	65,000	24	240	384	180	805	
	65,000	48	160	512	180	805	
ACT100 + JW400	55,000	36	84	202	180	842	F35/40
	58,000	72	54	260	180	893	
	60,000	24	126	202	180	842	
	65,000	48	81	260	180	893	
ACT60 + JW400	57,600	24	200	320	180	805	F35/40
	57,600	36	160	384	180	805	
	60,000	72	108	512	180	805	
	65,000	24	240	384	180	805	
	65,000	48	160	512	180	805	
ACT100 + JW400	55,000	36	84	202	180	842	F35/40
	58,000	72	54	260	180	893	
	60,000	24	126	202	180	842	
	65,000	48	81	260	180	893	
ACT100 + JW450	72,600	36	112	269	180	1,136	F40
	76,500	72	71	340	180	1,188	
	80,000	24	168	269	180	1,136	
	83,000	96	66	425	180	1,188	
	85,000	48	106	340	180	1,188	
	90,000	36	142	340	180	1,188	
ACT100 + JW500	102,000	24	215	340	180	1,188	F40
	108,000	48	135	425	180	1,188	
	115,000	36	178	425	180	1,188	
	115,000	72	106	510	180	1,188	
	125,000	24	266	425	180	1,188	
	125,000	48	160	510	180	1,188	
	132,000	96	106	680	180	1,188	
ACT100 + JW550	152,000	24	320	510	220	1,790	F48
	152,000	48	190	595	220	1,790	
	152,000	72	145	680	220	1,790	
	160,000	36	250	595	220	1,790	
	160,000	144	115	1,063	220	1,790	
	165,000	72	155	740	220	1,790	
	165,000	96	135	850	220	1,790	
ACT100 + JW600	175,000	48	215	680	220	1,790	F48
	185,000	36	285	680	220	1,790	
	185,000	144	130	1,254	220	1,790	
	192,000	72	180	850	220	1,790	
	192,000	96	155	986	220	1,790	
	200,000	36	310	740	220	1,790	
	205,000	96	170	1,063	220	1,790	
	205,000	144	145	1,360	220	1,790	
ACT100 + JW650	215,000	48	270	850	220	1,790	F48/F60
	225,000	96	180	1,156	220	1,790	
	230,000	36	355	850	220	1,790	
	240,000	72	225	1,063	220	1,790	
	250,000	48	310	986	220	1,790	
	250,000	72	245	1,156	220	1,790	
	250,000	96	200	1,254	220	1,790	
ACT100 + JW700	270,000	48	335	1,063	220	1,790	F48/F60
	282,000	72	265	1,254	220	1,790	
	300,000	72	280	1,360	220	1,790	
	300,000	144	215	2,040	220	1,790	
ACT100 + JW800	400,000	72	340	1,632	280	2,945	F60
ACT100 + JW900	500,000	48	510	1,632	280	3,120	



ACT Combined Quarter-Turn Electric Actuator Performance Data Sheet (220V 50Hz)

Model	Rated Torque (Nm)	Speed (rev/min)	Travel Time (s)	Gearbox Ratio	Sleeve Diameter	Weight (kg)	Flange (GB12223/ISO5211)
ACT10 + JW80	1,200	24	44	70	42	58	F14
ACT25 + JW100	2,500	24	44	70	50	102	F16
ACT25 + JW125	4,000	24	62	99	60	155	F25
ACT25 + JW140	6,000	24	88	140	60	155	F25
ACT25 + JW1160	8,400	48	70	221	72	213	F25
ACT60 + JW160	10,000	24	88	140	72	235	F25



PERFORMANCE SUMMARY (ADJUSTING FREQUENCY 600 - 1200 TIMES/HOUR)

ACTM Series Linear Electric Actuator Performance Data Sheet (415V 50Hz)

Model	Output Speed RPM	18	24	36	48
ACTM4	Drive Screw Diameter/Lead mm	24 X 4			
	Maximum Linear Stroke mm	100			
	Flange Model (ISO5210)	F10			
	Adjust Thrust kN	4	4	4	3
	Linear Speed mm/sec	1.2	1.6	2.4	3.2
	Rated Closing Thrust kN	8	8	8	6
ACTM10	Drive Screw Diameter/Lead mm	24 X 4			
	Maximum Linear Stroke mm	100			
	Flange Model (ISO5210)	F10			
	Adjust Thrust kN	10	10	8	6
	Linear Speed mm/sec	1.2	1.6	2.4	3.2
	Rated Closing Thrust kN	16	16	14	12
ACTM16	Drive Screw Diameter/Lead mm	26 X 5			
	Maximum Linear Stroke mm	100			
	Flange Model (ISO5210)	F10			
	Adjust Thrust kN	16	16	14	12
	Linear Speed mm/sec	1.5	2	3	4
	Rated Closing Thrust kN	40	35	32	24
ACTM25	Drive Screw Diameter/Lead mm	26 X 5			
	Maximum Linear Stroke mm	150			
	Flange Model (ISO5210)	F10			
	Adjust Thrust kN	25	25	22	20
	Linear Speed mm/sec	1.5	2	3	4
	Rated Closing Thrust kN	60	55	48	40
ACTM40	Drive Screw Diameter/Lead mm	32 X 6			
	Maximum Linear Stroke mm	150			
	Flange Model (ISO5210)	F10			
	Adjust Thrust kN	40	40	35	30
	Linear Speed mm/sec	1.5	2	3	4
	Rated Closing Thrust kN	85	80	65	56
ACTM60	Drive Screw Diameter/Lead mm	36 X 6			
	Maximum Linear Stroke mm	250			
	Flange Model (ISO5210)	F14			
	Adjust Thrust kN	60	60	55	45
	Linear Speed mm/sec	1.8	2.4	3.6	4.8
	Rated Closing Thrust kN	118	110	95	80
ACTM100	Drive Screw Diameter/Lead mm	36 X 6			
	Maximum Linear Stroke mm	250			
	Flange Model (ISO5210)	F14			
	Adjust Thrust kN	100	100	80	65
	Linear Speed mm/sec	1.8	2.4	3.6	4.8
	Rated Closing Thrust kN	180	180	150	120
ACTM120	Drive Screw Diameter/Lead mm	38 X 8			
	Maximum Linear Stroke mm	250			
	Flange Model (ISO5210)	F16			
	Adjust Thrust kN	120	120	100	90
	Linear Speed mm/sec	2.4	3.2	4.8	6.4
	Rated Closing Thrust kN	240	240	200	180



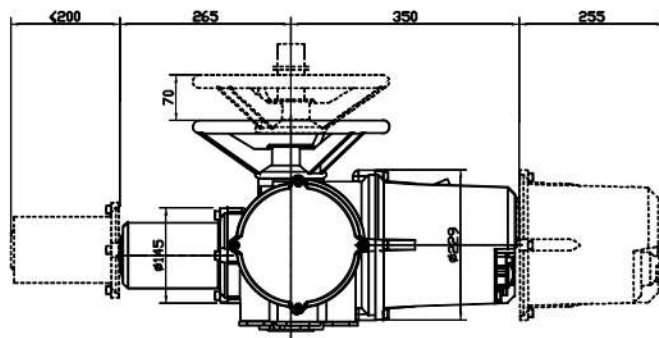
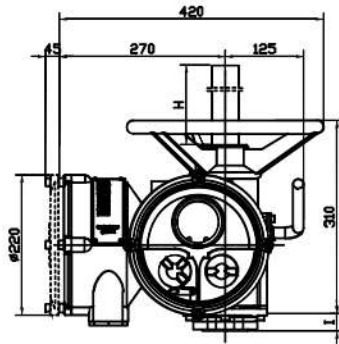
ACTM Series Linear Electric Actuator Performance Data Sheet (415V 50Hz)

Model	Output Speed RPM	18	24	36	48
ACTM4	Drive Screw Diameter/Lead mm	26 X 5			
	Maximum Linear Stroke mm	100			
	Flange Model (ISO5210)	F10			
	Adjust Thrust kN	6	6		
	Linear Speed mm/sec	1.2	1.6		
	Rated Closing Thrust kN	15	13		
ACTM10	Drive Screw Diameter/Lead mm	26 X 5			
	Maximum Linear Stroke mm	100			
	Flange Model (ISO5210)	F10			
	Adjust Thrust kN	10	10		
	Linear Speed mm/sec	1.2	1.6		
	Rated Closing Thrust kN	24	24		
ACTM16	Drive Screw Diameter/Lead mm	32 X 6			
	Maximum Linear Stroke mm	230			
	Flange Model (ISO5210)	F14			
	Adjust Thrust kN	16	16	12	12
	Linear Speed mm/sec	1.5	2	3	4
	Rated Closing Thrust kN	32	32	24	24
ACTM25	Drive Screw Diameter/Lead mm	32 X 6			
	Maximum Linear Stroke mm	230			
	Flange Model (ISO5210)	F14			
	Adjust Thrust kN	25	25	20	20
	Linear Speed mm/sec	1.5	2	3	4
	Rated Closing Thrust kN	50	50	40	40
ACTM40	Drive Screw Diameter/Lead mm	36 X 6			
	Maximum Linear Stroke mm	250			
	Flange Model (ISO5210)	F16			
	Adjust Thrust kN	30	30	25	25
	Linear Speed mm/sec	1.8	2.4	3.6	4.8
	Rated Closing Thrust kN	65	65	55	55
ACTM60	Drive Screw Diameter/Lead mm	36 X 6			
	Maximum Linear Stroke mm	250			
	Flange Model (ISO5210)	F14			
	Adjust Thrust kN	40	40	30	30
	Linear Speed mm/sec	1.8	2.4	3.6	4.8
	Rated Closing Thrust kN	75	75	65	65



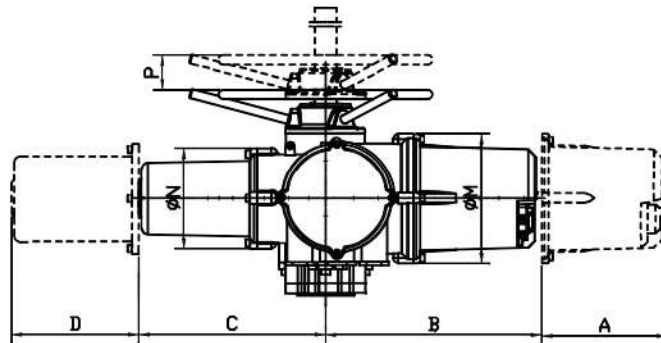
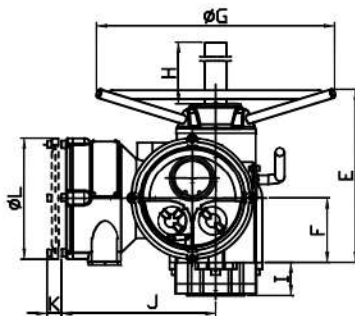
ELECTRIC ACTUATOR APPEARANCE AND CONNECTION DIMENSION

CKD Series Multi-turn Electric Actuator Appearance and Connection Dimension (CKD4-CKD16)



Model	Standard	Flange	I	H (Customized According to Stem)
CKD4/CKD16	GB/T 12222 ISO 5210	F10	Torque Mode 40 Thrust Mode 55	120.250.500
	JB2920	2	70	120.250.500

CKD Series Multi-turn Electric Actuator Appearance and Connection Dimension (CKD25-CKD90)

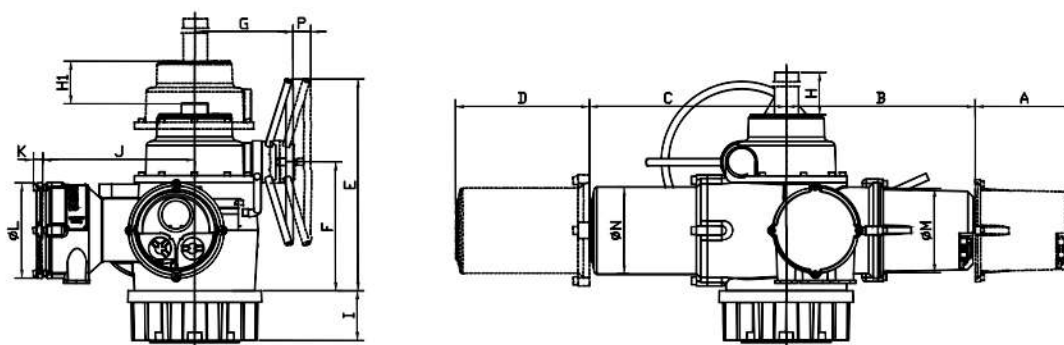


Model	A	B	C	D	E	F	P	J	K	<PL	<PM	<PN	<PG
CKD25	255	385	340	240	315	120	60	280	45	214	229	178	440
CKD40-CKD60	255	400	360	260	365	125	60	300	45	214	229	196	800
CKD100	255	430	445	300	450	150	85	350	45	214	229	196	730

Model	Standard	Flange	I	H (Customized According to Stem)
CKD25	GB/T 12222 ISO 5210	F14	Torque Mode 60 Thrust Mode 80	120.250.500
		2	75	
	JB2920	3	95	
CKD40-CKD60	GB/T 12222 ISO 5210	F16	Torque Mode 60 Thrust Mode 80	120.250.500
		3	70	
	JB2920	4	110	
CKD100-CKD120	GB/T 12222 ISO 5210	F25	Torque Mode 60 Thrust Mode 80	120.250.500
		ZK-4-100	130	
	JB2920	ZK-5-100	130	



CKD Series Multi-turn Electric Actuator Appearance and Connection Dimension (CKD100-CKD300)

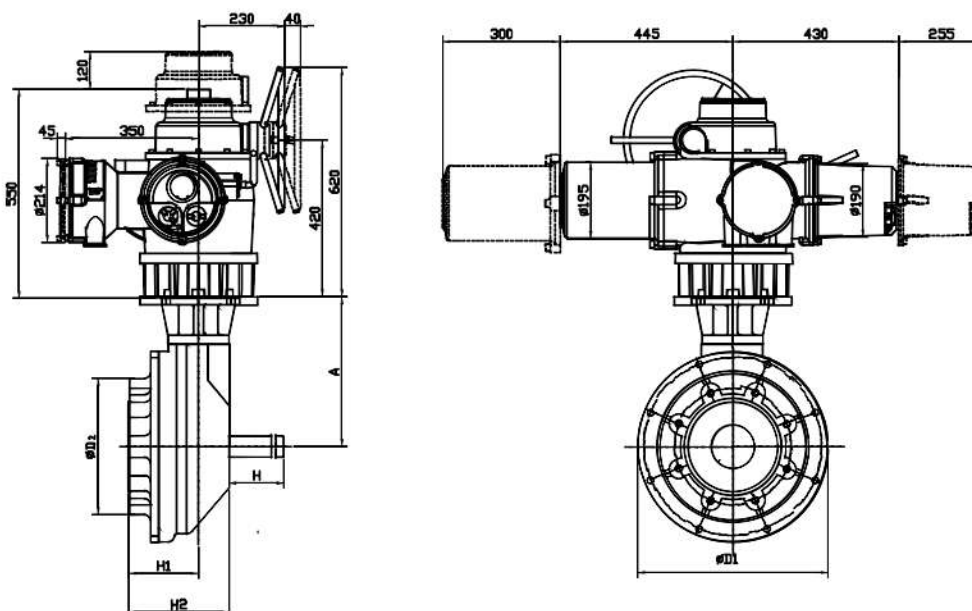


Model	A	B	C	D	E	F	P	J	K	G	H	<PL	<PM	<PN
CKD100-CKD120	255	430	445	300	500	300	40	350	45	230	120	214	190	195
CKD150-CKD300	255	520	550	320	600	380	60	350	45	435	100	214	190	220

Model	Standard	Flange	I	H (Customized According to Stem)
CKD150 CKD180 CKD250 CKD300	GB/T 12222 ISO 5210	F25	Torque Mode 0 Thrust Mode 105	120 250 500 1000
		F30	Torque Mode 0 Thrust Mode 105	120 250 500 1000
	JB2920	7	Torque Mode 0 Thrust Mode 105	120 250 500 1000

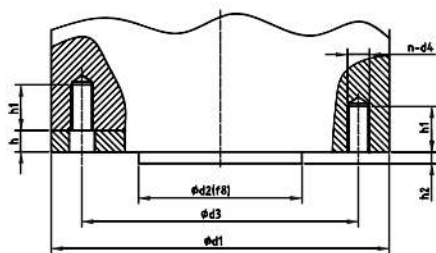
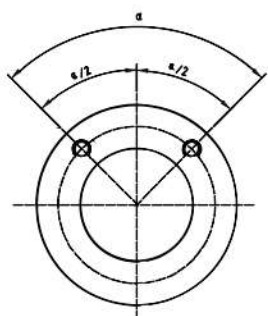
ELECTRIC ACTUATOR APPEARANCE AND CONNECTION DIMENSION

CKD Series Multi-turn Electric Actuator Appearance and Connection Dimension (CKD500-CKD1000)



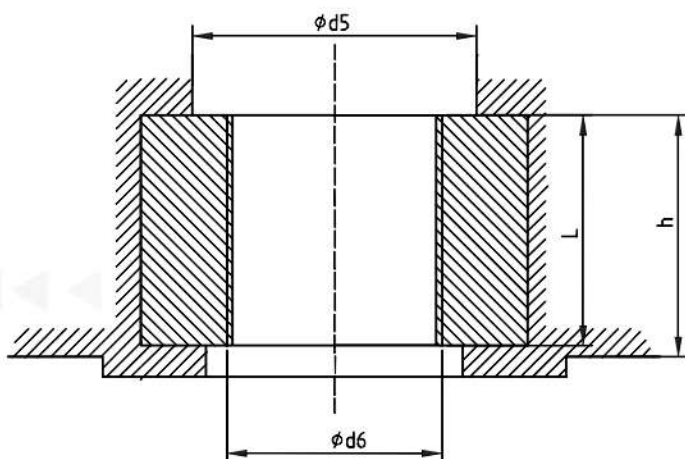
Model	A	D1	D2	H1	H2	H (Customized According to Stem)
CKD500	423	495	298	209	280	120 250 500
CKD800	422	572	298	244	358	120 250 500
CKD1000	423	590	406	264	355	120 250 500

CKD Series Multi-turn Electric Actuator Appearance and Connection Dimension (GB12222/ISO5210)



Flange					$\alpha/2$			
F10-F16					45°			
F25-40					22.5°			
Flange	D1	D2	D3	D4	N	H2	H1	H
F10	125	70	102	M10	4	3	20	11.5
F14	175	100	140	M16	4	4	25	17
F16	210	130	165	M20	4	5	30	16
F25	300	200	254	M16	8	4	30	
F30	350	230	298	M20	8	4	30	
F35	415	260	356	M30	8	5	45	
F40	475	300	406	M36	8	8	54	

Transfer Torque and Thrust Drive Shaft sleeve Dimension



Flange	F10	F14	F16	F25	F30
d5	40	42	65	75	110
d6 (max)	32	34	60	68	80
L	61	79	90	116	157
h	62	80	93	117	158



GEARBOX

The gearbox (gearbox or worm box) is designed from the customer's application concept. In the industrial valve control, the valve opening and closing can be operated manually or electrically. The gearbox is determined according to the size of the valve to ensure the reasonableness of the on-site valve opening and closing time. The gearbox has a fault protection function: when the applied torque exceeds the locked-rotor torque of the actuator, the internal parts of the gearbox will fail (like a fuse), so that the gearbox will output this excessive torque to the external housing parts. The shell ruptures to prevent the actuator from falling, causing injury to the operator or damage to the installation project. The gearbox transmission mechanism has sufficient rigidity to withstand the required torque, to ensure the stability of the valve in opening or closing, and to ensure that the valve plate can stably stay at any opening position. The transmission mechanism is self-locking, and no creeping or trembling is allowed in any position between fully open and fully closed valve plate. The casing of the transmission mechanism adopts nodular cast iron (QT450-10) as a material, a complete sealed type, and the protection level is IP67. The performance and the material of the gearbox equipped with the adjustable actuator meet the frequent adjustment conditions including quarter-turn gearbox and multi-turn gearbox.

QUARTER-TURN GEARBOX

It adopts the worm gear transmission method, also called the worm gear box, with a curved shape, which forms a perfect whole with the actuator and has a certain aesthetic effect. The built-in transmission part is coated with high-efficiency and environmentally friendly grease, which effectively improves the mechanical efficiency of the product. No special processing is required to control the valve from the open position to the closed position. The input and output connecting flanges conform to the ISO5211 standard, and the torque range is from 600Nm to 500,000Nm. Each specification can provide multiple transmission ratio sharing options. It is suitable for ball valves, plug valves and damper flaps. It is the best choice for process regulation and control in petrochemical, electric power and metallurgy.



FEATURE:

- Complete sealed transmission
- Gear ratio can be selected for any input ratio, widely used
- Comply with the IP67 sealing protection level specified by EN60529
- Reliable operation stability and long-term maintenance-free guarantee
- The movable drive shaft sleeve is flexible and easy to disassemble
- Built-in grease to improve service life and seal
- The worm support angle is fully self-locking
- 0 – 900 mechanical limit
- Suitable for working environment -400C – +1200C
- Convenient processing and matching connection size
- Convenient processing and matching connection size

MULTI-TURN GEARBOX

It adopts the bevel gear transmission mode, also called the bevel gear gearbox. The shape is curved, and it forms a perfect whole with the actuator, and has certain aesthetic effect. The built-in transmission part is coated with efficient and environmentally friendly grease, which effectively improves the mechanical efficiency of the product. No special processing is required to control the valve from the open position to the closed position. The input and output connecting flanges conform to the ISO5211 standard, and the torque range from 400Nm to 25000Nm. Each specification can provide multiple transmission ratio sharing options. It is suitable for gate valves, globe valves, and pressure pipeline valves. It is the best choice for process adjustment and control in petrochemical, electric power, and metallurgy. It can better match the controls units of different specifications.



FEATURE:

- Complete sealed transmission
- Gear ratio can be selected for any input ratio, widely used
- Comply with the IP67 sealing protection level specified by EN60529
- Reliable operation stability and long-term maintenance-free guarantee
- The movable drive shaft sleeve is flexible and easy to disassemble
- Built-in grease to improve service life and seal
- The worm support angle is fully self-locking
- 0 – 90° mechanical limit
- Suitable for working environment -40°C ~ +120°C
- Convenient processing and matching connection size
- Convenient processing and matching connection size



Technical Parameter

Overall Specification	Torque Range	Multi-turn Direct: 40-3000N.m With gear box: Max. 50,000Nm	Quarter-turn Direct: 40-1000Nm With gear box: Max. 500,000Nm
	Control Type	On/Off. Regulating. Field Bus	
	Shell Material	Aluminum Casting CKD180/CKD250/CKD300 adopts nodular cast iron	
Shell Protection	Protection Grade	Standard configuration: IP68	
	Environment Temperature	Standard: -30 ... +70 High temperature: -30 ... +150 Low temperature: -50 ... +70	
	External Anti-corrosion Protection	Standard coating Special anti-corrosion protection used in ocean and chemical engineering corrosion environment can be selected All the fastening bolts on the end cover adopt stainless steel bolt	
	Double Seal Protection	The control section of actuator is completely separated from the connection box so as to protect the electronic components	
	Explosion Proof Grade	Exd II BT4/CT4 Up to Exd II CT6	
Motor	Motor Technical	Fully sealed non-air-cooled squirrel cage motor (AC) Insulation class F (class H can be customized) Built-in overheat protection Sealed ball bearings are installed on the front and back for easy disassembly	
	Motor Working System	S4 Motor by standard IEC34-1 (periodic start and electric braking) S2 Short-time duty: used for on/off operation rated operation time 15min SS-50%: used for adjustment operation-maximum boot times are 1200/hour	
Mechanical Specification	Gear Drive	Self-locking can be realized at all speeds	
	Hand Wheel	The hand wheel doesn't rotate along with the electric operation Automatic separation and reunion or hand wheel can be realized without manual operation Hand wheel operating torque conforms to GB/T 28270 standard	
	Output Flange	The flange of multi-turn actuator conforms to ISO 5210/GB 12222 standard The flange of quarter-turn actuator conforms to ISO 5211/GB 12222 standard	
	Output Shaft	Special flange is optional for top size of valve Adopt dismountable sleeve Large torque quarter-turn gear box: processing 1/4 segment directly	
	Lubrication	The lubrication of actuator is effective along the whole service life and there is no need for special regular maintenance	
Electric Specification	Power Supply	Multiple Power supply can be selected: Three Phase or Single Phase 220V/230V/380V/415V/460V 50Hz or 60Hz	
	Cable Inlet	Standard configuration: Ordinary type: 1 M48'2 and 2 M33'1.5 Explosion proof type: 1 x 1.5" NPT and 2 x 1" NPT (Suitable cable entry will be provided for redundant bus) If there is any need, please contact the marketing department Sunflower terminal disk internal and external grounding terminal	
	Fusing Protection	Self-recovery fuse	
	Insulation Properties	The insulation resistance between the input terminal and the shell shall not be lower than 20MΩ The insulation resistance between the input terminal and the power supply terminal shall not be lower than 50Ω The insulation resistance between the power supply terminal and the shell shall not be lower than 50MΩ	

Technical Parameter

Sensor	Location	Absolute coding technology Measurement range: 1.5-4096 circles of rotation of drive sleeve
	Torque	Utilize dynamic measurement of useful work of three-phase power suppl and motor current to measure torque Setting range: 40% - 120% of the rated torque of the actuator Measuring range: 10-100% of actuator torque. Resolution 1%.
Control	Motor Control	Integrated motor reversing starter (AC contactor or Solid State Relay), automatically identify the power phase.
	Display	LCD/LED display with back-light
	Control	Control command: Voltage: 10-36 VDC/60-250 VAC Dry contact (using the 24 VDC auxiliary power supply inside the actuator) Isolate with photoelectric coupler Minimum pulse interval: 30ms Rotation reversing time: 1s (factory setting range: 1-10s)
	Signal Relay	4 relays: output can be selected among 27 information Contact configuration: normally open or normally close Minimum current: 40mA for 5V Maximum current: 5A for 250 VAC or 5A for 30 VDC (inductive load) Extra relay board is optional
	Supervisory Relay	Normally close, live part, SPDT contact Minimum current: 10mA for 5V Maximum current: 5A for 250VAC or 5A for 30VDC (Inductive load)
	Proportional Control Adjustment	Input (setting) and output (feedback) signals are completely separated Signal setup (optional) Input signal: 4-20mA Output signal: 4-20mA Input signal: 0-10V Output signal: 0-20mA (0-10V with external resistance) Analog input Current: Impedance 250Ω Analog output Current: Maximum acceptable load under 24 VDC is 750Ω Basic error: ±1% Return difference: ≤1% Dead zone: 0.5%-10.0% adjustable Damping characteristics: No oscillation
	Signal Battery	Used to display and update switch position information (through signal relay) during power failure
Settings	Setting	Non-intrusive infrared/ Bluetooth communication setup All the actuator setup and parameter are stored in a nonvolatile ferroelectric memory with password protection
	Field Knob	Can be completed through filed display screen and rotary knob No special tool is required Local and remote rotary knobs can be locked Field rotary knob can select local remote or halted mode and local electric operation can be realized with the help of field rotary knob under local mode
EC Command	EC Command	The actuator conforms to the following requirements: 2004/08/EMC electromagnetic compatibility 2006/95/EC low voltage The following coordinative criteria General emission standard for industrial environment EN61000-6-4 General anti-interference standard for industrial environment EN61000-6-2 Rotating electric motor standard EN60034-1 Protection grade provided by sealing shell (IP code) EN60529