

CHEMSUN Electric Actuators



CSR / L - G03 Series Flameproof and Heavy-load style

Suitable for petrochemical, electric-power, metallurgy, nonferrous metals, light industry and HVAC industry

Unique functions Super-large output torque, Planetary Drive
Hand wheel without clutch

Transducer Sensitivity 0.1%

Actuator Accuracy $\leq 0.5\%$

Rotary OutputTorque 200 – 130000 Nm

Linear OutputThrust 50 - 200KN (On request)



General Technical Parameters

- Supply Power 380/460 VAC ; 230VAC
- Explosion Protected ATEX/IEC Exd IIC T6
- Degree of protection IP67; IP68
- Ambient Temperature -40 to +85
- Input/output Signal
 - Control type : 4(0) –20 mA / 0 –10(5)V
 - On/off type : Dry contact switch
- Alarm Way 2 – 6 Ways
- Electrical connection 2 – M32/20x1.5
- Full Stroke time 7– 300Seconds
- Rotary output Torque 300-120000 Nm
- Linear output Thrust 50-200 KN
- Rotary Stroke 90 °
- Multi-turn (On request)
- Linear Stroke 20/35/85/160/350/650mm...

Universal design standards

- American society of mechanical engineers (ASME)
- The fire protection association (NFPA)
- National Electrical Code (NEC)
- The electrical and electronic engineers (IEEE)
- ANSI/IEEE472

Structural Features

- High resolution and repeatability, 0.1% transducer sensitivity, $\leq 0.3\%$ actuator accuracy
- Planetary drive, and Hand wheel without clutch
- Wiring, programming terminal compartment, Main engine and driving room, Separate, double-sealed.
- Watertight IP68 and explosion-proof enclosures
- Non-intrusive setup/calibration using Bluetooth.
- Optional bus interfaces available



Fig.1: Type CSR-G03 Series Rotary E-Actuator



Fig.2: CSR-G03Series Heavy-load E-Act.
With Gearbox Output 60000Nm

- Avoid demolition lid non-immersed Modular Design: without opening the cover to parameters set by magnetic button on the operation panel or infrared remote control Infrared remote control device, browser, control.
- Rich display functions: input and output, alarm, fault, all menu display English/German/Chinese characters at a glance, instead of the symbols, code display.
- Mechanical transmission:differential planetary gear drive principle, bearing, engage shocks, mechanical life is far greater than the wormand gear or spur gear structure.
- Adjustable speed: AdjustableDC speed control in the real sense, flexible slow to open, flexible slowly shut down any itinerary segment arbitrarily set speed, play a very good protection valve.
- Torque adjustable: actuators are used to adjust the maximum adjustment range torque, thrust overload protection value \pm 0–100%.
- Flow Characteristics Compensation: you can optimize the flow characteristics of the valve, to achieve the best process control quality.
- Stroke limit: two ways to choose, mechanical limit and software limit. The mechanical limit is adjusting the stroke switch in the main cabin, to realize the reliable and safe operation of the actuator. The software limit is completed by parameter configuration.
- Local/Remote worry-free switching function: no clutch mechanical design is in the running state, handwheel rotation.
- Self-diagnosis function:Off signals, overcurrent, overtemperature, phase sequence, automatically identify and lack of protection.
- Self-test function: Fault self-diagnosis display alarm.
- Positioning accuracy No friction electronic brake technology: actuator received a open and close, stop position instruction from controller, the control unit automatic operation began to slow time, reduction position, when the velocity to the very low, began to brake, avoid to slam on the brakes, to ensure the Positioning accuracy.
- Stuck plugging, overload protection: encounter valve actuators card blocking phenomenon, the system will automatically try to three times the impact of the card and block lift, run automatically stuck blocking unsuccessful, then alarm.
- PDA support function
 1. Infrared automatic bit number search.
 2. Always real-time view of the actuator more 30 kinds of state.
 3. See the electronic files of the actuator.
 4. For the past 30 days, every 30s detailed operating data, work status record, store, download , analyze , forwarding , printing.



Fig.3: CSR-G03Series Heavy-load E-Act.
With Gearbox Output 800Nm



Fig.4: CSR-G03Series Heavy-load E-Act.
With Multi-tur Gearbox



Fig.5: CSR-G03Series Heavy-load E-Act.
With Gearbox Output 120000Nm
For Butterfly valve DN1200

Internal structure of electric actuator(Pig.6)

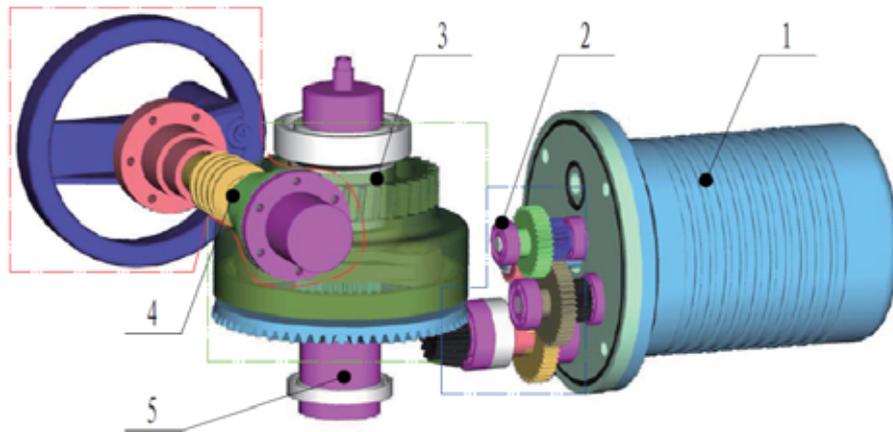


Fig.6: CSR-G03 Internal structure of electric actuator

- 1. Alternating current Motor
- 2. Reduction gear
- 3. Planetary gear reducer
- 4. Hand wheel without clutch
- 5. Output shaft

E-Actuator operation panel



Fig.7: E-Actuator operation panel



Fig.8: CSR-G03 Heavy-load E-Actuator With Ball valve DN600

Simple and Humanized operation

- **Key-press** : Four Holzer button can complete all the parameter settings, configuration and adjustment, fault information and the cause of the query. The information is displayed directly on the screen in an intuitive way. English / German / Chinese free switching.
- **Infrared remote control** : Wireless infrared remote control device can replace all the features of the panel button within 10 meter range.
- **PC terminal settings** : Bluetooth and PC wireless connection, set up and configure the parameters.

Valve Position detection and feedback

Two Holzer absolute encoder detection and feedback valve position. A block is placed on the final gear output, induction end position, the other on the output end of the motor, can measure the precise position of perceptual motor, this signal will be delivered to the operation unit of the main control board, as the valve position data trace compensation and correction. It can effectively improve the detection of the valve position feedback and the accuracy of the data, so as to reduce the system error actuator.

Double protection of valve position limit

Stroke limit : two ways to choose, mechanical limit and software limit. The mechanical limit is adjusting the stroke switch in the main cabin, to realize the reliable and safe operation of the actuator. The software limit is completed by parameter configuration.

Torque detection and over torque protection

The output torque of the actuator is accurately measured by the hardware of the torque sensor, and the measurement value is accurate and reliable. At the same time, the double detection technology is used to analyze and calculate the measured value of the control current and voltage value, so as to ensure the accurate setting and protection of torque and torque. When the actuator is initialized, the over force protection is arranged. Once the torque condition occurs, the control circuit stops the motor immediately, and sends out and displays the alarm to ensure that the actuator and the drive object are not damaged.

Alarm settings

As many as six groups of alarm output, each output is normally open / closed dry node, can be configured to alarm content, alarm public terminal independent, suitable for connecting different alarm power.

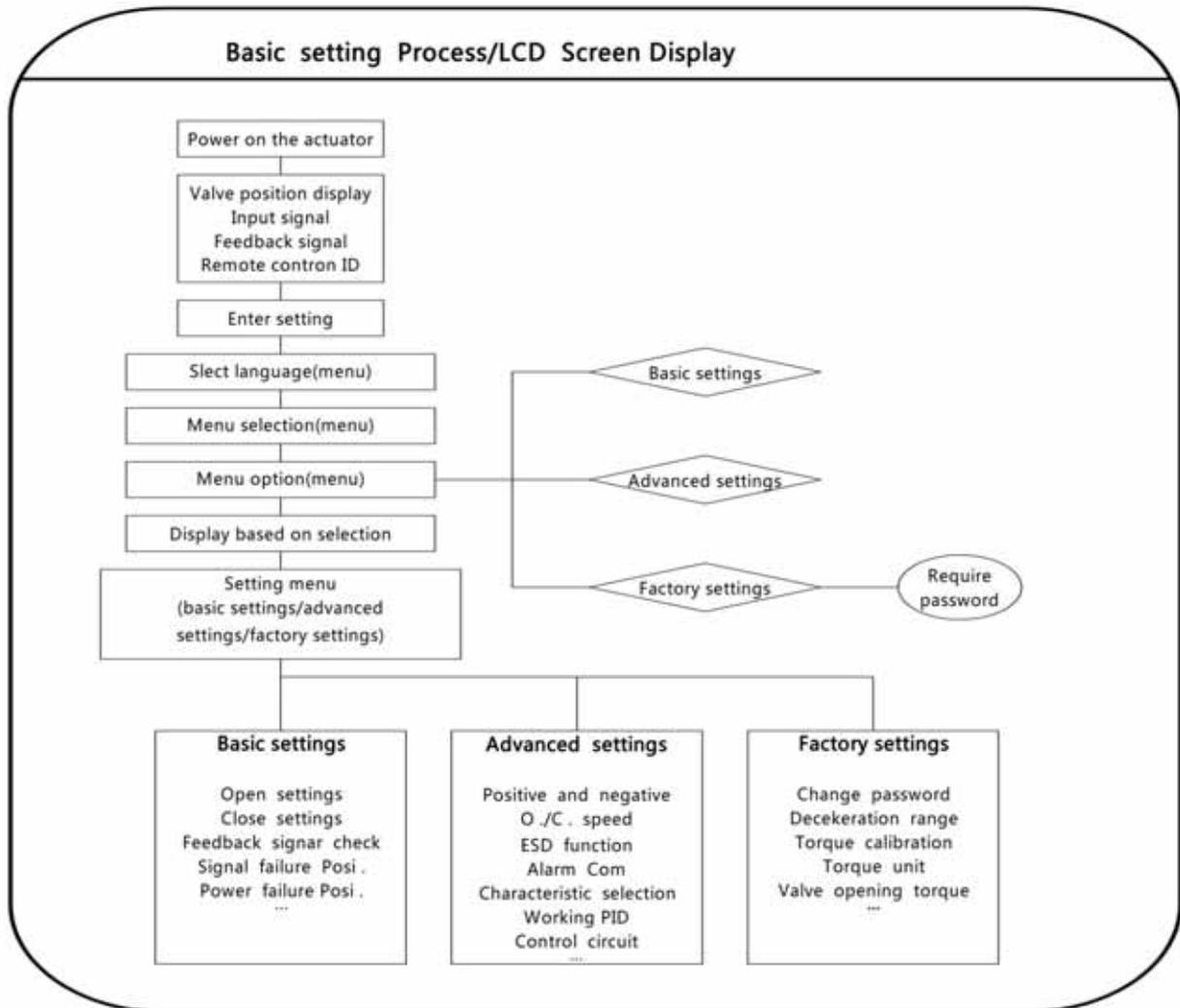
Control signals and types

- **Valve position control** : According to the controller, PLC or DCS output of the control signal (4 - 20mA or 0 - 10V, etc.), the actuator automatically and accurately runs to the corresponding valve position.
- **ESDEmergency control function** : In case of emergency, the actuator performs the action (opening, closing, or other position) in accordance with a predetermined schedule to meet the safety requirements.
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Fig.9: Mechanical limit of over torque

Actuator parameters menu and program



Note : Refer to installation and operating instructions.

HART and Bus communication technology

HART Communication protocol

HART(Highway Addressable Remote Transducer) is based on the Bell202 standard FSK frequency shift keying signal, the low-frequency 4-20mA analog signal be superimposed on the amplitude of 0.5mA audio digital signal for two-way digital communication, data transmission rate is 1.2kbps. Since the average value of the FSK signal is 0, it does not affect the size of the analog signal transmitted to the control system. In the HART protocol communication, the main variables and control information are transmitted by 4-20mA. In the case of need, the other measurement, process parameters, equipment configuration, calibration and diagnostic information are accessed through the HART protocol. CHEMSUN products comply with the HART communication protocol, can easily access any accord with the agreement of the network system, can provide reliable data transmission.



PROFIBUS DP

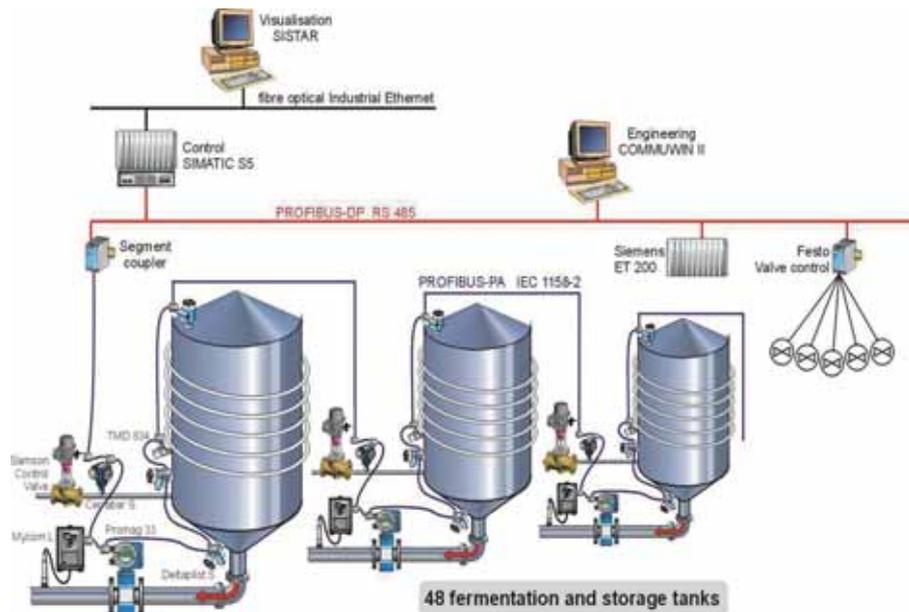
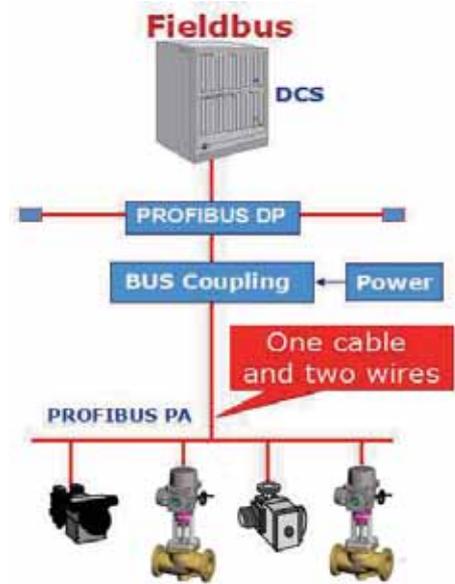
PROFIBUS-DP (Decentralized Periphery) It is suitable for communication between equipment level control system and distributed I/O. The master station manages and controls the entire DP network through a standard PROFIBUS-DP dedicated cable, which commu. with the scattered field devices (remote I/O, actuators, valves, smart sensors, or lower level networks). Most of the data exchange in PROFIBUS-DP is periodic, and the first kind of master station (Master) reads the input inform. of each slave station (Slave) circularly, and sends the output information to them. Use PROFIBUS-DP to replace 24VDC or 4-20mA transmission.

The central controller, the programmable controller, the host computer and so on are input or output by binary or analog input by a high speed serial interface, as well as peripheral devices. Periodic data exchange equipment rooms, all connected with the PROFIBUS product support V1 service functions, to achieve non periodic data exchange.

The master station periodically sends information to the slave station and receives its output information periodically from the slave station. In addition to image processing, PROFIBUS-DP has a powerful diagnostic and debugging function. At the same time, the master station and slave station have monitoring function for monitoring data transmission.

GSD file contains the parameters configuration and other related content, users can use the GSD file structure, content and code standards. GSD file is suitable for the electric actuator PROFIBUS DP interface: DRGSD, GSD. Each table of the PROFIBUS-DP bus device has its own identification number.

CHEMSUN series actuator can be easily integrated into any PROFIBUS fieldbus control system, fieldbus components not only through the PROFIBUS user organization (PNO) certification and testing, but also can be equipped with other bus interface, compatible with other bus technology.



Advantages

- Save hardware cost.
- Design, configuration, installation, debugging become more simpler.
- Good system security and reliability, reduce downtime.
- System maintenance, equipment replacement, system expansion become more simpler.
- The user's system configuration, equipment selection has the greatest autonomy.
- Improve enterprise information system and realize enterprise integrated automation.

MODBUS RTU

MODBUS RTU code is the first to promote a soft communication protocol MODICOM, in the RS232/RS485 communication process, it is widely used in this statute.

Through the MODBUS communication protocol, the controller can communicate with other devices through the network. It has become a common industry standard. CHEMSUN products comply with the standard MODBUS communication protocol, and can easily access any network system in accordance with this Agreement.

Product database

The perfect product information management is the key link of CHEMSUN product quality tracking, and it is also the important means and guarantee of product quality management. Each of CHEMSUN products and accessories are recorded in a central database, the information of all production and processing, assembly and sales operation and other related products can be traced back to the original data query, and maintenance of the products are available through remote consultation system operation (PDA) feedback to the central database, without losing any information, and can be traceability management of product quality.

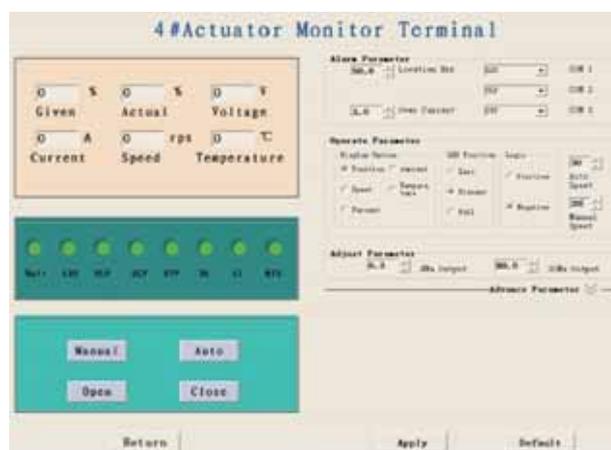
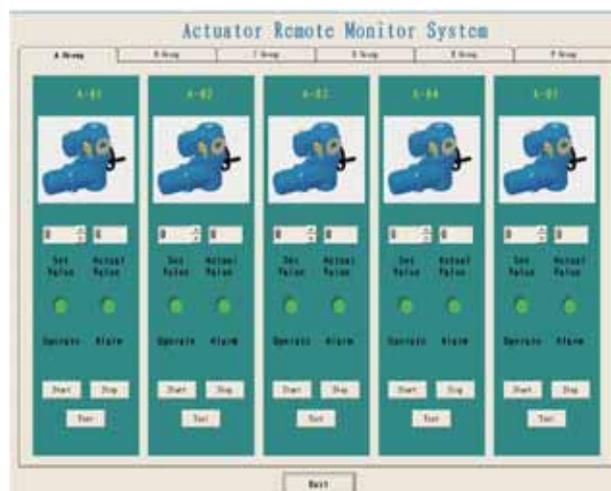


Table 1: Technical data

CHEMSUN CSR - G03 Series Heavy-load E-Actuator	
Rotary stroke output torque range	200-120000 Nm
Linear stroke output thrust range	50 - 200KN
Stroke range	95 ° ; 20 / 35 / 85 / 150 / 350 / 650 mm...
Supply power	400 VAC (50/60 Hz)
Shell material	Cast Al. 3.2373
Explosion-proof type	Ex d IIC T6
Protection grade	IP66 / 67 / 68
Input signal	4(0) – 20mA; 0 – 10(5)V; Dry contacts, Switch
Output signal	4(0) – 20mA; 0 – 10(5)V; Dry contacts, Switch
Power fail safe position	FL (Fail Lock)
Ambient temperature	Standard -25 to +85 ; Low temp. -40 to +70
Transducer Sensitivity	0.1 %
Actuator Accuracy	≤ 0.5 %
Response time	200 ms
Alarm configuration	2 – 6 Paths
Communication protocol	HART, PROFIBUS, MODBUS
Ambient humidity	100% RH

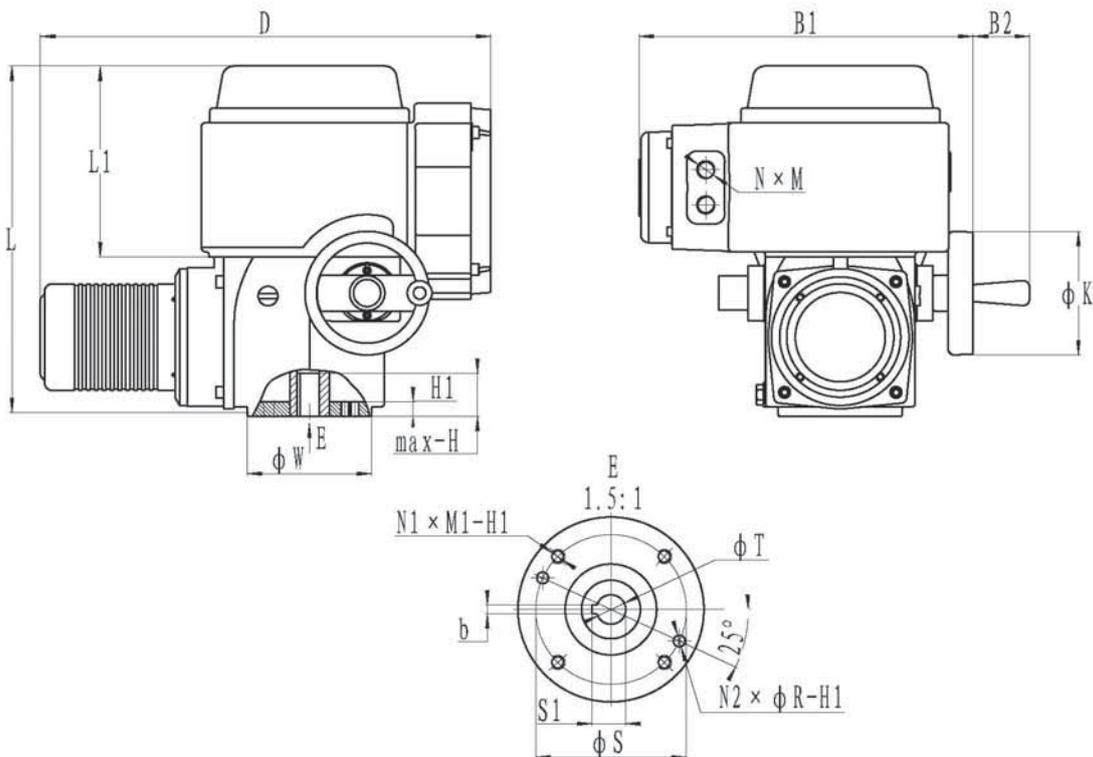
Adjusting speed range	15 – 100%
Torque adjustment range	10 – 100%
Seismic capacity	3 axis 6 g

Table 2: Basic parameters

CHEMSUN CSR / L - G03 Series Heavy-load E-Actuator		
Sell material		Cast Al. 3.2373
Motor Data	Type	Alternating current Motor
	Body material	Cast Al. 3.2373
	Rated power	0.4/0.8/2.0 KW
	Rotation rate	600 – 3000 rpm Cast Al. 3.2373
	Cooling mode	Air cooling
	Temp. class	About 70
	Protection grade	IP 67
	Structural chara.	Alternating current Motor
	Insulation grade	Class H
	Moment of inertia	60 g·cm ²
Mechanical drive		Mechanical drive
Hand wheel		Hand wheel
Position feedback		Position feedback

CSR - G03 Series E-Actuators Dimension drawing

Actuator CS.G03-series



Main dimensions

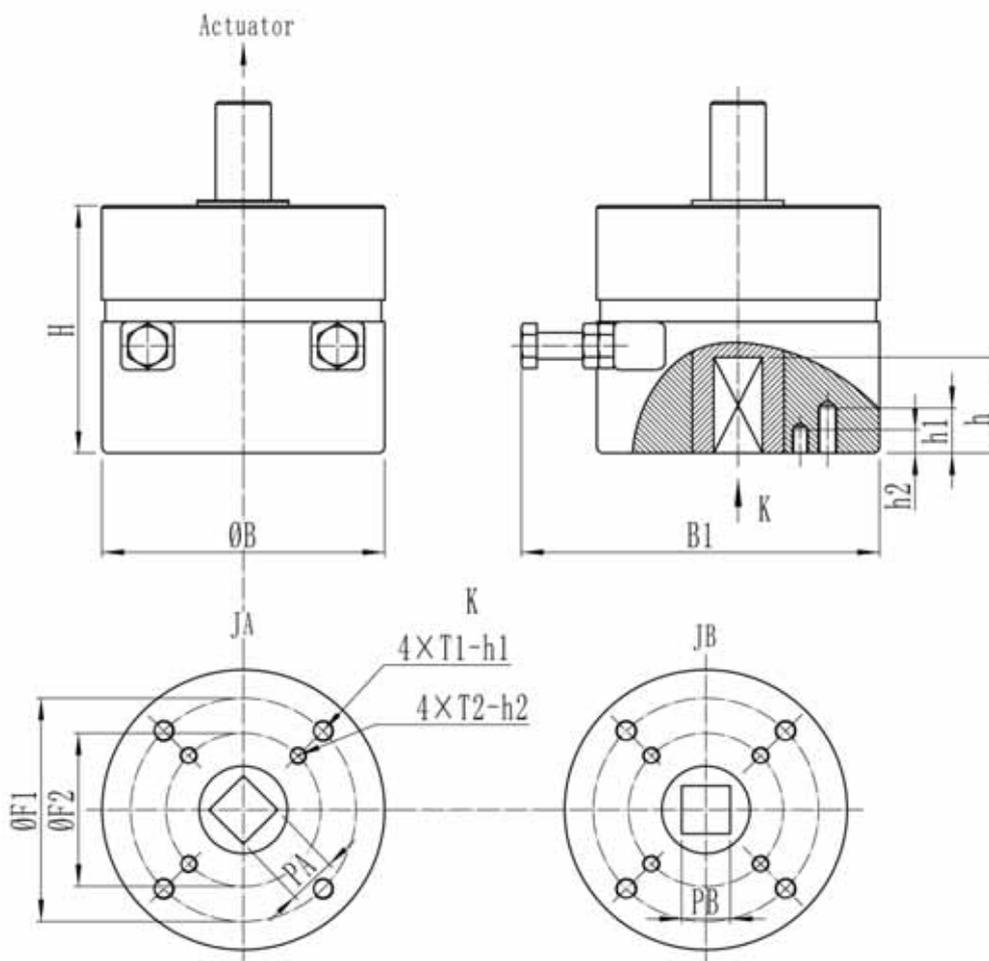
Unit:mm

Type	D	L	L1	B1	B2	K	W	N × M	N1 × M1	N2 × R	S	S1	b	T	H	H1	Flange size
G03	457	354	195	340	55	125	126	2 × M20 × 1.5	4 × M10	2 × Ø8	102	22.8	6	20	63	15	F10

Note : Flange standard according to DIN ISO 5211.

Quarter-turn gearbox dimensions

Quarter-turn gearbox A



Main dimensions

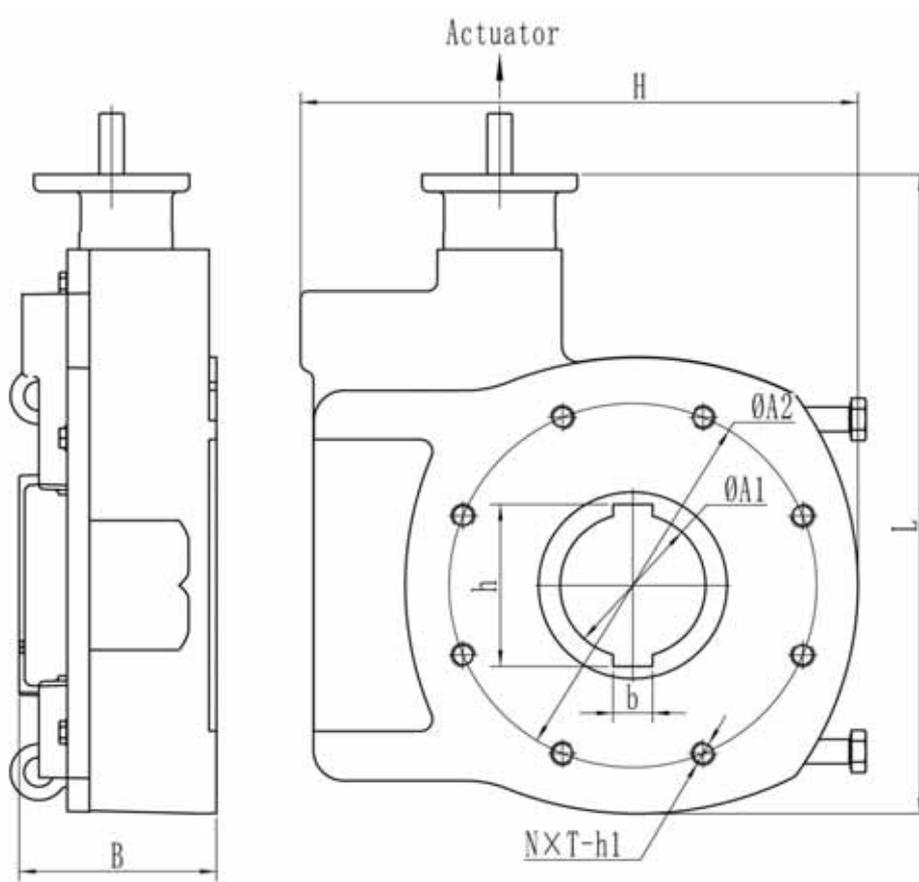
Unit:mm

Type	H	B	B1	PA	PB	h	h1	h2	T1	T2	F1	F2	Flange size
A1	113	128	165	22	22	35	25	20	M10	M8	102	70	F07/F10
A2	128	154	175	27	27	46	30	25	M12	M10	125	102	F10/F12

Note : Flange standard according to DIN ISO 5211.

Quarter-turn gearbox dimensions

Quarter-turn gearbox B



Main dimensions

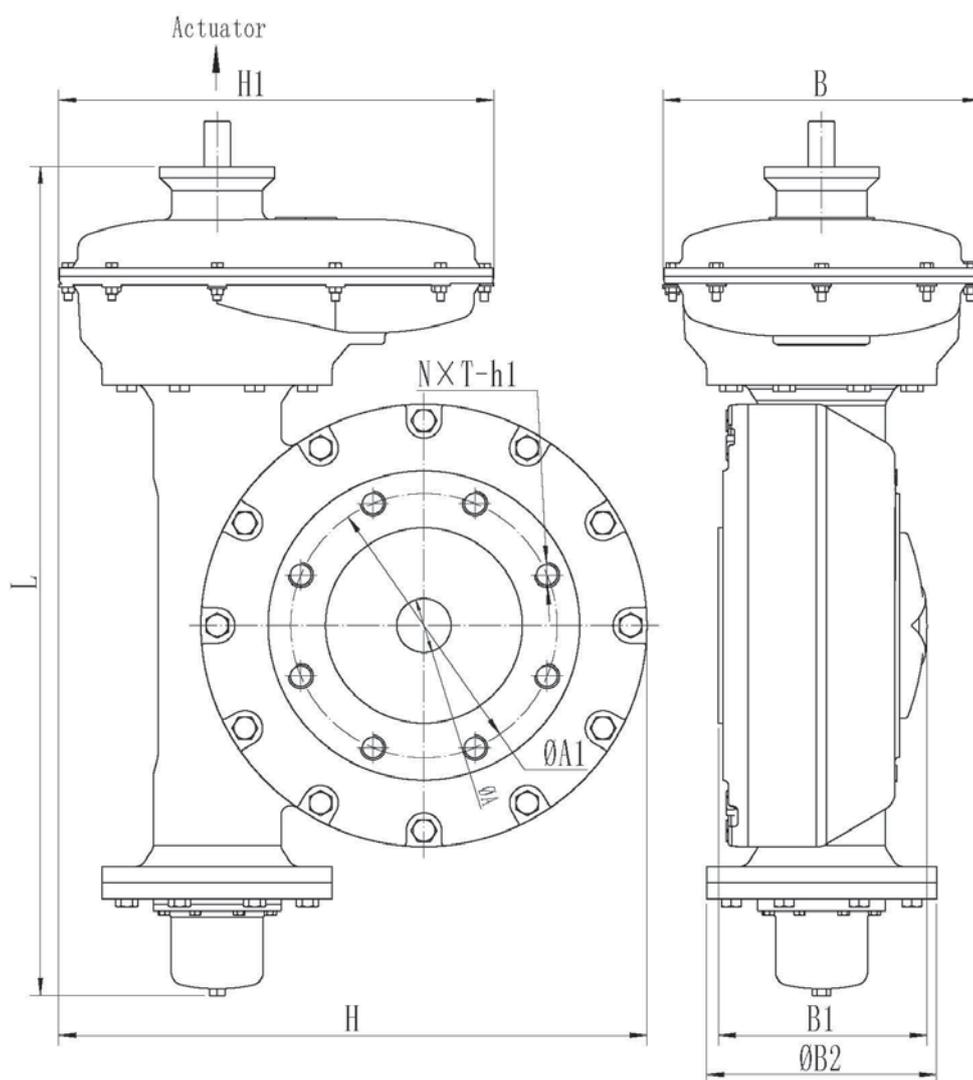
Unit:mm

Type\	H	B	L	A1	A2	N	T	b	h	h1	Flange size
B1	248	96	252	66	140	4	M16	20	75.8	18	F14
B2	304	110	303	90	140	4	M16	25	100.8	23	F14
B3	363	108	343	95	165	4	M20	25	103	18	F16
B4	361	110	446	95	165	4	M18	25	105	18	F16
B5	450	160	523	118	298	8	M18	32	132.8	18	F30
B6	563	230	692	166	406	8	M20	40	184.8	35	F40

Note : Flange standard according to DIN ISO 5211.

Quarter-turn gearbox dimensions

Quarter-turn gearbox C



Main dimensions

Unit:mm

Type	H	H1	B	B1	B2	L	A	A1	N	T	h1	Flange size
C1	897	663	483	318	350	1274	Custom-made	406	8	M36	48	F40

Note : Flange standard according to DIN ISO 5211.

Note : For at least 16 weeks ahead of time for Super-large torque gear box, please consult CHEMSUN China sales agent: Beijing Chemsun Controls Co. Ltd.

CSR - G03 Series Rotary E-Actuator Selection type tabl

CHEMSUN E-Actuator Type CSR-G03-		X	X	X	X	X	X	X	X	X	-	X	X	X
Explosion-proof type														
Exd IIC T6		1												
Rotary Stroke														
90°		1												
Special Angle (On request)		9												
Supply power														
380 V AC 50/60Hz		1												
230 V AC 50/60Hz		2												
Input signal type														
On/off switch Dry contacts						1								
4 -20 mA						2								
0 -20 mA						3								
0 -10(5) V						4								
Feedback signal type														
Without						0								
4 -20 mA						1								
Max. Output torque. Nm (Gear Box B1-B6; C1-C2)														
NON	200					0								
B1	1600					1								
B2	2000					2								
B3	4000					3								
B4	6000					4								
B5	8000					5								
B6	10000					6								
C1	65000					7								
C2	130000					8								
Power fail safe position														
FL (Fail Lock)						0								
Temp. range														
Standard: -25 ~ +70 °C										1				
Low Temp.: -40 ~ +85 °C										2				
Special Function														
Non (Standard)											0			
PID loop, Flow characteristic compensation, etc. (On request)											1			
Special Rev.														
None												0	0	0

Output mechanical connection

The connection design conforms to the ISO5211 international standard, and suitable for each kind of form mechanical connection, guarantees with all valves reliable connection.

CHEMSUN all electric actuators can be used in different assembly objects, there are different forms of terminal output mode, can be based on customer requirements to provide special output terminal size,



Fig.15: Actuator output shaft and connecting bracket

Ordering text 01

Rotary E-Actuator	Type CSR-G03- ...
Explosion-proof type	Exd IIC T6
Max. Torque	None, A1/A2/B1/B2/B3/B4/B5/B6
Supply Power	24VDC ; 24/110/230VAC (50/60Hz)
Input / Output Signal	4(0)-20mA ; 0 – 10(5)V; Switch
Power Fail Safe Position	FL(Fail Lock)
Valve Type	V-Ball Control Valve; Rotary-plug Valve; Butterfly Valve; O-Ball Valve ...

Ordering text 02

Linear E-Actuator	Type CSL-G01- ...
Explosion-proof type	Exd IIC T6
Max. Stroke	H=20,35,85,160,350 mm
Max. Thrust	50 - 200KN
Supply Power	400/230VAC (50/60Hz)
Input / Output Signal	4(0)-20mA ; 0 – 10(5)V ; Switch
Power Fail Safe Position	FL (Fail Lock)
Valve Type	Globe Valve; Knife Gate Valve; Gate Valve...

*** Specifications subject to change without notice.



CHEMSUN EUROPE GMBH

Add: C/O Globe Office Center

Bleichstr.1, 60313 Frankfurt am Main

Fon: +49(0) 69 1338 5311 Fax: +49(0) 69 1338 5312

URL: www.chemsun.de Email: sales@chemsun.de