

CHEMSUN Electric Actuators



CSR/L - G01 Series: High-performance precision adjustment style

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

Unique functions	Power	Fail Safe Reset Position (FC/FO/FL/FS)
		DC brushless Motor, Planetary Drive Hand wheel without clutch
Transducer Sensitivity		0.1%
Actuator Accuracy		≤ 0.3%
Rotary Output	Torque	50 – 60000 Nm
Linear Output	Thrust	5 – 160 KN



Linear OutputThrust

- Supply Power 24 VDC 24/110/230/380/460 VAC
- Explosion Protected ATEX/IEC Exd IIC T6 ; Non Ex
- 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
- Power Fail SafeReset Pos. FC/FO/FL/FS
- Electrical connection 2 – M20x1.5
- Full Stroke time 7– 300Seconds
- Rotary output Torque 50 – 60000 Nm
- Linear output Thrust 5 – 160 KN
- Rotary Stroke 90 ° / 180 ° / Multi-turn
- Linear Stroke 20/35/85/160/350/650mm...



Fig.1: Type CSR-G01 Series Rotary E-Actuator

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

- Supply Power : 24 VDC; 24/110/230/380/460 VAC
- High resolution and repeatability, 0.1% transducer sensitivity, ≤ 0.3% actuator accuracy
- Selecting valve position when power fail, FC/FO/FL/Any Position
- Plane tary drive, and Hand wheel without clutch
- DC brushless Motor, This allows maintenance free operation with continuous unrestricted modulation duty
- Characteristic selecting, Linear/Equal percent/Quick open/Self-definition
- Integrated Working condition PID control circuit
- Wiring, programming terminal compartment, Main engine and driving



Fig.2: CSL-G01 series Linear E-Actuator With Type3244 3-way Globe control valve

room, Separate, double-sealed

- Watertight IP68 and explosion-proof enclosures
- Non-intrusive setup/calibration using Bluetooth
- Optional bus interfaces available
- With or without Ex.

Standard Functions

- 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.
- Application of electronic commutation technology, smooth operation, adjustable speed.
- 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: Type CSR-G01 Rotary E-Actuator With CHEMSUN Control V-Ball valve



Fig.4: Type CSL-G01 Linear E-Actuator With SAMSON Globe Control valve

DC brushless Motor

Motor is an important part of electric actuator. Brushless DC motor in the application of electric actuator, to drive control technology has brought a huge leap.

The permanent magnet brushless DC motor is composed of the motor main body. The rotor of the motor is made of rare permanent magnetic alloy material such as Nd-Fe-B. The start, stop, speed and forward and reverse of the motor are controlled by the integrated master program.

Brush and brushless Motor Analysis

Brush motor with mechanical commutation, short life, noise, electric spark, low efficiency. At the same time, a lot of carbon dust is produced by the wear and tear, and the bearing is accelerated to dry, and the motor noise is further increased. Brush motor for a certain period of time on the need to replace the motor carbon brush.

Brushless motor with electronic commutation instead of mechanical commutation, no mechanical friction, no wear, no spark, no maintenance, and can achieve more sealing and so on, so the technology is superior to the brush motor. Brushless DC motor volume is much smaller than the same capacity brush motor or three-phase asynchronous motor.



Fig.5: Permanent magnet BLDC motor

DC brushless Motor Advantages

- High speed and wide adjustment range, uniform and stable speed control, suitable for steady speed, speed, precision positioning and other conditions.
- The motor using PID control technology, after the start to accelerate the operation of the steady state, the negative acceleration and steady stop in the control position. (see the DC motor speed and output process analysis)
- The use of electronic commutation technology, long life, high reliability, high control precision, allowing for blocking, no maintenance.
- The motor speed ratio up to 1: 50 – 100 under constant torque load.
- Start torque large, small current, overload ability, good dynamic performance, low calorific value, very suitable for driving a long time continuous operation conditions.
- The operation of the motor is without interference in the power grid, control systems and other electrical equipment, and low power consumption, energy saving.
- Excellent temperature characteristics.

BLDC motor speed and output process analysis

T1 : When given signal and position feedback signal appears deviation, motor starts at low speed, and uniform acceleration speed.

T2 : Motor speed gradually increases to the maximum value, then begins to near the set position.

T3 : The deviation decreases and the motor starts to slow down.

T4 : Deviation elimination, motor stops running.

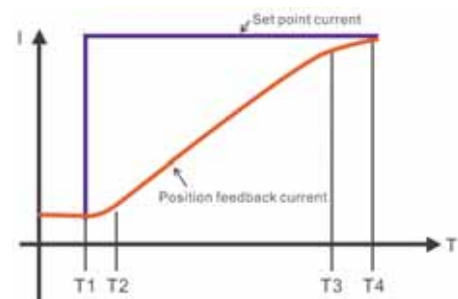


Fig.6a: The relation graph between the set current and position feedback current

Internal structure of electric actuator(Fig.7)

- | | |
|--------------------------|---------------------------|
| 1. bearing | 9. wheel cover |
| 2. pot gear | 10. spring groups |
| 3. bearing | 11. spring washers |
| 4. planetary gear | 12. handwheel worm |
| 5. center feedback lever | 13. motor gear |
| 6. gear ring | 14. bearing |
| 7. handwheel washer | 15. center wheel assembly |
| 8. handwheel | |

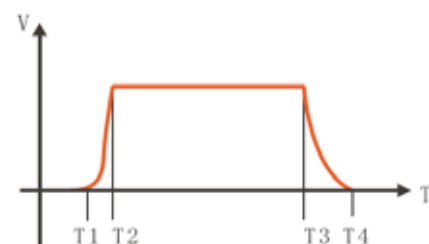


Fig.6b: E-Act. Running speed change chart

Mechanical transmission - Planetary drive Mode

Design Principle

CHEMSUN E-actuators transmission part consist of a gear ring, a pot gear and a planetary gear. The inner gear teeth of the gear ring have difference of the number of gears with the pot gear, and The utility model can effectively drive and enlarge the moment, and also can reduce the difference of the transmission and the transmission efficiency.

The outer tooth of the gear ring is meshed with the hand wheel worm, and the worm wheel and the worm wheel structure are self locked, so as to realize the smooth switching of the manual and the automatic working state without the clutch hand wheel.

*** This kind of drive structure is Chemsun ' s patent technology used in the electric actuator.

Advantages

- Larger transmission ratio, high transmission efficiency and small system error.
- Smooth running, low noise, large capacity.
- Long service life.
- Hand wheel without clutch.

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.

Powerful fault diagnosis and protection function

- **Input signal failure diagnosis and protection** : It can automatically identify the input signal failure, including the drop, short circuit, signal beyond the normal range of change, etc.. In the event of a failure immediately to send out and display alarm, and according to the fault signal processing mode selected by definition (open, closed, lock, or any position), automatically to the designated location.
- **Fault diagnosis and protection of position feedback signal** : Automatic diagnostic position sensor fault. Once the fault occurs, the output diagnostic alarm signal to avoid the detection of signal failure due to errors,
- **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.
- **Motor over current and over temperature protection** : Although the starting current and operating current of the BLDC motor are much smaller than that of the AC motor. The actuator is also provided with a protection for the overcurrent condition, and output alarm signal. Motor

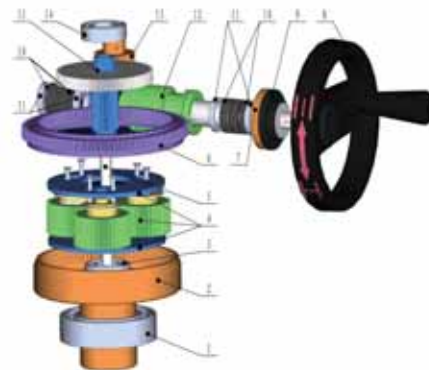


Fig.7: Internal structure of electric actuator



Fig.8: Planetary drive Mode, Hand wheel without clutch



Fig.9: Mechanical limit of over torque

with built-in temperature sensor, to real-time monitor the temperature and the motor temp.-rises, If there is abnormal temperature or temperature rise, immediately issued and displayed the alarm, and cut off the power supply, when the temperature dropped to the set value, the motor automatically will return to normal work .

- **Automatically try to remove the blocking function** : Because of the jam or other mechanical failures, the valve does not move, the actuator will automatically try to impact action three times according to the set, the control unit instructs the motor reverse rotation in one step, and then according to the original direction of operation, each impact torque does not exceed the torque protection value, so repeated three times. If the blockage disappears, the actuator returns to normal work. If the blockage is still present, the motor power is switched off automatically, and the alarm is sent out and displayed.
- **Emergency response (ESD) function** : In the case of an emergency ESD command, the actuator can be run directly to the set position: open, close, hold, or any position.
- **Double protection of valve position limit** : Software protection, Set the upper and lower valve position limit through the panel configuration, when the output alarm, jump action, cut off the power supply, etc. Hardware protection : When the upper and lower valve position reaches the limit, the contact switch is connected with the alarm, the jump action and the motor power supply.
- **Handwheel operation** : CHEMSUN uses the differential planetary gear transmission structure, the handwheel does not need the clutch switch, and realizes the manual operation directly. The automatic handwheel mechanism is always at rest, even if the handwheel is turned back to the position of the automatic signal, which will not cause negative effects. Customers can choose hand wheel locking mechanism.

Power Fail Safe Reset Position

The use of super capacitor energy storage, when the power failure, the actuator automatically switches to the capacitor discharge power supply, the valve may also be at least 1.5 stroke, valve failure safe position optional fully closed, fully open, lock or maintain any position (FC/FO/FL/FS).

Advantages

- This function can completely replace the pneumatic control valve failure reset function.
- No spring, no wear.
- Super capacitor selection of aviation technology, service life of up to 15 years.
- It can effectively diagnose whether the power supply flash failure (optional 0 - 10 seconds).
- Charging time is short, within 60 seconds to complete the effective charge.
- Environmental protection and energy saving, no pollution problem.

***This kind of drive structure is Chemsun ' s patent technology used in the electric actuator.

Control principle and main control module

Using three serial PID control loop: Drive motor control loop + Motor control loop + Final output control loop. Customers can adjust the

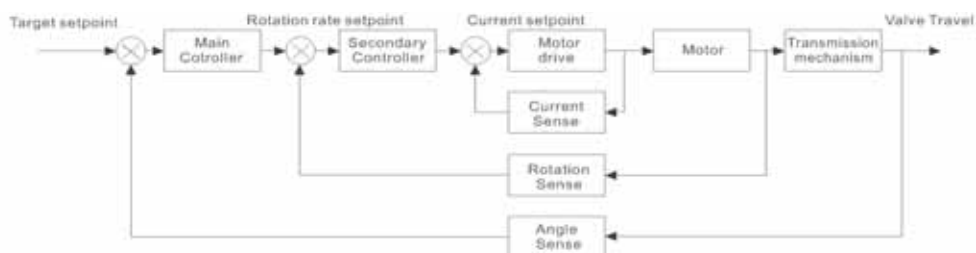


Fig.10: The super capacitor



Fig.11: Actuator master board

parameters of each control loop according to the requirements of the working conditions, and the optimal control quality and control precision have been achieved.

Note : Due to the coupling of the cascade control loops, the change and adjustment of the coefficients can only be completed by the manufacturer's professionals.

Power module

You can choose DC power supply (such as 24VDC) or AC (24VAC, 110VAC or 220VAC). When the input is AC, the power module is needed to convert it into a DC power supply to the motor. The DC voltage must be divided into three phase voltage drive motor by the inverter (DC / AC).

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.
- ESD Emergency 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.
- On/off control: According to the input signal of On/off, the actuator can carry out the corresponding switching action, and the On/off signal can be defined as a Inching operation or hold position when break signal.

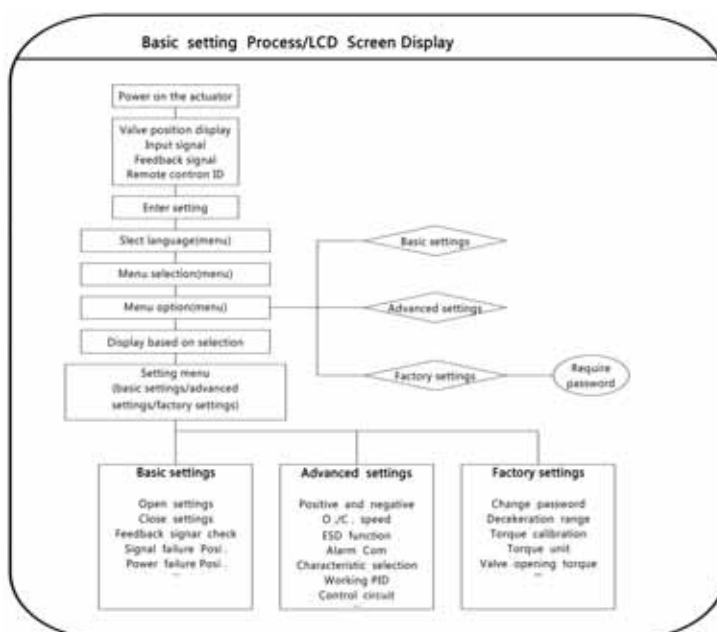
Simple and Humanized operation

- 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.



Fig.12: G01Series Operation panel

Actuator parameters menu and program



Note : Refer to installation and operating instructions.

HART and Bus communication technology

HART Communication protocol

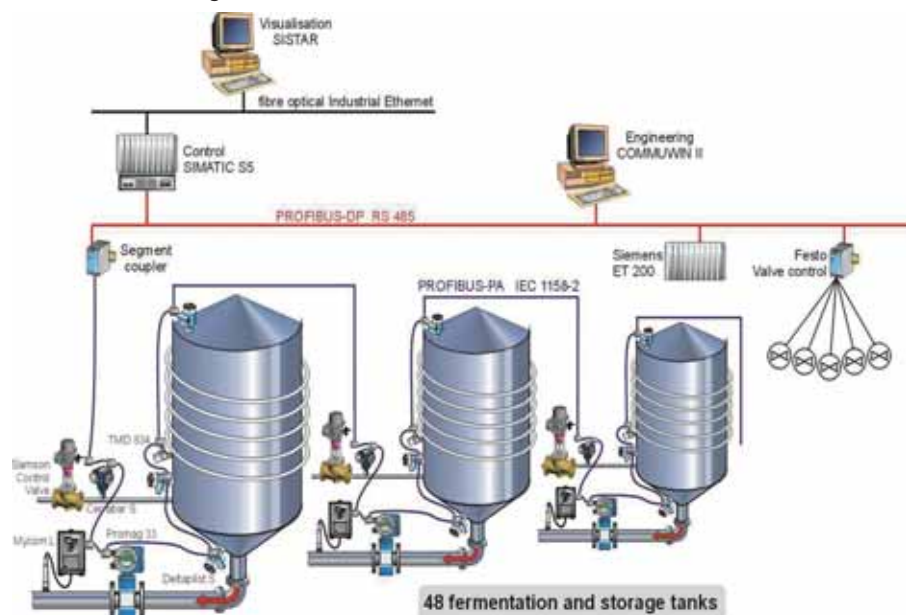
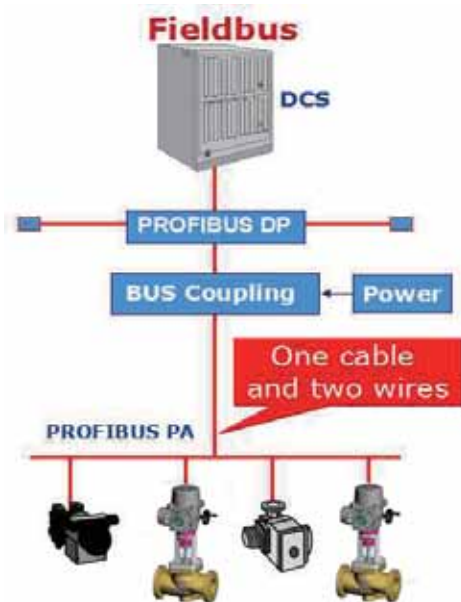
HART (Highway Addressable Remote Transducer) is based on the Bell202 standard FSK frequency shift keying signal, the low-frequency 4-20mA analog signal be superimposed on the amplitude of 0.5mA audio digital signal for two-way digital communication, data transmission rate is 1.2kbps. Since the average 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.

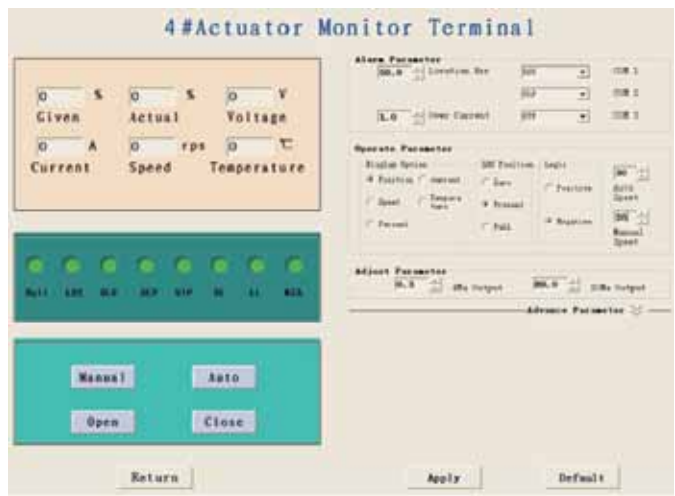
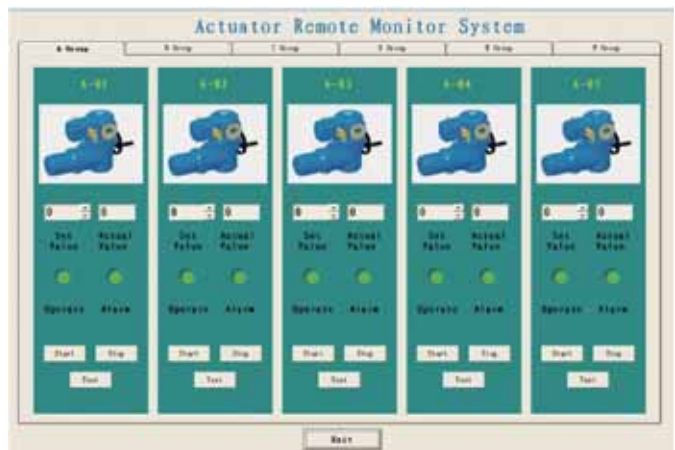


Table 1: Technical data

CHEMSUN CSR/L - G01 Series High-performance and precision adjustment E-Actuators	
Rotary stroke output torque range	50 – 60000 Nm
Linear stroke output thrust range	5 - 160KN
Stroke range	95 ° /185 ° / Multi-turn ; 20/35/85/160/350/650mm.....
Supply power	24 VDC , 24/110/230 VAC (50/60 Hz)
Shell material	Cast Al. 3.2373
Explosion-proof type	Ex d II CT6 ; Non Ex
Protection grade	IP67 / 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	FC / FO / FL / FS
Ambient temperature	Standard -25 to +85 ; Low temp. -40 to +70
Transducer Sensitivity	0.1 %
Actuator Accuracy	≤ 0.3 %
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 - G01 Series High-performance and precision adjustment E-Actuators		
Sell material	Cast Al. 3.2373	
Motor Data	Type	Permanent magnet brushless DC motor
	Body material	Cast Al. 3.2373
	Rated power	0.1 KW
	Rotation rate	600 – 4000 rpm Adjustable
	Cooling mode	Air cooling
	Temp. class	About 70
	Protection grade	IP 67
	Structural chara.	Electronic commutation, drive control motor action
	Insulation grade	Class H
	Moment of inertia	60 g·cm ²
Mechanical drive	Planetary gear transmission	
Hand wheel	Standard , Non-Clutch handwheel	
Position feedback	Absolute encoder	

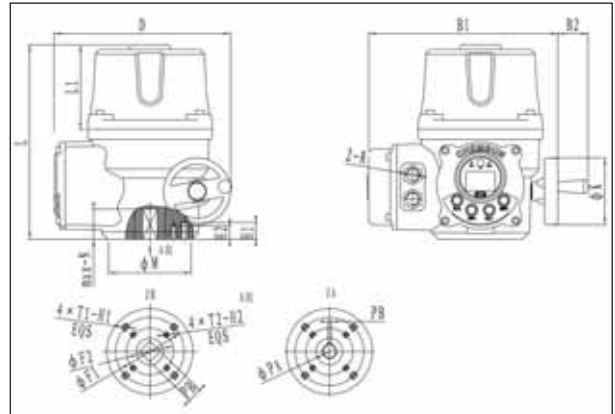
CSR / L - G01 Series E-Actuators Dimension drawing

CS-G01Series E-Actuator main dimension and Flange connection drawingUnit : mm

Type	PA	PB	F1	F2	T1	T2	H1	H2	\Flange size\
JA	20	6	102	70	M10	M8	25	20	F07/F10
JB	—	22	102	70	M10	M8	25	20	F07/F10

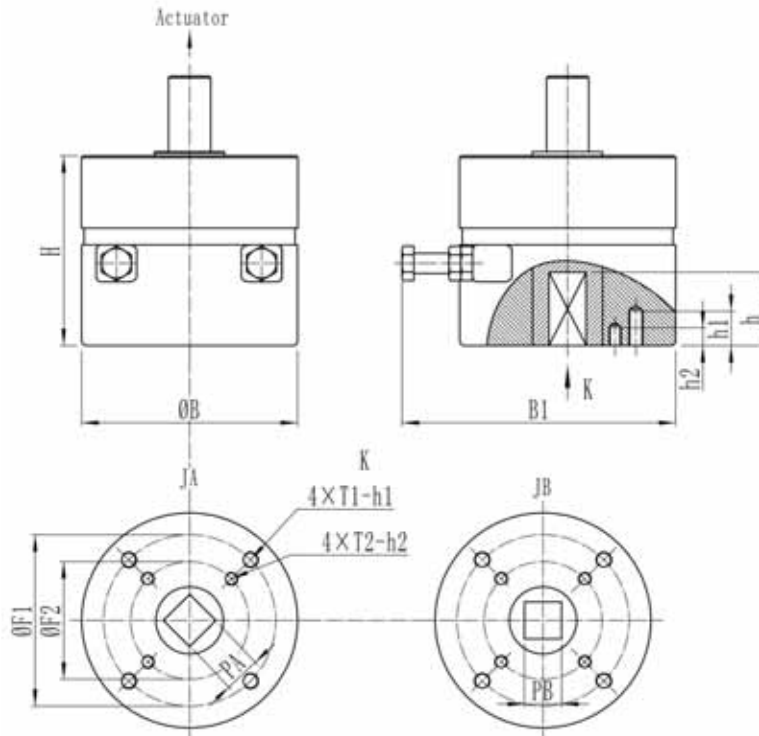
Type	L	L1	M	B1	B2	N	D	K	R
JA/JB	285	126	128	281	45	45	257	100	M20 x 1.5

Note : Product Factory standard for JB type, if the user has special needs, Type JA can be equipped. Flange standard according to DIN ISO 5211.



Quarter-turn gearbox dimensions

Quarter-turn gearbox A



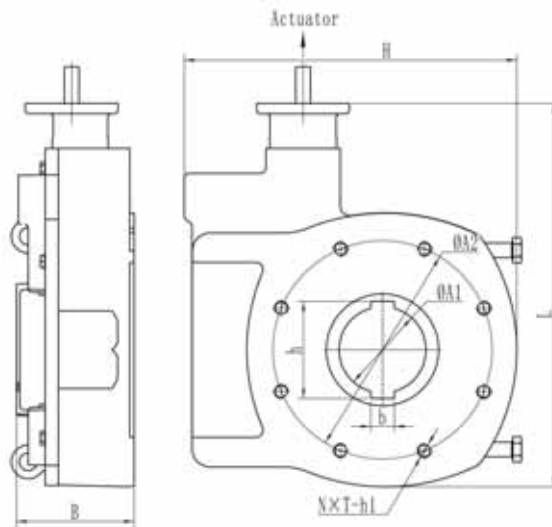
Main dimensions

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 B



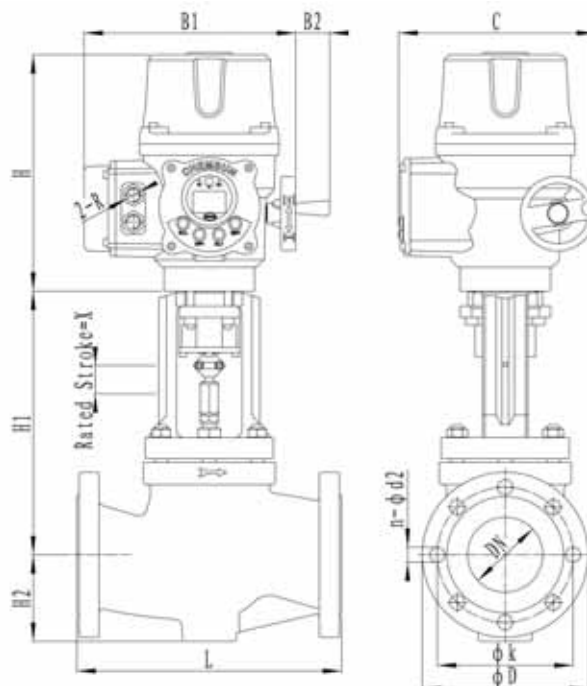
Main dimensions

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.

CSL-G01Series Linear E-Actuators (With SAMSON type 3241 Globe control valve)



Main dimensions

Unit:mm

DN	L	H1		H2		B1	B2	H	C	R	∠	
				Cast St.	Forg.St.							
15	130	220		44	53	281	45	305	257	M20×1.5	15	
20	150				70							
25	160											
32	180			72	92							
40	200				98							
50	230											
65	290	260		98	—			430			315	60
80	310				128							
100	350	350		118	—							
125	400	360	380 ¹⁾	144								
150	480	390	415 ¹⁾	175								
200	600	—		235								
250	730			260								
300	850			480								

SAMSON Type 3241 Globe control valve Flange dimension

(Unit: mm)

DN		15	20	25	32	40	50	65	80	100	125	150	200	250	300	
PN6	D	80	90	100	120	130	140	160	190	210	240	265	320	375	440	
	k	55	65	75	90	100	110	130	150	170	200	225	280	335	395	
	n	4	4	4	4	4	4	4	4	4	8	8	8	12	12	
	d2	11	11	11	14	14	14	14	18	18	18	18	18	18	18	22
PN10	D	95	105	115	140	150	165	185	200	220	250	285	340	395	445	
	k	65	75	85	100	110	125	145	160	180	210	240	295	350	400	
	n	4	4	4	4	4	4	8	8	8	8	8	8	12	12	
	d2	14	14	14	18	18	18	18	18	18	18	18	22	22	22	22
PN16	D	95	105	115	140	150	165	185	200	220	250	285	340	405	460	
	k	65	75	85	100	110	125	145	160	180	210	240	295	355	410	
	n	4	4	4	4	4	4	8	8	8	8	8	8	12	12	12
	d2	14	14	14	18	18	18	18	18	18	18	18	22	22	26	26
PN25	D	95	105	115	140	150	165	185	200	235	270	300	360	425	485	
	k	65	75	85	100	110	125	145	160	190	220	250	310	370	430	
	n	4	4	4	4	4	4	8	8	8	8	8	8	12	12	16
	d2	14	14	14	18	18	18	18	18	18	22	26	26	26	30	30
PN40	D	95	105	115	140	150	165	185	200	235	270	300	375	450	515	
	k	65	75	85	100	110	125	145	160	190	220	250	320	385	450	
	n	4	4	4	4	4	4	8	8	8	8	8	8	12	12	16
	d2	14	14	14	18	18	18	18	18	18	18	26	26	30	33	33

Note : According to DIN EN 1092 and DIN 2501.

CHEMSUN E-Actuators



CSR - G01 Series Rotary E-Actuator Selection type table

CHEMSUN E-Actuator		Type CSR - G01 -	X	X	X	X	X	X	X	-	X
Rotary Stroke		↓									
90°		1									
180°		2									
Milt-turn		3									
Special Angle	(On request)	9									
Explosion-proof type		↓									
Exd		1									
Non Ex		2									
Supply power		↓									
24 V DC		1									
220 V AC		2									
110 V AC		3									
380 V AC	or Special	4									
Input signal type		↓									
4 -20 mA		1									
0 -10(5) V		2									
On/off switch	(Dry contacts)	3									
Feedback signal type		↓									
Without		0									
4 -20 mA		1									
Power fail safe position		↓									
Without		0									
FC	(Fail Close)	1									
FO	(Fail Open)	2									
FL	(Fail Hold)	3									
FS	(Any wany)	4									
Max. Output torque. Nm (Gear Box A1 - B6)		↓									
NON	≤50	0									
A1	160	1									
A2	200	2									
B1	1200	3									
B2	1600	4									
B3	2000	5									
B4	4500	6									
B5	3000	7									
B6	7500	8									
Special	>7500 ---- 60000 (On request)	9									
Special Function		↓									
Standard:	- 25 ~ +80 °C	0									
Low Temp.:	- 40 ~ +70 °C	1									
Other special:	HART; FF; PID loop, Flow characteristic compensation, etc. (On request)	9									

CHEMSUN E-Actuators



CSL - G01 Series Linear E-Actuator Selection type table

CHEMSUN E-Actuator	Type CSL - G01-	X	X	X	X	X	X	X	-	X
Linear Stroke		↓								
20mm	1									
35mm	2									
85mm	3									
160mm	4									
350mm	5									
650mm	6									
Special Line (On request)	9									
Explosion-proof type		↓								
Exd	1									
Non Ex	2									
Supply power		↓								
24 V DC	1									
220 V AC	2									
110 V AC	3									
380 V AC	4									
Input signal type		↓								
4 -20 mA	1									
0 -10(5) V	2									
On/off switch (Dry contacts)	3									
Feedback signal type		↓								
Without	0									
4 -20 mA	1									
Power fail safe position		↓								
Without	0									
FC (Fail Close)	1									
FO (Fail Open)	2									
FL (Fail Hold)	3									
FS (Any way)	4									
Max. Output thrust. KN		↓								
≤2.0	0									
5.0	1									
8.0	2									
10	3									
20	4									
36	5									
45	6									
60	7									
80	8									
>80 ---- 160 (On request)	9									
Special Function		↓								
Standard: -25 ~ +80 °C	0									
Low Temp.: -40 ~ +70 °C	1									
Other special: HART; FF; PID loop, Flow characteristic compensation, etc. (On request)	9									

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.18: Actuator output shaft and connecting bracket

Ordering text 01

Rotary E-Actuator	Type CSR-G01- ...
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	FC/FO/FL/FA
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=20,35,85,150,280 mm
Max. Thrust	5 - 160KN
Supply Power	24VDC ; 24/110/230VAC (50/60Hz)
Input / Output Signal	4(0)-20mA ; 0 – 10(5)V ; Switch
Power Fail Safe Position	FC/FO/FL/FA
Valve Type	Globe Valve; Knife Gate Valve; Gate Valve...

*** Specifications subject to change without notice.



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