



TC BOX SERIES PNEUMATIC ACTUATOR



CDG Actuator Manufacturer

Pneumatic Actuator

© **CDG Actuator Manufacturer**

U.S. CDG control fluid technology company
Address: 6432 Woodrow Avenue, Detroit, Michigan, USA
Tel : +001-313-5727770
Web : www.cdg-incorporated.com
E-mail: cdginc@cdg-incorporated.com



Pneumatic Actuator

CDG Actuator Manufacturer

Tc



COMPANY HISTORY

- 1963 : Founded CDG.
- 1985 : CDG brand creation.
- 1989 : Production of pneumatic actuators, and Italy FABIA to establish acooperation.
- 1992 : With the United States FAIRCHILD cooperation, Production of electric actuators.
- 2001 : Focus on the production and assembly of CDG.
- 2005 : Production of hydraulic actuators.
- 2006 : Production of valves.
- 2011 : Oil station development and use.
- 2016 : Set up a number of representative offices in China.

ENTERPRISE PROFILE

The CDG is a famous actuator manufacturers, the company is headquartered in America's largest city, Detroit, Michigan is located in the northeastern United States, Canada, Detroit river north of Windsor an important port city. With strong industrial base and freight advantage.

CDG products have unique design, short delivery time, competitive price and excellent after-sales support. As a professional manufacturer of valves, it quickly became the industry leader.

CDG has more than 50 years experience in the valve industry. The r&d department USES these experiences to constantly design new products, improve existing products, and adapt to changing market demands and constantly improving international standards.

CDG can provide standard and non-standard solutions that can be customized according to customer needs.

CDG has created a wide range of reliable products. CDG is favored and admired by the world's leading EPC and oil and gas companies because of its high performance in extreme conditions. Its products are used in power plant, petrochemical, metallurgy, papermaking, automobile and

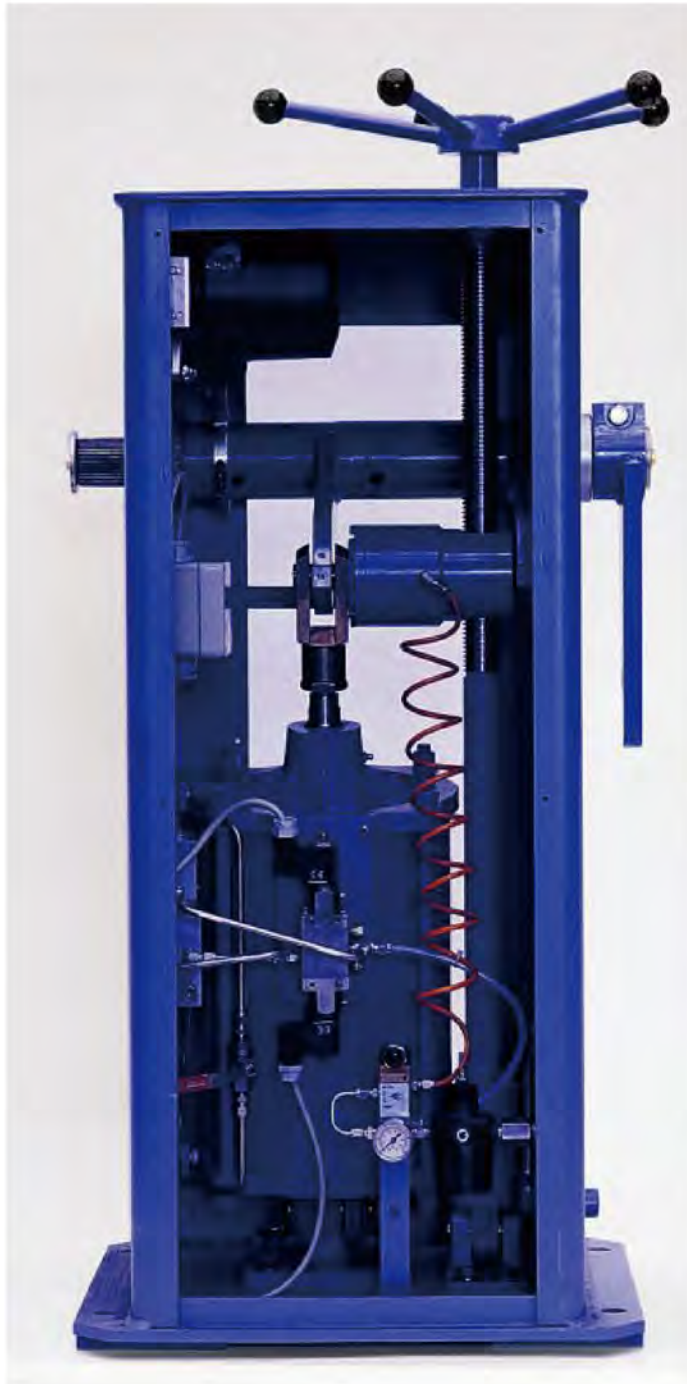
more Product certification based on customer requirements and government legislation is a guarantee of product quality. CDG USES advanced testing laboratories to ensure the durability of its products. Fire safety, high temperature and low temperature testing can be carried out under extreme conditions.

CDG good position, provide comprehensive after-sales support, fast, efficient, with unparalleled expertise. Our skilled engineers and technicians work 24 hours a day to respond to customer queries, solve problems, and provide reliable solutions. A comprehensive after-sales service creates a complete solution, customer support, covering all requirements.

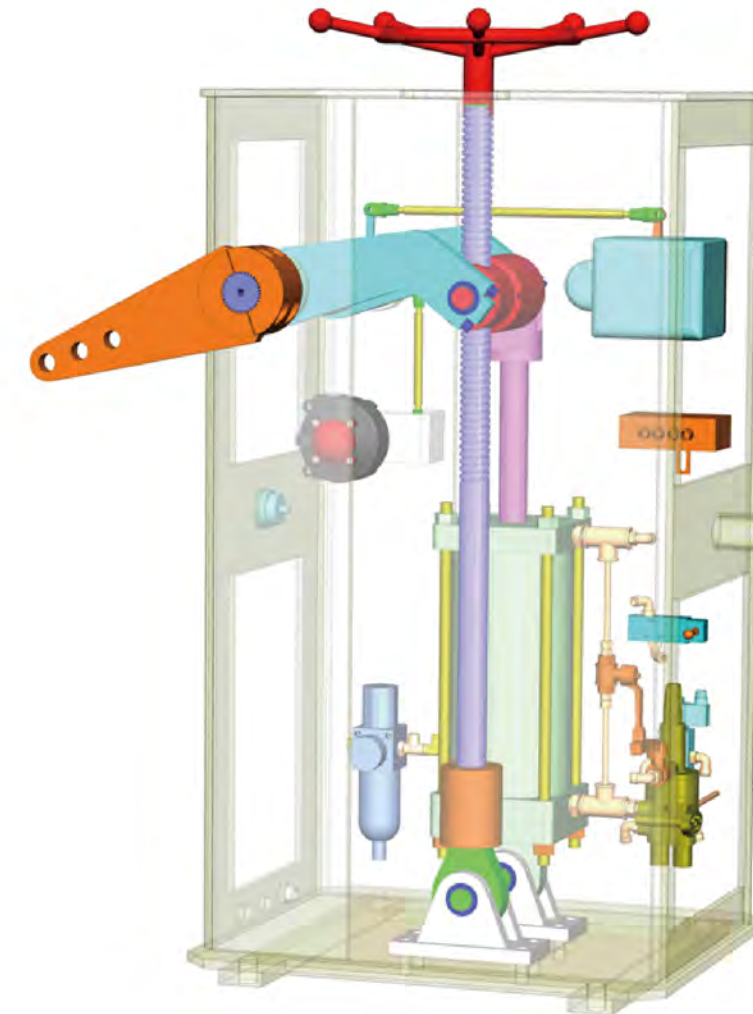
CDG is a long-term, reliable, available and cost- effective partner for your existing and new business.

CDG brand is comprehensive, including valve and oil station, pneumatic actuator, electric actuator and hydraulic actuator and other related fields. To enable CDG to meet different needs it can be sold separately, and can be matched in a complete set, so that users can reduce their worries.

TC cabinet



TC box system row actuator is composed of cylinder, control accessories and manual device. The manual device is integrated on the box shell. The steel shell plays a supporting and protective role to ensure the continuous operation of the equipment in harsh environment. The regulated actuator sets the locator by conveying electric signals, and controls the pressure of air in and out at both ends of the cylinder by the locator, thus realizing the function of adjusting the opening of the torque device by electric signals. The switch actuator controls the switch function of the torque device by controlling the power gain and power loss of the solenoid valve and controlling the direction change of the inlet and outlet air at both ends of the cylinder.



With the increasing capacity of units in modern power plants, the control moment of terminal components (dampers, fans, etc.) is required to be larger and larger, often requiring the use of actuators with a torque of more than 20,000 Nm, and at the same time expecting faster action.

TC series pneumatic actuators fully meet these requirements:

Pneumatic actuators of various sizes (maximum cylinder diameter 520mm) can adapt to different torques; reasonable accessories design and the pneumatic circuit can ensure fast response time.

The air lock system of TC series actuators ensures high safety in case of emergencies. When there is a fault in the gas source, the automatic meshing between the activation of the gas lock and the manual operation can realize the mechanical locking of the position before the fault.



The box body has two functions:

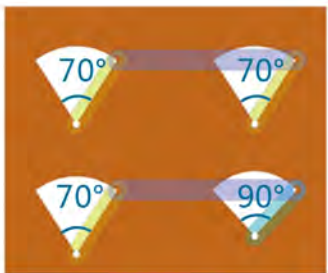
Protection and support

The space in the box can ensure the correct installation of the actuator and various accessories.
The actuator adopts SC series cylinder type actuator with CDG patented permanent lubrication system. It has a service life of less than 30 years and does not need refueling and removable panels for easy maintenance and repair.

Angle selection

Platform installation and anchor bolt fixed axle end is equipped with output rocker arm. Both ends of the axle are spline structure, which can adjust the initial position and direction of the rocker arm.
Two kinds of output angle 90 degrees and 70 degrees, solid box structure (all made of steel plate).

70 degree output angle
of actuator arm



The required angle of the to
rque equipment is 70 degrees
90 degrees required angle for
torque equipment



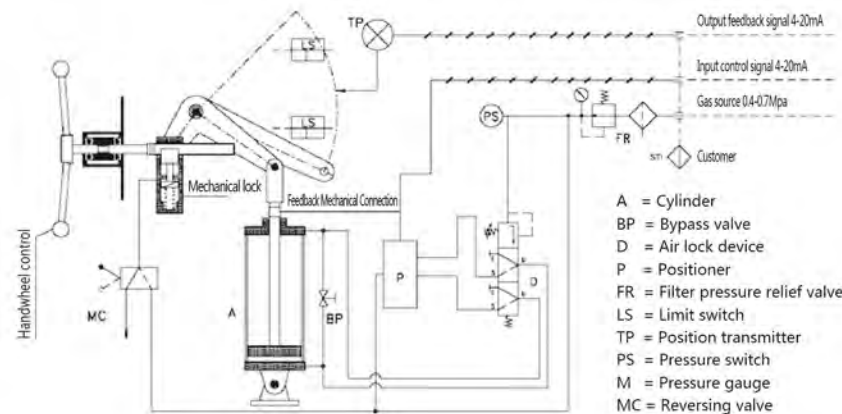
Enclosure

- Positioner
- Position feedback
- Air lock valve
- Air filter pressure relief valve
- Pressure gauge
- Spherical hinge
- Travel switch
- Solenoid valve
- Electric heater
- Pressure switch

Application

Widely used in electric power, steel, petrochemical and other industries, this series can control all kinds of valves, converters and other large torque equipment, and this mechanism can carry out a certain distance of torque transmission through connecting rods, so that it is more convenient to use and install.





Working principle

When the air source is lost, the pneumatic pressure switch connected with the air lock valve (D) loses the air source. The spring reset operation of two groups of three-way valves reaches the position of the air pipeline blocking, and the actuator maintains the position before the air source is lost. At the same time, the gas lock device can send out the "state signal" of gas loss as a general monitoring or participate in the logical control of the system.

Three-way commutation valve (MC) is in the on position in automatic control and in the closed position in manual control. The clutch is separated by air and engages with air. When the system loses the air source, the clutch engages with the handwheel mechanism automatically. Therefore, the whole system is mechanically locked in the position before the loss of gas.

If manual control is carried out by hand wheel, bypass valves (BP) need to be opened to connect the upper and lower chambers of the cylinder, and the cylinder is in a state of free movement. In addition, it is suggested to switch the three-way commutation valve (MC) to the closed position after the action of the air lock (D), so as to ensure the stable engagement of the clutch and prevent the misoperation of the air source recovery.

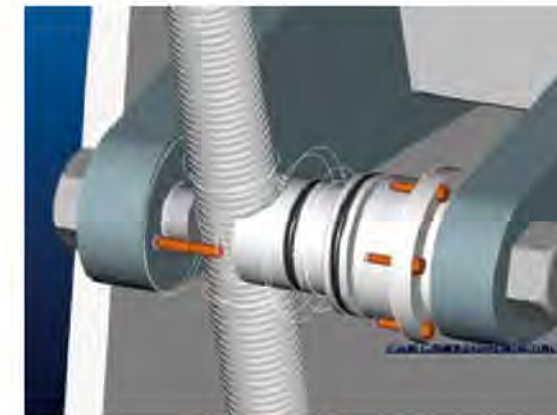
When switching from manual operation to automatic control, be sure not to cause deviation of switching position. It is suggested that only when the torque generated by the terminal regulator is converted to the pneumatic actuator in advance, the clutch can be separated again and the interference-free switching can be achieved.

CDG designs this system and has a patent for it. This system can operate with maximum reliability.

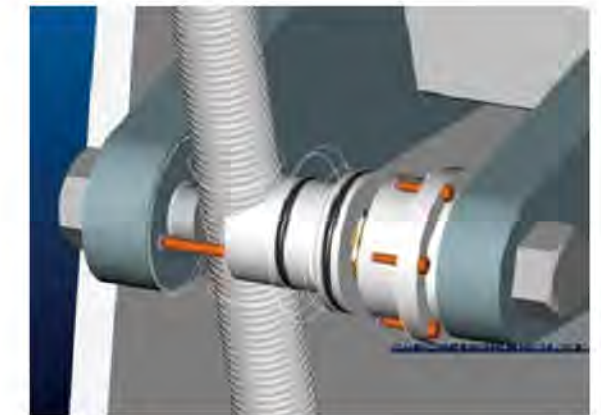
When the pressure of the air source recovers, the air lock device automatically reactivates, so the actuator can operate freely by closing the bypass (BP). By slowly reducing the control signal corresponding to the preset position of the terminal regulator, it can be determined that the actuator can fully withstand the conditions of the torque generated by the terminal regulator. Under this balanced condition, there is no load on the handwheel mechanism, and the three-way commutation valve (MC) is switched to the connecting position. The clutch is separated from the handwheel mechanism and restored to the automatic control state.

Manual device

The manual device of the box type actuator uses the hand wheel to drive the screw to rotate, and the power arm is controlled to move up and down. The disengagement and engagement of the manual device are controlled by a cylinder with a spring return, and the gas is disengaged and the air is lost. Note: After the gas loss operation, the manual reversing valve must be switched to the manual position to prevent the gas source from suddenly recovering from malfunction. See the instructions for detailed operation.



Clutch release



Clutch engagement

The torque is referenced to a 70 degree operating angle, which is the standard output angle of the rocker in the TC Series. An angle of 70 degrees is considered to be the best effective control of the angle of the baffle, butterfly valve and other terminal adjustment mechanisms. Therefore it is recommended not to exceed this angle when connecting to the final control unit

Only for switch actuators, it is recommended to use a larger operating angle of 80 or 90 degrees for the terminal adjustment mechanism. In general, according to the required reliability, it is recommended to select the maximum force distance from 50% to 100% of the actual required force distance, thus ensuring the operation of the actuator and also avoiding the influence of the pressure drop of the air source

In addition, if the actuator is equipped with an air lock device that locks the actuator in the final position, it is necessary to determine that the set point pressure of the air lock is higher than 10-20% of the limit pressure that can ensure the required torque.



Technical parameters

Sensitivity	0.25%
Gas source requirement	Dry clean instrument air
Linear	1%
Air pressure	0.24-0.7Mpa,0.14-0.6Mpa (Smart locator)
Ambient temperature range	-20°C~80°CStandard (High temperature and low temperature options)
Air source interface size	1/4"NPT,1/2"NPT (Special customizable)
Electrical interface size	3/4"GF,1"GF
Output angle	0°~70°、 0°~90°
Command signal input	4~20 mA
Position transmitter output	4~20 mA
Position transmitter	Two-wire system24VDC
Locator	TZID-C or customer requirements
Limit switch	DC 24 V Mechanical or non-contact
Actuator protection rating	IP 66
Joints and pipes	Copper nickel plating, stainless steel
Spray paint	Carbon steel spray epoxy

Selection table

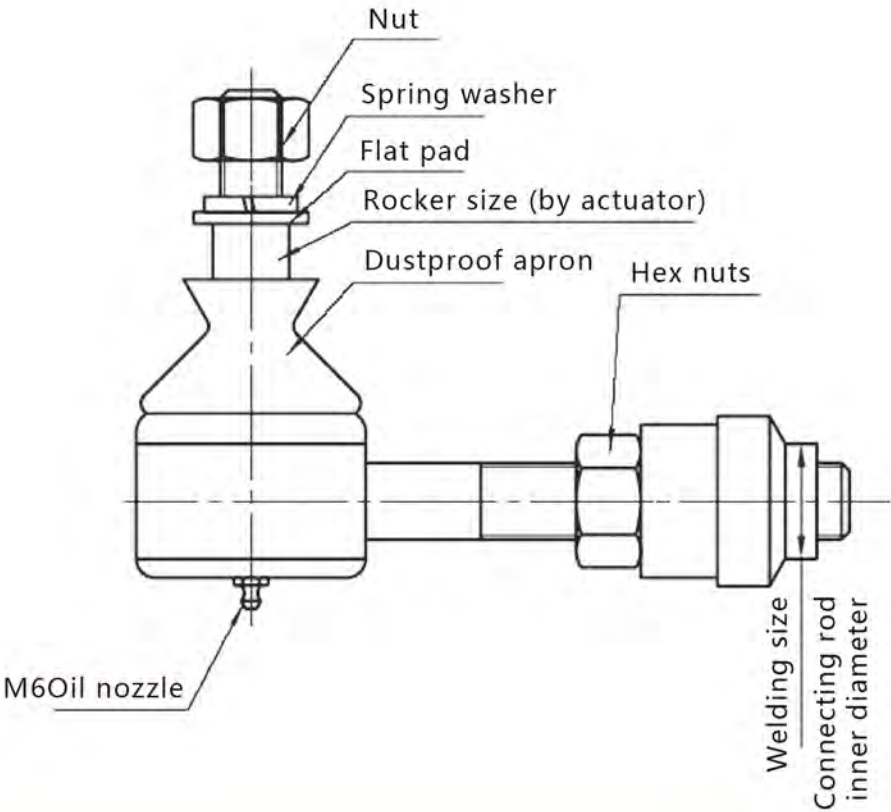
Executive agency		Theoretical value with damper flap (Nm)				Schedule time		weight
model	Rocker output angle	70°		90°				
Bore diameter/stroke		Minimum	maximum	Minimum	maximum	conventional	fast	Kg
TC 63/125	90	117	142	83	117	0.5	...	30
TC 100/100	90	258	317	183	258	1.5	1	37
TC 100/200	70	517	633	358	508	3	2	103
TC 125/200	70	817	1000	575	808	3.8	2.5	108
TC 125/250	70	1014	1239	717	1007	2.5	...	153
TC 160/200	70	1341	1638	942	1333	3	...	163
TC 160/300	70	2007	2464	1413	2000	4.5	2	260
TC 200/300	70	3174	3891	2239	3159	7	3.5	280
TC 260/300	70	5399	6616	3804	5377	12	6	305
TC 260/400	70	7196	8819	5072	7167	16	8	520
TC 330/400	70	11790	14442	8304	11739	...	13	620
TC 390/450	70	19090	23370	13160	18810	...	30	1550
TC 420/450	70	20464	24551	14116	19957	...	36	1600
TC 520/450	70	33610	41190	23320	33140	...	45	1700

Material

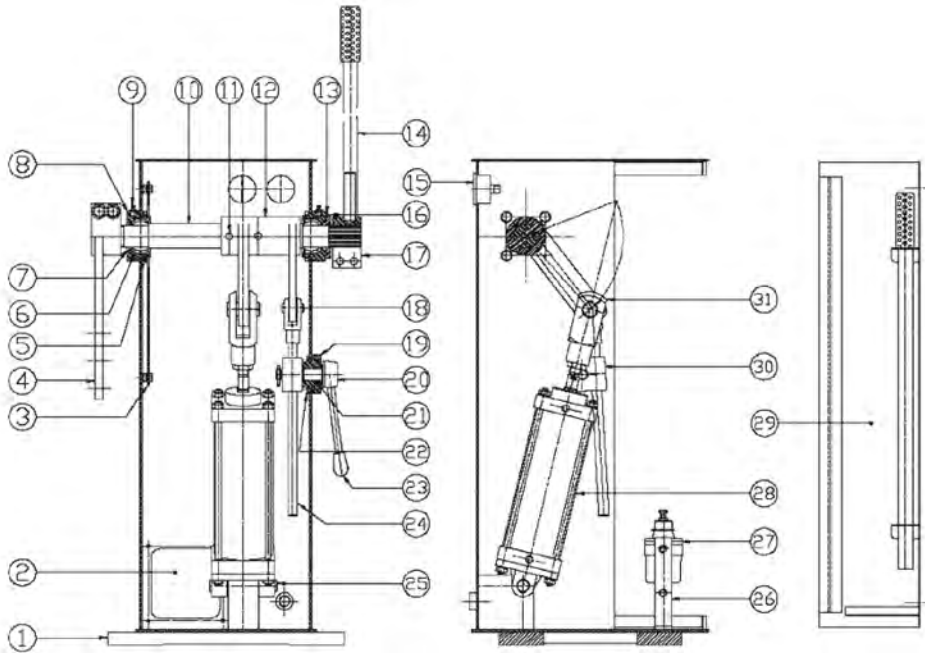
Part Name	Material	Part Name	Material
Box	Carbon steel spray	Cylinder	63-125 aluminum alloy/160-520 carbon steel
Output arm	Carbon steel spray	Piston rod	40Cr chrome plating
Spindle	Alloy steel 38NiGrMo4 thermalprocessor	Cylinder piston	Aluminum alloy
Screw	Alloy steel 38NiGrMo4 thermalprocessor	Base	Carbon steel spray
Bushing	Aluminum bronze	Rocker arm	Carbon steel spray
Hand wheel piston	Aluminum bronze	Spherical hinge	alloy steel
clutch	3Cr13	Composite bearing	304+PTFE

Execute an organization chart

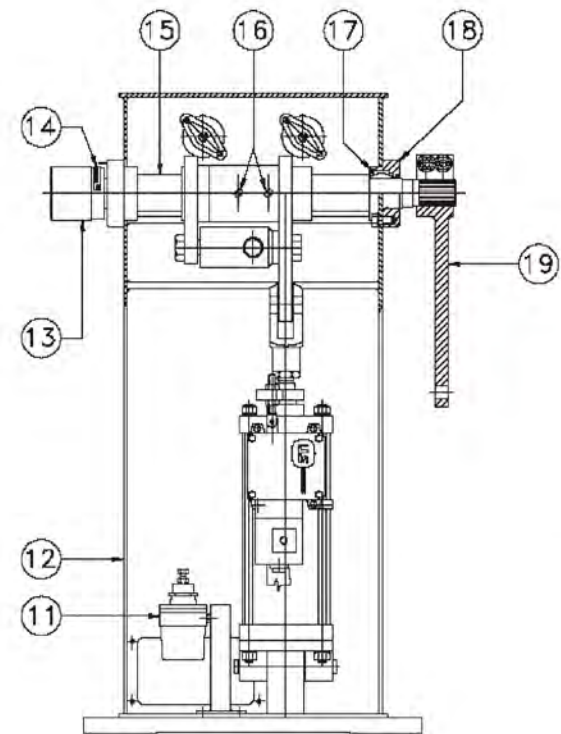
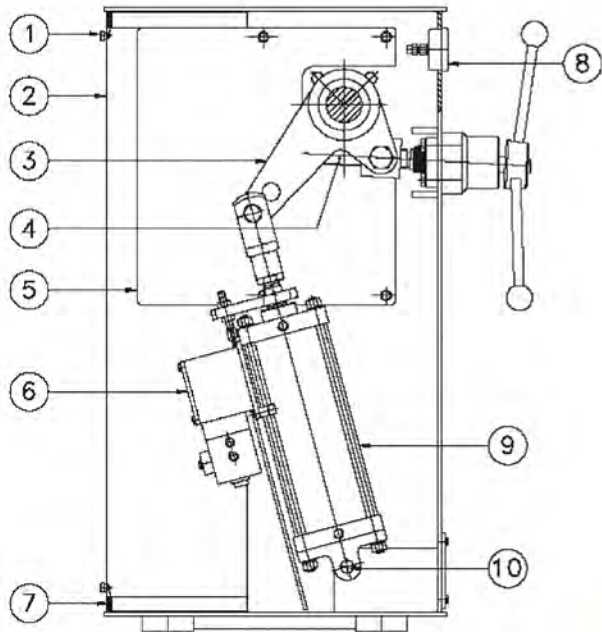
The spherical hinge and connecting rod



Actuator model	Hinge type (rocker size)	Connecting rod inner diameter-recommended wall thickness
TC 63/125 - 100/100	Φ 16- 12	DN30- is greater than 6
TC 100/200 - 125/200	Φ 16- 15	DN30- is greater than 6
TC 125/250 - 160/200	Φ 20- 20	DN30- is greater than 6
TC 160/300 - 200/300 - 260/300	Φ 25- 20	DN53- is greater than 8
TC 260/400 - 330/400	Φ 30- 30	DN53- is greater than 8
TC 390/450 - 420/450 - 520/450	Φ 45- 40	DN69- is greater than 10
unit:mm		

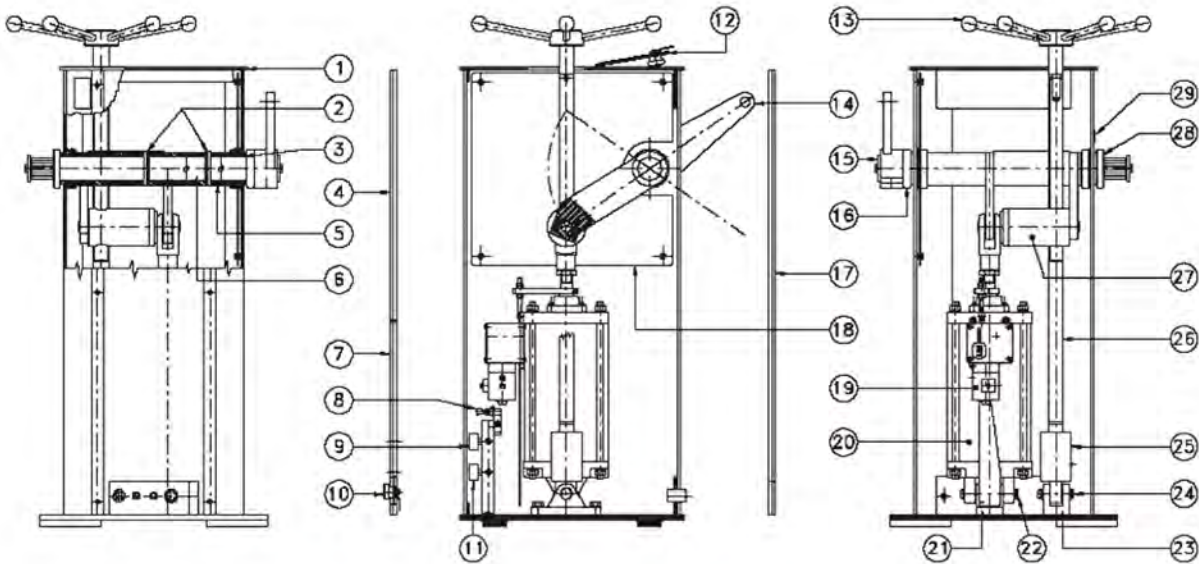


TC 63/125-100/100-100/200-125/200			
Serial number	Name	Serial number	Name
1	Base	16	Indicator panel
2	Interface board	17	Manual Control Hub
3	Liner	18	U-shaped clamp
4	rocker arm	19	Locking end support
5	Internal leverage	20	Locking pin shaft
6	Spherical bearing	21	Seal ring
7	Dustproof ring	22	screw
8	Bearing sleeve	23	Locking rod
9	Oil mark	24	Locking shaft
10	axis	25	Cylinder Bearing
11	Elastic pin	26	Air separation bracket
12	Spindle sleeve	27	Filter
13	Dial	28	Cylinder
14	Manual lever	29	door
15	Working gas pressure gauge	30	Guide block
		31	U-shaped clamp



TC 125/250-160/200

Serial number	Name
1	Door lock
2	Backdoor panel
3	Internal leverage
4	Worm screw
5	interface board
6	Positioner
7	Shim
8	Working gas pressure gauge
9	Pneumatic actuator
10	Cylinder base
11	Filter
12	Box body
13	Axle end connection
14	Dial
15	principal axis
16	Axle pin
17	Limiting ring
18	Spherical bearing connection
19	rocker arm



TC 160/300-200/300-260/300
TC 260/400-330/400
TC 390/450-420/450-520/450

Serial number	Name	Serial number	Name
1	Box frame	16	Diaphragm
2	pin	17	Backdoor panel
3	Axle lining	18	Bearing
4	Front Fixed Plate	19	Positioner
5	Inner sleeve	20	Pneumatic actuator
6	axis	21	Cylinder base
7	Front door panel	22	pin
8	Manual switch	23	Screw base
9	Signal Gas Source Pressure Gauge	24	pin
10	Door lock	25	Articulation device
11	Working gas pressure gauge	26	Handwheel connecting rod
12	Open the door	27	Mechanical locking device
13	handwheel	28	Pointer
14	rocker arm	29	Dial
15	Gasket		