GREATORK®

GAS OVER OIL ACTUATOR

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gas
over oil actuator

Our Gas over oil Actuator is designed on the basic of our experience on electric actuator

Gas over oil Actuator

Company Introduction

Tefulong (Shanghai) Technologies Co., Ltd. is one of the largest intelligent valve actuator manufacturer in China. Our electro-hydraulic actuator covers the shortage of traditional pneumatic and electric actuator, which can satisfy the industrial process automation requirement of large-scale automatic control system.

After years of effort, with various unique industry technology patent, our actuator has become more and more clients' first choice.

Tefulong (Shanghai) Technologies Co., Ltd fully use technology, manpower and city brand effect of Shanghai, to attract more and more excellent talents and establish a sophisticated R&D and market center. We build a new production base in Shanghai Lin'gang industry zone, to expand production capacity and accelerate enterprise development.

Our Shanghai new production base also get great support from Shanghai government, Pudong area and Lin'gang management committee, and has been assessed as Shanghai Strategic Emerging Industry Program by government.

We have a team of qualified, experienced and talented researchers & engineers from a wide variety of backgrounds in R&D center. We are committed to keeping efforts to ensure that our actuators are the simplest to operate and the highest reliable to work with.

Our mission is to provide the industry with high-quality and cost-effective actuators and maximize customer's value. We persist on continuous improvement and product innovation to keep our competitiveness.

Actuator Certificate



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Actuator introduction

- Directly use natural gas pressure from pipeline or its own high pressure nitrogen cylinder as power source
- Drive hydraulic device to open/close valve
- Precise valve position measurement
- High precision and reliability pressure switch
- Infrared setting control technology
- Historical records and downloads
- Self-diagnosis, self-testing and free configuration functions

Actuator application

- Suitable for quarter-turn valves
- Typical application on gas transportation
- Line break protection of emergency pipeline
- Two-way remote control of venting valve in workstation
- High/low pressure shutdown of river crossing valve room
- Station entrance/exit protection of station by-pass valve
- Actuate Ball valve size: DN100-DN1400

Actuator characteristics

- Output torque range: 2KNm ~ 300KNm
- Power gas supply pressure range: 0.6Mpa ~ 12Mpa
- Use natural gas from pipeline or its own nitrogen cylinder as power source
- External adjustable stop nut can absorb all torque to protect valve
- High pressure driver no need to reduce valve or decompression valve,
- which can avoid blocking pipeline caused by decompression, expansion and frosting
- OLED screen, Chinese/English menu display
- Low power consumption design, electronic unit power consumption lower than 0.24w.
- solar energy power supply technology-no need of external storage battery,available for one year electricity consumption.
- Store more than 1 million high & low pressure, pressure drop rate, alarm and login info records.
- Fieldbus: Modbus-RTU, Profibus-DP etc.

Gas over oil Actuator

Available for data download through infra-red and WIFI

Available for mobile App monitoring

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Comparation of
gas
Over Oil actuator

Comparing Contents	Greatork	Chinese Domestic Brand	Similar Products Abroad
Ambient Temperature Range	-40℃ ~ 85℃	-40℃ ~ 85℃	-30℃ ~ 85℃
Power Supply	+12VDC/+24VDC	+24VDC	+24VDC
Drive mode	Scotch Yoke	Scotch Yoke	Scotch Yoke/blade
Gas control and electronic control unit layout	Separated	Separated	Separated
Gas hydraulic Tank and gas storage tank	Seamless steel tube hot spinning forming without welding	Welding	Welding
Storage Battery	Solid state lithium iron phosphate battery, has a long service life, no maintenance	Lead-acid Battery	Lead-acid Battery
Power Consumption	0.24W	0.42W	-----
Continuous Use in Rainy Day	55 days(a year as option)	35 days	About 10 days
Solenoid Valve	20Mpa solenoid valve, SIL3, <3W	15Mpa self-made solenoid valve	10Mpa solenoid valve
Display	OLED Low Temperature all-weather Display	OLED Low Temperature all-weather Display	LCD Display
Main interface display	Selectable	-----	Not Selectable
Setting Method	Infra-red Setting Tool and non-penetrating type Button Setting	Penetrating Type Button Setting	Penetrating Type Button Setting
Pressure Sensor	3 groups	1 group	1 group
Language	Chinese/English	Chinese/English	English
Protection and explosion proof classification of electronic control box	IP65/ExdIIBT4	IP65/ExdIIBT4	IP65/ExdIIBT4
Explosion-proof power switch	The control case can be opened in maintenance occasion	No	No
Memory capacity	6MB(max. 4000 events)	More than one million data <512KB	512KB(max. 1000 events)
Pressure Variate Record	Valve Position, Pressure, Pressure Drop Rate, Pressure Fluctuation, Temperature, Login info	Valve Position, Pressure, Pressure Drop Rate, Temperature, Time	Valve Position, Pressure, Pressure Drop Rate, Temperature, Time
Real Time Data Record	Dynamic memory, real time record 256 data	No instruction	Dynamic memory, real time record 256 data
Data Download	Infra-red and RS485 interface	Infra-red and RS485 interface	RS485 interface
Data communication	Wireless communication data transmission , Monitoring by service management system, App real time query	GSM alarm	No
Data Fluctuation Record	Pressure fluctuation ± 0.01MPa-20MPa, pressure drop rate 0.01MPA-20MPa/m, parameter can be set	Pressure fluctuation0.5Mpa record data, Pressure drop rate 0.2MPA-20MPa/m, parameter can be set	Pressure drop rate 0.2MPA-20MPa/m, parameter can be set

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Transmission output	Pressure/Pressure drop rate can be 4-20mA feedback	No	No
System Self-diagnose	Detect available signal of button status, pressure sensor, position sensor , etc.	No	No

Function

- Detect gas pressure in pipeline
- Record gas pressure change in pipeline
- Auto close valve
- Lock valve after auto close (prevent open)
- Remote control(open/close valve)
- Local manual/gas/hydraulic control(open/close valve)
- Remote wireless APP monitor

Electric movement trigger condition

- When pressure is lower than set low pressure shut down value(can be set at site)
- When pressure is higher than set high pressure shut down value(can be set at site)
- When pressure drop rate is higher than the pressure drop rate shut down value (can be set at site)

Gas over oil Actuator

Basic structure

Gas over oil actuator mainly consist of scotch yoke drive part, gas hydraulic tank, gas storage tank, manual emergency module, air control unit, line break electronic unit and signal feedback unit.

1.Scotch yoke drive part: scotch yoke drive part mainly consist of scotch yoke, sliding block, pin, guide block, guide bar, piston rod and oil tank, it's the main part of actuator, the output torque parabola curve is identical to ball valve open/close movement, with high reliability and zero leakage feature.

2.Gas hydraulic tank: it includes open valve gas hydraulic tank and close valve gas hydraulic tank, the upper part is gas power resource, lower part is hydraulic oil.

3.Gas storage tank: when pipe gas pressure drop, the high pressure power gas resource in the tank will used to open/close valve.

4.Manual emergency module: it is used to open/close valve or commissioning when actuator has no gas power resource, it is simple structure and easy to operate.

5.Air control unit: it is consist of gas control valve, pressure relief valve, solenoid valve and air control module, mainly open/close valve by control gas power resource flow direction.

6.Line break electronic unit: Real time monitor pipeline pressure and pressure drop rate, if pressure or pressure drop rate exceed set value, the electronic part will send signal to actuator to open/close valve.

7.Signal feedback unit: Indicate and feedback valve position.

Main part

1.Gas storage tank

Applicable working temperature is -20 ℃ to +85 ℃ (optional -40 ℃ to +80 ℃), equipped with easy replaceable pressure gauge and safety relief valve. The capacity can support valve operate for 2 full stroke.

2.Scotch yoke hydraulic cylinder

The hydraulic cylinder is piston driven, tighten sealed, no internal leakage, high output efficiency and special material sealed, which can make sure no stuck under temperature -40℃ to 80℃ .

3.Air control unit

Modular integration, low failure rate, easy operation, space saving, silencer at vent to reduce noise, max design pressure 16Mpa.

4.Hydraulic manual pump

Pump body utilizes electrophoresis and anticorrosive processing. The built-in reversing valve and safety valve are used for actuator open/close valve. The pump is simple structure and easy operate, full stroke need operate less than 400 times(1-8 minutes).

5.Low consumption solenoid valve

Use imported low consumption and high efficiency explosion-proof solenoid valve, power consumption is lower than 3w, SIL3 approved.

6.Flow control valve

Built-in design, independently adjusted operation time of open/close valve, hydraulic oil filtration.

Line break protection unit

Electronic unit consist of CPU, sensor, battery, solar energy panel, solar energy controller, surge protector, fuse protector, explosion proof control box, etc.

Display and parameter setting

LS control box use OLED display, and allow user configuration or data display. The non penetrating type push buttons, including (︽) Increase (-) Enter (︾) Decrease, are used for adjust and set parameter. Besides that, user can use infra-red setting tool to set parameter. There are 3 LED indication light on the panel, green-normal, yellow-set parameter, red-alarm.

Pressure inspection

3 groups of pressure sensors can real time detect pipeline pressure, 3 group of pressure input signal can be configured, make sure the reliability of pressure sampling system. Pressure sensor has features like high accuracy, long operating life, low power consumption, no delay and good repeatability.

Transmission output

Parameter transmission 4-20mA can select pressure transmission output or pressure drop transmission output.

Indication contacts configuration

6 groups 30VDC/5A(or 250VAC/5A) relay output, and output state can be configured freely. Output states consist of valve fully open, fully close, valve control overrun, fluctuation overrun, battery alarm, control alarm, power failure alarm, temperature alarm, valve position alarm, sensor alarm, etc.

Diagnostic function

Detect storage battery voltage in control box, solenoid valve voltage and current, sensor working status, power supply status, and whether the system has been rebooted or not.

Expolsion proof power switch

The side of explosion proof control box has explosion proof power switch. Under the condition of maintenance situation, close power switch, and then open control box.

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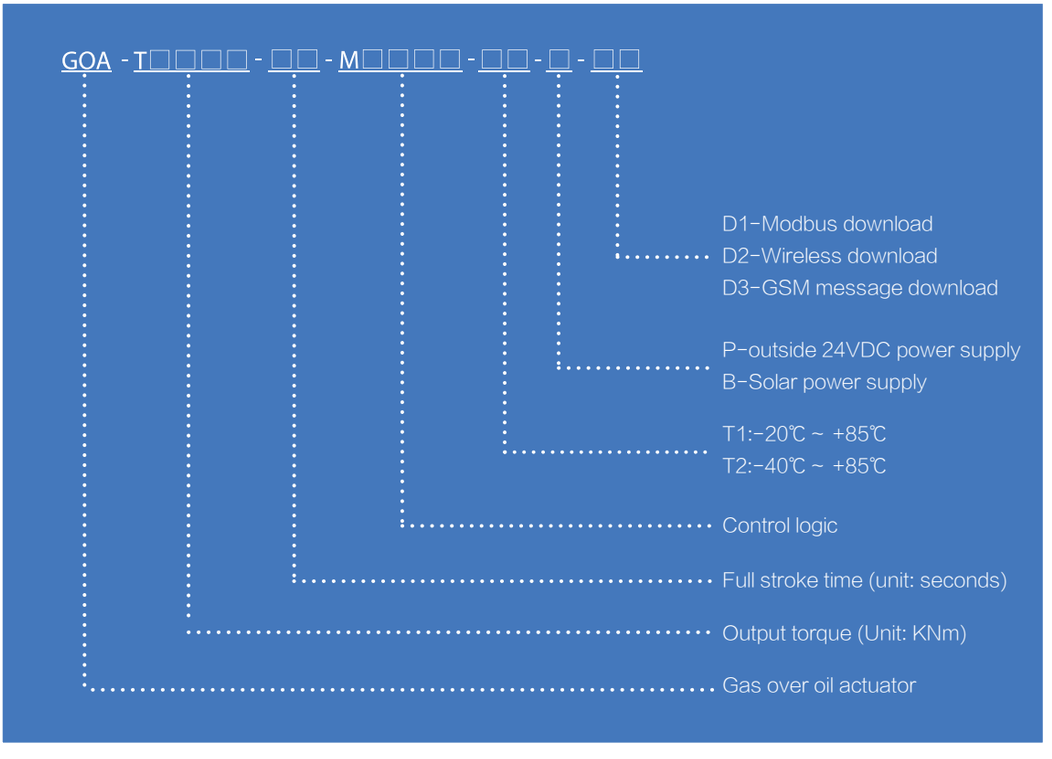
Parameter and setting

Item	Parameter	Unit	Set Range	Default value	Set principle
1	The set value of low pressure auto shut down	Mpa	0.00-29.99	3.00	Higher than actuator minimum operation pressure, lower than pipeline lowest operation pressure
2	The set value of high pressure auto shut down	Mpa	0.00-29.99	9.00	Generally it is 90%-110% of pipeline design pressure
3	The set value of valve control pressure drop rate auto shut down	Mpa/M	0.01-9.99	0.30	Under valve control, pressure drop rate exceed the set value
4	The set value of pressure drop rate sampling auto shut down	Mpa/M	0.01-9.99	0.30	When sampling data, pressure drop rate exceed the set value
5	Pressure rise variation value	Mpa	0.01-29.99	3.0	Output alarm by relay, when pressure rising value exceed set value
6	Pressure drop variation value	Mpa	0.01-9.99	3.0	Output alarm by relay, when pressure dropping value exceed set value
7	Auto shut down event delay	Sec	0-999	10	Set enough delay time to avoid instant interference
8	Valve shut down time	Sec	0-999	30	Longer than the shut down time under the lowest working pressure
9	Data sampling event delay	Sec	0-99	5	Data sampling interval time setting
10	Threshold value	Sec	0-100%	100%	Note 1
11	Data sampling function	Bool	On/off	On	Set when pipeline need collect abnormal pressure data
12	Auto shut down function	Bool	On/off	On	Set when need equipment auto shut down function
13	Event storage status	Bool	Circ/not Circ	Circ	Note2
14	Low battery alarm	V	0-20.0	10.8	Low battery alarm percentage setting is 80%-100% of working voltage
15	Production date	Y/M/D-H/M	2000/01/01-00.00	2000/01/01-00.00	Actuator production date
16	Battery replace date	Y/M/D	2000/01/2099/12/31	2000/01/2012/12/31	Last battery replace date Next battery replace date

17	Series number	LS- num char	Max 12 char	LS-2000-01	Maximum 12 characters

Note 1: When reach valve control exceed limit delay time, exceed time ⩾ (sampling points xThreshold value percentage), then electronic part alarm, and close valve.
Note 2: Circulation = when event storage is full, new event will displace the earliest data (first one), next event will displace the second group.
No circulation= when event storage is full, sampling function stop, “clear memory” control can re-start sampling function. Valve control function is maintain effective.

Model System



Innovation and advantage

- Gas storage tank integrity
- Air control integrity distribution valve
- Separate pressure transmitter and electronic part
- Separate air control and solenoid valve
- choose two from three pressure transmitters
- Low power, <0.24w
- APP monitor

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