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YUGE 禹格

YG/YGM

Smart Non-Intrusive Electric Actuator



上海禹格工业设备有限公司

SHANGHAI YUGE INDUSTRIAL EQUIPMENT CO.,LTD

2023

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COMPANY OVERVIEW

YUGE is part of the leading manufacturers of electric actuators for automating industrial valves, which include YG/YGK multi-turn/quarter-turn electric actuator and YGT/YGKT split multi-turn/quarter-turn electric actuator. Customer from the most diverse industries, such as metallurgy, nonferrous metals, power, chemical process, and petroleum, rely on us for innovative, high quality and dependable solutions for flow control. We help customer around the world to improve efficiency, reduce emissions, minimize their environmental impact and assure safety.

With years of professional expertise and workmanship, we work closely with our customers to understand their needs and problems. The innovative approach to research and development activities throughout YUGE ensures that we offer cutting-edge products for every application. We solve customer challenges and develop new solutions to create successful and reliable operations.

Our goal is to contribute to the industrial world with our strong competitive edge and excellence.



PRODUCT SERIES

YG/YGM

Smart Integrated Multi-Turn Electric Actuator

In direct mechanical connection to a valve (such as a gate valve or a globe valve) through the flange plate on the output shaft, the actuator can run multiple turns continuously with a maximum torque of 3500 N.m.



YG/D And YGM/D

Smart Combined Multi-Turn Electric Actuator

This high torque actuator is composed of an integrated multi-turn actuator and a bevel gear reducer. It connects to a valve (typically a high-torque one, such as a globe valve or a gate valve) through a bevel gearbox as the mechanical joint. The torque range is from 300 N.m to 15,000 N.m.



YGML

Linear Stroke Electric Actuator

The linear stroke electric actuator is composed of a integrated multi-turn actuator with a T-shaped copper nut and screw rod and a support unit. It is mainly used in conjunction with valves moving linearly, and can perform continuous regulation. (Such as globe valves,regulating valves and Membrane valves) The maximum regulation thrust can reach 105 kN.



YGK/YGKM

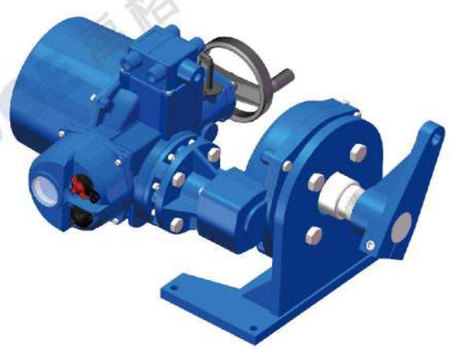
Smart Integrated Quarter-turn Electric Actuator

YGK/YGKM electric actuators are easy to use with rotational valves, such as butterfly valves, ball valves, plug valves and dampers. They have a simple design, a compact structure and a stable performance. They can output angular displacements from 0 to 90 degrees. Users can also add optional parts or various functional configurations to suit different technical process control needs. The maximum torque is 1000 N.m, but it can reach 2500 N.m with the reducer.









YG/W or YGM/W

Smart Combined Quarter-turn Electric Actuator

The worm gear speed reducer converts continuous multi-turn motion into a limited angle of rotation. It is suitable for rotational valves that require large torque, such as butterfly valves, ball valves, plug valves and dampers. The output angle of the worm gear box can vary from 0 to 90 degrees. The maximum torque can reach 450,000 N.m.

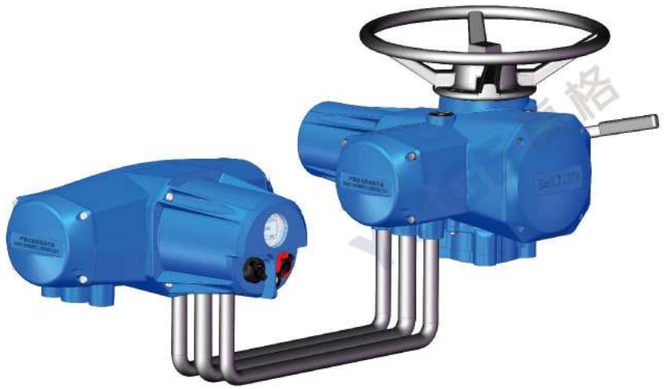




YGT/YGMT or YGKT/YGKMT

Smart Split Multi-Turn /Quarter-turn Electric Actuator

The split multi-turn/quarter-turn mechanical device, characterized by its compact structure and a maximum safe splitting distance of 30 meters, is designed to operate effectively in challenging environments encompassing high/low temperatures, high humidity or intense vibrations. The cable connection is straightforward, offering both explosion-proof and waterproof capabilities.

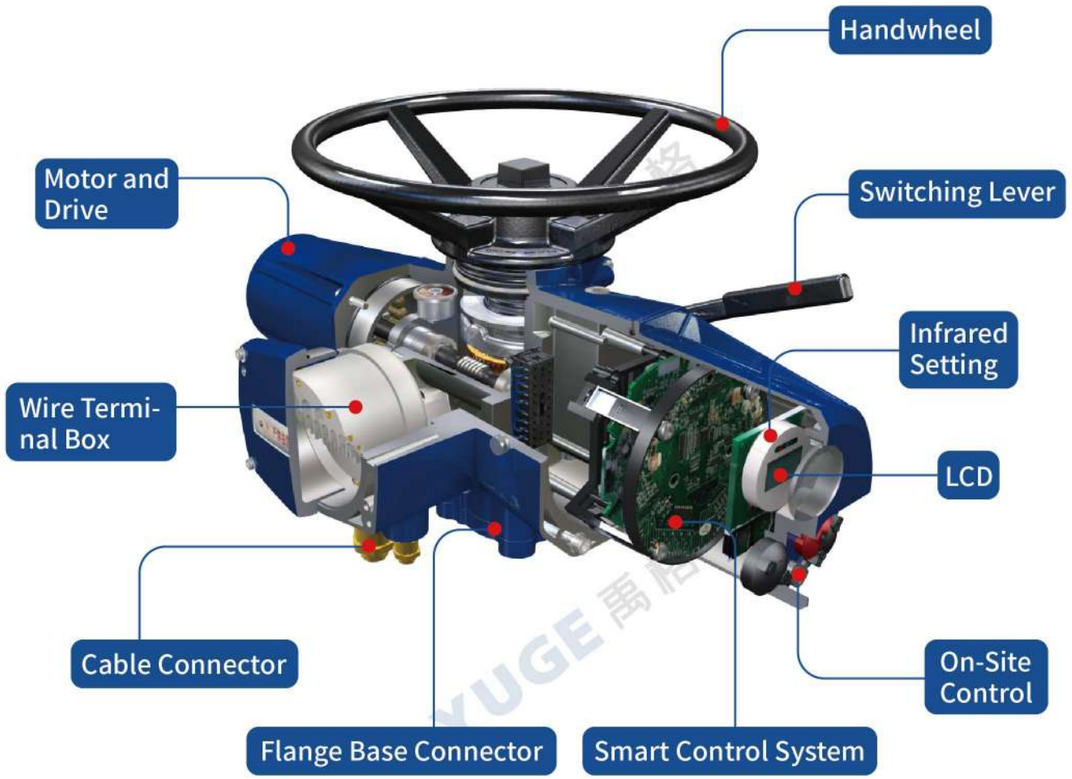




PRODUCT DESIGN

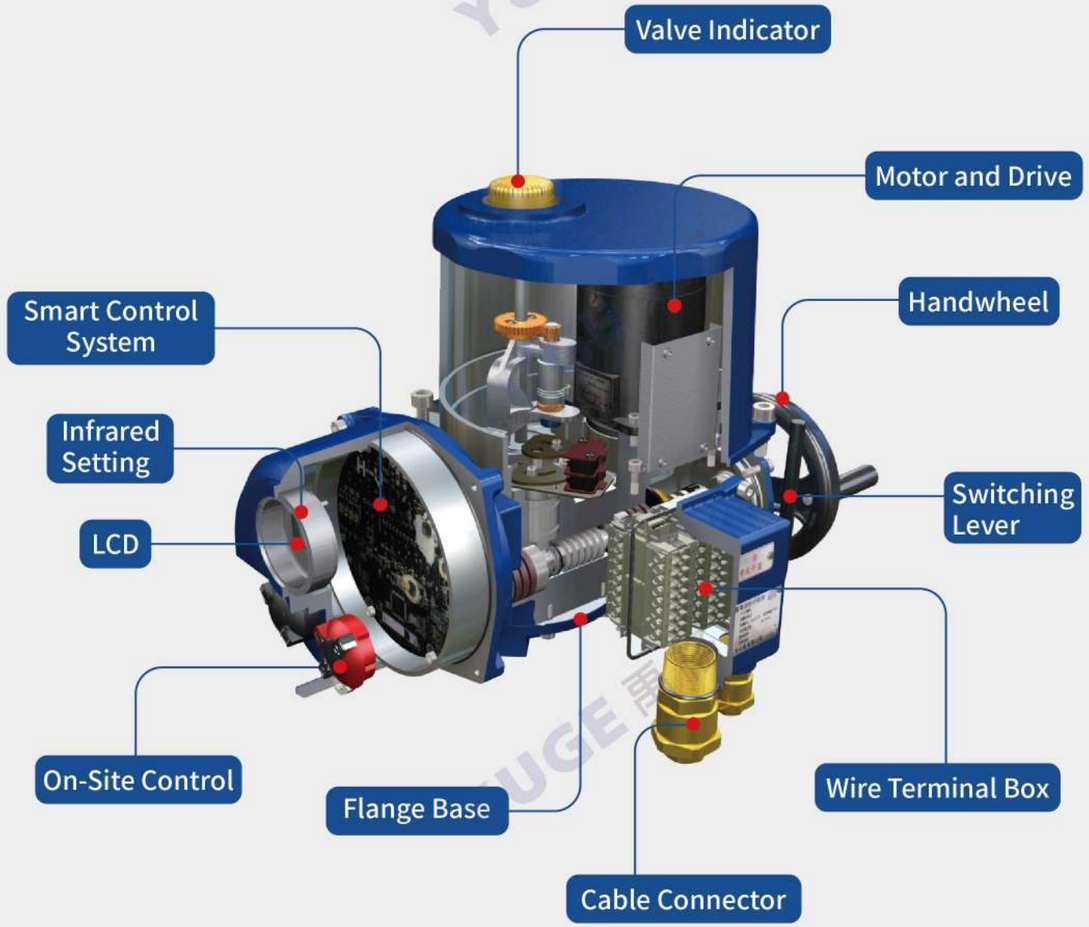
YG

Multi-Turn Structure



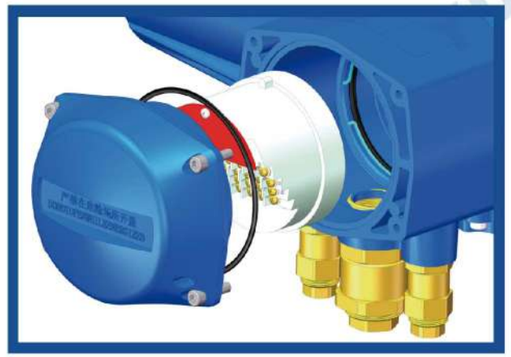
YGK

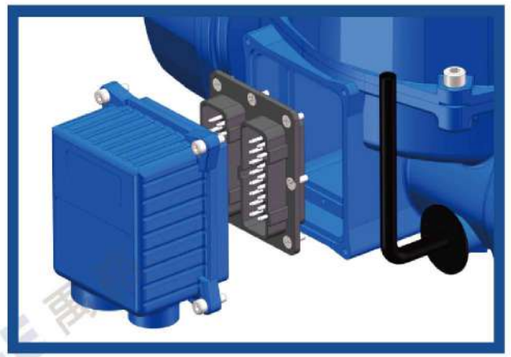
Quarter-turn Structure



PRODUCT DESIGN

> **Protection rating:** IP68. In order to ensure the reliable operation of electric parts, the housing features a double-sealed and double-protection structure, which is waterproof, dustproof, and airtight.





> **Explosion-proof rating:** Ex dbIIC T4 Gb, compliant with the standards of JB/T8219-2016, GB/T3836.1-2021 and GB/T3836.2-2021.

> **An quarter-turn actuator with two rotation ranges for:** 0° - 90° and 90° - 300°.

> A linear actuator with 0.5% to 1% accuracy of the valve position, through a trapezoidal lead screw.

> A multi-turn absolute encoder to collect valve position and automatically store the power loss data of main power as a permanent record.

> Real-time valve position display even when the main power is disconnected, by rotating the knob.

> A built-in high-capacity rechargeable battery that can automatically charge when the main power is connected. The excellent durability allows it to last long and does not need replacement.

> Electronic linear torque measurement with high reliability and minimal error.
Hierarchical menu settings and multi-layer password input.

> **Housing in precision aluminum alloy:** light, solid and anticorrosion.
Large torque box in high-strength ductile cast iron.

> **Worm gear in quality copper alloy:** high strength, good wear resistance, and long service life.

> **Worm in quality alloy:** steel with high strength.

PRODUCT DESIGN



> Flange connection compliant with the national standards of GB/12222-2005, GB/12223-2005 and JB2920.

> **Surface protection by electrostatic spray:** hard-coat film formed in high temperature with strong resistance to wear, corrosion and salt spray.

> **Lubrication:** maintenance-free and replacement-free.

> **External power:** three-phase (380VAC; -10%/+10%; 50Hz±1%) and single-phase (220VAC; -15%/+10%; 50Hz±1%).

> **Remote control:** inside the electric actuator, unregulated 24 VDC power can be output to drive passive switch input.

> **Motor mode and motor insulation class:** F. Switch type: S2-15min, 60 times per hour. Modulating type: S4-50% modulating duty, 1200 times per hour.

> **Service life:** the switch type undergoes a loop test at the rated torque for 10,000 cycles, and the modulating type undergoes a loop test at 50% of the rated torque for 500,000 cycles.

> **Dust explosion-proof rating:** Ex tb IIIC T135°C Db, compliant with the standards of GB12476.1-2013 and GB12476.5-2013.

> Hard-wired electrical connection for more efficient wiring and maintenance.

PRODUCT DESIGN

PRODUCT DESIGN



- At the center of the control system is an MCU (Microcontroller Unit).
- The HMI (Human Machine Interface) displays the current position, torque and other operational states in real time.
- A color LCD display with wide viewing angle, high brightness and high resolution is adopted to show the operational data in Chinese, English and numbers. The display provides clear and vivid information regarding the actuator' s opening, torque, stroke limit, fault alarms, and other relevant data for control equipment.
- The basic settings, advanced settings, diagnostic information, factory settings and alarm information of the actuator are all presented in both Chinese and English. Thus, users do not need to refer to instructions during use. Meanwhile, the red-green tri-color LED indicator which shows the operational state of the control equipment: fully open, medium or fully closed, also makes it convenient for users on site.
- The red and black knobs below the display window of the actuator are a non-intrusive design and are controlled via magnetic induction. No through shaft penetrates through the control box. With the red and black knobs, parameters of the actuator can be set, adjusted, inquired and controlled.
- The actuator is equipped with an explosion-proof infrared remote control, The infrared remote control can set parameters, debug, query and control the actuator,which is very convenient for users who can operate the device on site without being close to it.

DESIGN FEATURES

DESIGN FEATURES

- **Power phase loss protection:** the actuator has complete functions of power phase loss protection. By monitoring both voltage and current, the device can detect both the power phase loss when the motor is kept still and when the motor is operating. Thus, the motor is forbidden from operating so as to avoid the overheating of motor caused by phase loss operation.
- **Long-start motor protection:** when the CPU gives a command, if the output shaft of the actuator does not move after five seconds, the electric actuator will consider that the valve is stuck, stop powering the motor, and give a fault alarm signal to both local control and remote control.
- **Overheating protection:** two temperature switches are installed at the ends of the motor windings to directly detect their temperature. When the temperature of the motor windings reach that of the temperature switches, the switches will be automatically disconnected, and the control circuit will prevent the actuator from acting.
- **Electrical protection:** both input and output channels are photoelectrically isolated.
- **Power loss data protection:** when the main power experiences power loss, the battery powers the valve position detecting circuit which stores the valve position in a memory.
- **Command conflict:** when there are both an open signal and a closing signal, the CPU will give a command conflict alarm and immediately stop the open and closing actions.
- **Phase sequence self inspection and correction:** The external three-phase power supply can be connected arbitrarily, without the need to compare the corresponding phase sequence connection. The actuator is equipped with a phase sequence self check and correction module. When the external phase sequence is connected incorrectly, the module will issue corresponding instructions to the CPU, which adjusts the switch command to avoid output inversion.

SMART CONTROL

- **Remote control:** switching (internal or external 24V DC, external 220V AC), analog (4-20mA).
- **Local control:** Moment, Hold and Forbid modes.
- **Partial stroke testing:** this function can be activated to test the valve from OPEN or CLOSED position with an action time customized onsite.
- Forbid is a function served for some important valves. It disables remote and local controls until it is turned off.
- **Power loss stroke setting:** when the main power is lost, CPU can be activated by rotating knobs. The valve can be moved to a limit position via a setter or the knobs (OPEN or CLOSED position can only be reached by the handwheel).

Communication function:

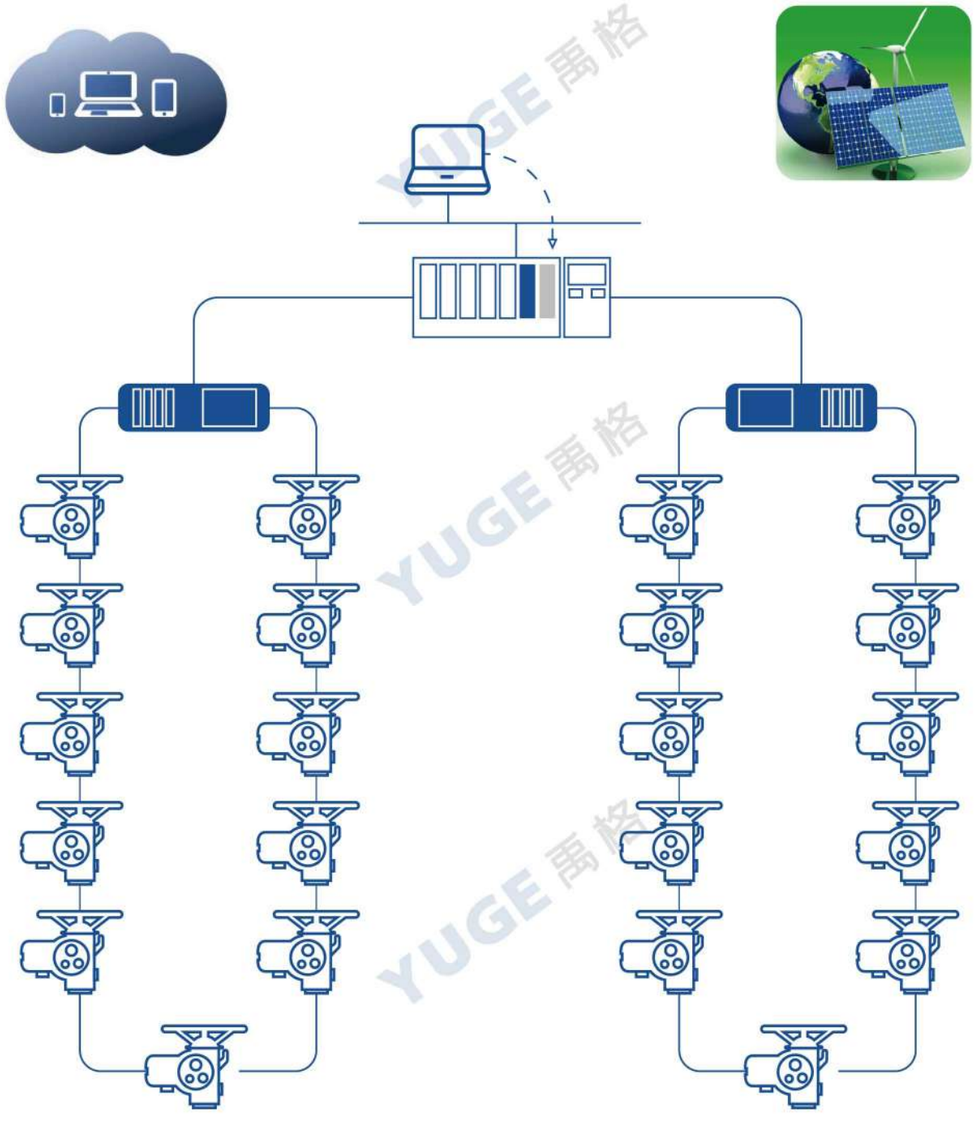
- **4G / 5G communication:** 4G / 5G communication function is accessible, which allows data to be sent to the acquisition center through the cloud platform, and real-time status monitoring of the connected equipment.
- **Bluetooth communication:** The parameters of the actuator can be downloaded or uploaded to a smart phone via a Bluetooth application.



阀控

Bluetooth Assistance Tool

SMART CONTROL



YUGE

SMART CONTROL

> **Field bus control:** Our actuators can be (DCS) remotely controlled by adding the following bus network port cards (MODBUS, PROFIBUS,HART,FOUNDATION).

> **MODBUS:** A fieldbus protocol that is simple yet versatile. It supports RS485 and ring network communication, which are widely used to connect industrial electronic devices.

> **PROFIBUS:** Widely applied to factories, power plants, and automation equipment, and can be configured with FDT2.0 (DTM) and EDD files.

> **HART:** A communication protocol that overlays digital signals on analog signals, allowing easy access to process parameters and diagnostic data from on-site devices at any time.

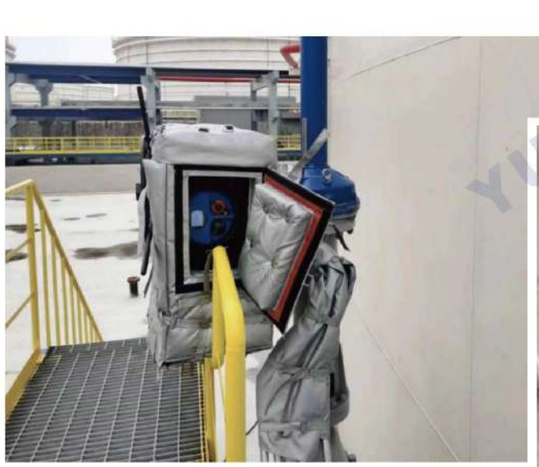
> **Foundation Fieldbus:** A popular protocol for process automation that transfers data at 31.25 kbit/s and works with multiple DCS brands.

SPECIAL ENVIRONMENT APPLICATION

SPECIAL ENVIRONMENT APPLICATION

> Fire Protection

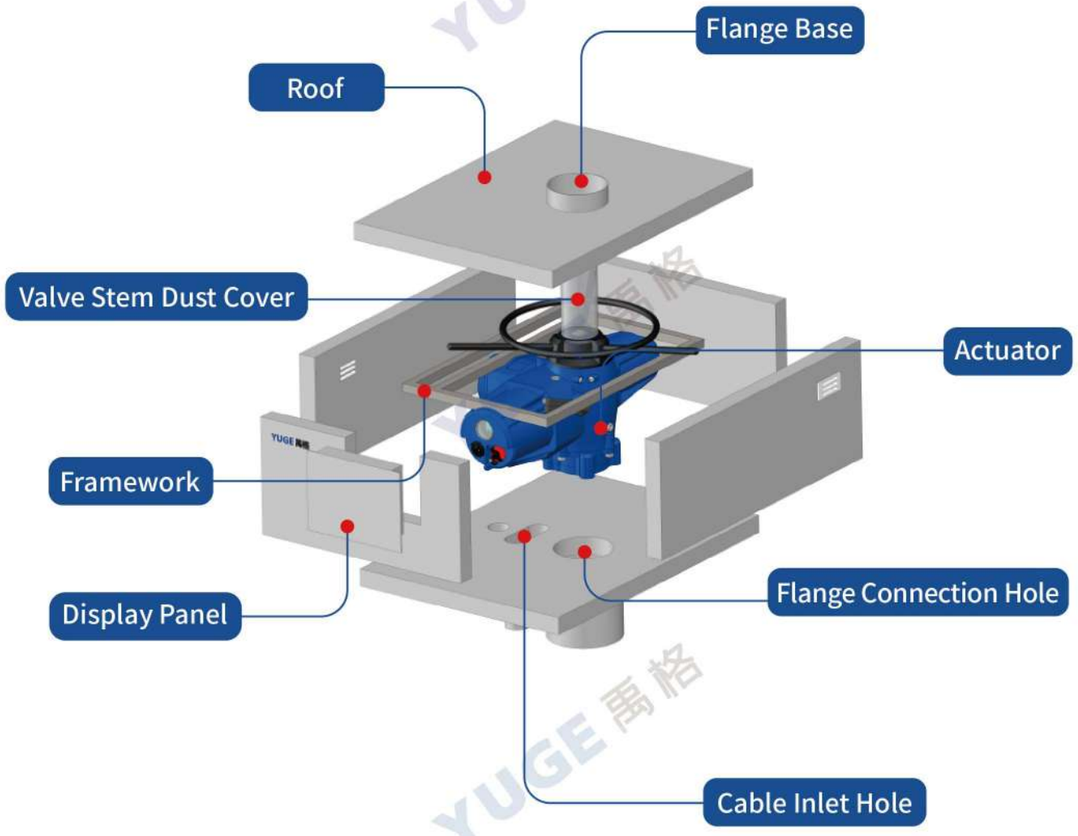
Implementation standard: UL-1709
Applicable temperature environment: hydrocarbon flame 1093℃ -30 minutes
The actuator with the fire prevention system can control the continuous spread of the fire within 30 minutes after the occurrence of the fire, and the operator can close the valve to delay the damage in a controllable way and reduce the risk of the accident.
The product can be installed without support, and the equipment maintenance can be partially disassembled without delay in the production time.
The flameproof enclosure does not contain asbestos and its derivatives and does not harm health.





SPECIAL ENVIRONMENT APPLICATION

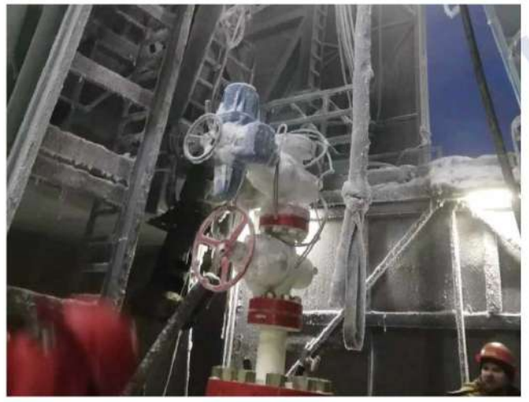
> Fire Cover 3d Diagram



SPECIAL ENVIRONMENT APPLICATION

> Low Temperature Environment

Capable of performing continuous work outdoors in extreme cold of -60°C.





> Ultra-low Temperature Test Report

Have been tested and certified by the third party NTEK for ultra-low temperature performance.



NTEK 北测

TEST REPORT



APPLICATION FIELDS



Power Plant Air Pollution Control

Regional Heating, etc



Steel Mill Aluminum Smelting Plant

Copper Smelting Plant Coal Mines, etc



Waterworks Sewage-treatment Plant

Pump Station Air-conditioning

Fire Protection, etc



Petroleum Gas Field and Pipeline

Chemical Industry



Shipbuilding Industry

Pharmaceutical Industry

Cement Factory, Paper Mill, Food Factory, etc

CASE STUDY











COMPLETE SERVICES

1. We provide free maintenance for products with quality-related issues within one year from the delivery date, in compliance with industry standards.

2.When receiving user consultation or fault repair calls, make complete solutions within 24 hours, send professional after-sales service personnel to deal with them when necessary, and the service is not stopped.

3. The final interpretation of this material is at the sole discretion of Shanghai YUGE Industrial Equipment Co., Ltd.

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