

Quick-acting spring-return actuators for 90° valves fast operation

General

To meet the requirements for the operation of valves in a very short time BIFFI produces two series of quarter turn quick-acting actuators:

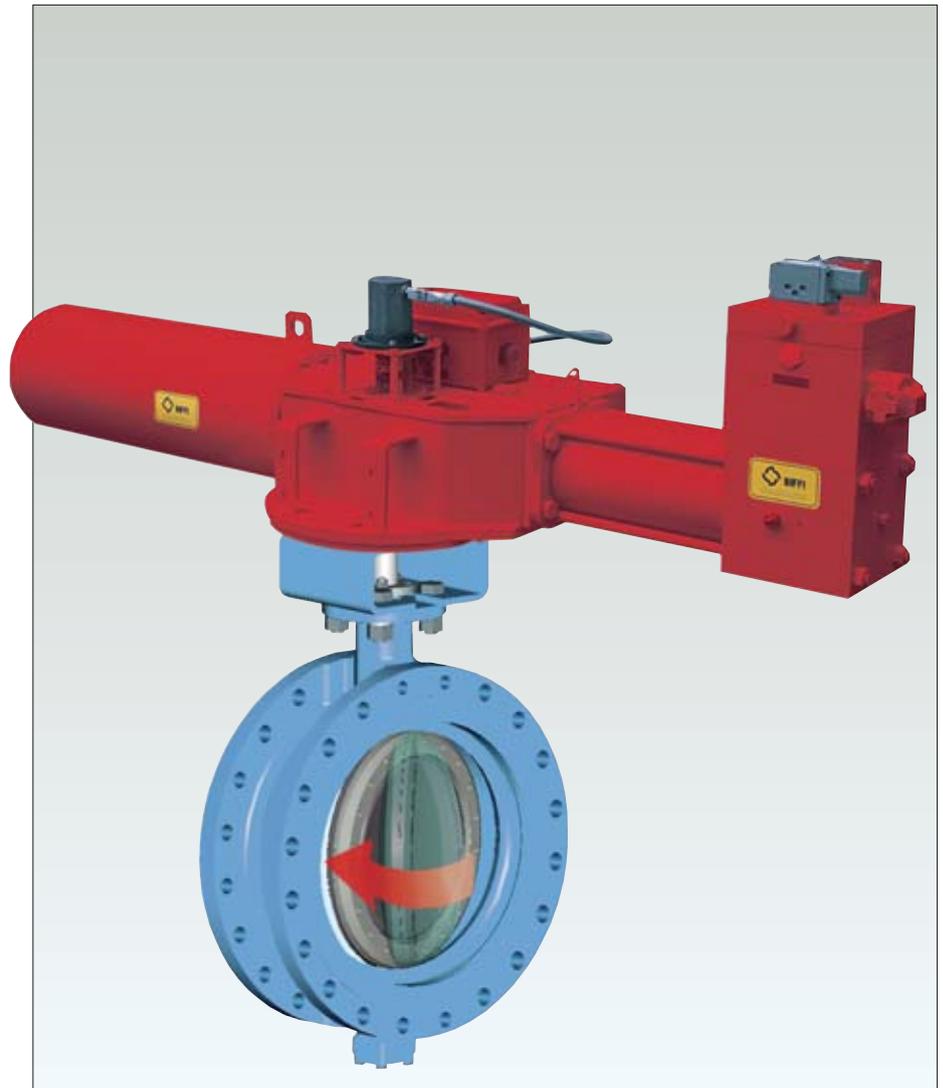
- OLGAS-QA hydraulic actuators
- ALGAS-QA pneumatic actuators

The actuators are spring return type, so to achieve a very short time in emergency operation performed by the spring, independently from the flow capacity of supply lines to the actuator. In fact the quick operation is required normally only to bring the valve to the "safe position". The operating time required by the processes is generally lower than one second, depending on the process characteristics, valve size and operating pressure.

The quick-acting actuator series together with the relevant control systems are specifically designed for this application on the basis of BIFFI long experience and knowledge in design and manufacturing valve actuators and controls systems.

The OLGAS-QA and ALGAS-QA actuators are suitable for any quarter-turn application, mainly for ball and butterfly valve in both On-Off and Modulating heavy duty service. Quick-acting hydraulic and pneumatic actuators for linear valves can be supplied on request.

Electric Fail Safe actuators (EFS series) for emergency and quick-acting operation are also part of the BIFFI production.



Main characteristics

- Quarter-turn mechanism in fabricated steel is the well known BIFFI "Scotch yoke" in the canted or symmetric version to provide the best actuator output torque versus angular stroke curve to overcome the valve required torques. This allows to reduce the actuator displacement and then to allow the valve stroke in a shorter time
- Totally enclosed, weatherproof housing
- Bronze yoke bushings and sliding blocks, sintered bronze charged with teflon bushings for guide bar and piston rod to provide minimal friction and extended service life
- Hard chromium plated and polished guide bar and piston rod for corrosion resistance and minimal friction
- Electroless nickel plated and polished cylinder for corrosion resistance and minimal friction
- Coiled spring construction for the fail-safe action to increase repeatability and efficiency
- Completely enclosed spring module for total safety
- Calculation of mechanism, cylinders, spring modules certified by Lloyd Register

OLGAS-QA & ALGAS-QA

Quick-acting Actuators

Features and benefits

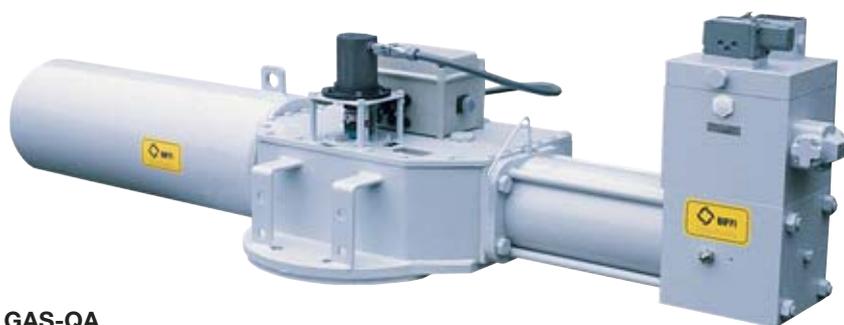
“OLGAS-QA” and “ALGAS-QA” are the evolution of the standard Olgas and Algas series specially designed to meet the technological requests of the advanced power plants with steam and gas turbines and compressors of the new generation with high operation flexibility and high dynamic response involving:

- use of actuated valves with very short operating time (<1 sec) especially during emergency conditions or process transients
- special damping system to gradually reduce the speed in the last portion of the valve stroke, avoiding possible impact damages to the valve trim and to the actuator itself
- combined functions On-Off and Modulating service where required
- actuator for both Modulating service and for quick acting safety operation available: one only valve at the place of two separate valves (one “control” valve + one “stop” valve) with a significant saving for the customer
- use of components with a high level of reliability
- accurate selection of control panel valves (flow capacity, material, protection degree of electrical parts) so to optimise actuator performances and provide high reliability for severe applications with vibrations, high temperature, aggressive ambient conditions

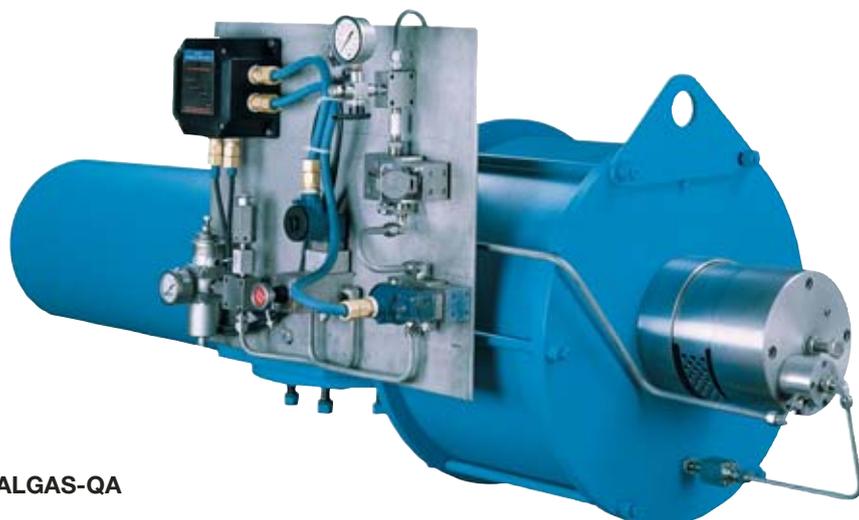
- limit switches, position transducers, solenoid valves, servovalves or proportional control valves selected according to the severest specifications and BIFFI experience
- possibility to provide redundancy for critical control components like dump valve and solenoid valve, to increase the reliability of the system
- use of direct coupling to the valve stem, without adaptation bushing, avoiding dangerous clearances
- 100% individual test on Biffi bench with recording of the speed (angular stroke vs. time). The tests are carried out with actuator mounted on the valve, if required
- possibility of partial stroke operation for field testing purpose
- availability of the BIFFI “IPOS” or “RBS” position controllers to close the regulating loop for continuous or step-by-step action
- heavy duty construction for modulating service with “Fiberglyde” sliding parts
- special coating for off-shore or corrosive environments
- in very critical applications involving large and expensive equipment the total reliability of the actuator is the first requirement: the strict Quality Assurance procedures and the ISO 9001 system granted by BIFFI experience make the difference.

Typical applications

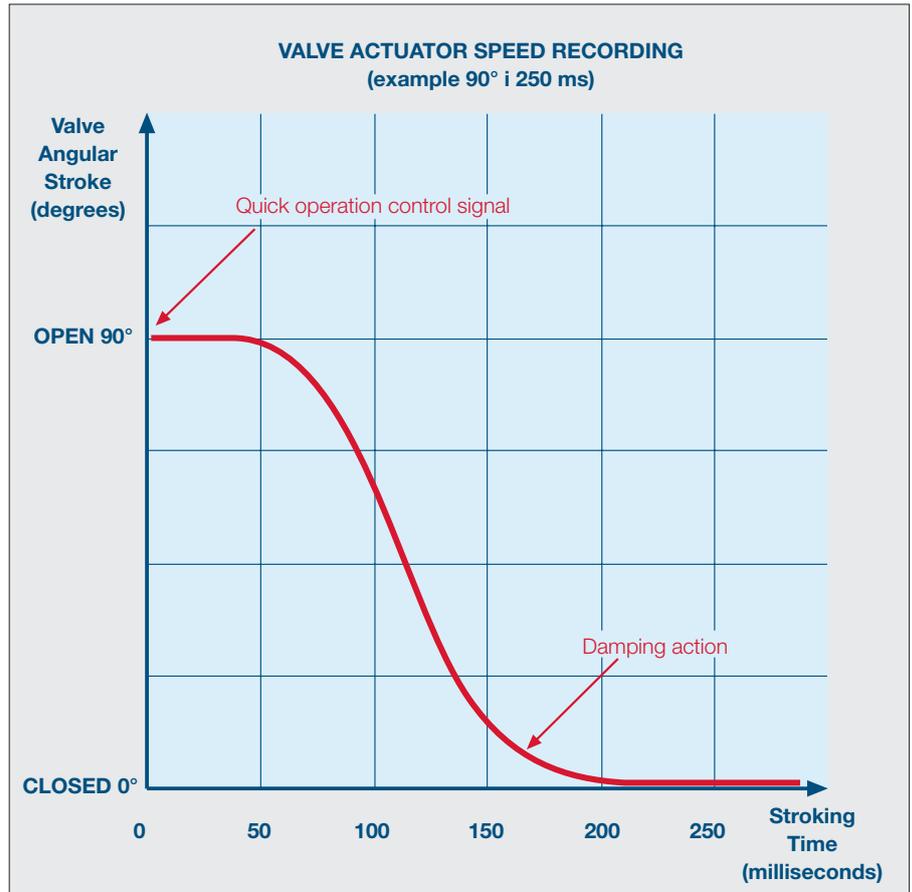
- Conventional and geo-thermal power plants, Advanced Combined Cycle plants applications
- Steam turbine HP-LP feeding valves (trip and control)
- Gas turbine feeding valves (trip and control)
- Turbine by-pass valves
- Compressor blow-off valves
- Condensator water feeding valves
- Boiler combustion control valves
- Turbine and rocket engines test facilities
- High pressure relief valves



OLGAS-QA



ALGAS-QA



Special features for the “OLGAS-QA” hydraulic actuators

- Special 2 way / 2 positions high flow capacity dump valves
- Emergency operation controlled by an electric signal to the relevant solenoid valve or by depressurising the main oil supply line or an oil pilot line
- Manifold design of cylinder end flange for compact assembling of dump valves, solenoid valves, servovalves or proportional valves, minimising the use of piping connections, reducing the risk of oil leakage also in case of strong vibrations, highly increasing the total reliability of the system and allowing easier assembly and disassembly of components
- Return oil recovery into the cylinder head flange chamber during the emergency quick operation with the following benefits:
 - no oversizing of the oil return piping to the hydraulic power pack, with significant saving for the customer
 - repeatability of the relevant stroking time which is independent from the pressure in the oil return piping under any working condition of the plant
- Cylinder double tube design to connect the cylinder end flange manifold (where the dump valve is assembled) to the cylinder head chamber by an annular duct to provide a large flow area: pressure drops are minimised, allowing shorter stroking times; performances and reliability are increased compared to a connection by external piping and threaded fittings
- Electroless nickel plated cylinder, tubes, flanges and piston to allow the use of any kind of hydraulic fluid (mineral oil, oil for turbine lubrication, phosphoric ester and other fire-resistant fluids)
- Cylinder seals in Viton or other material suitable for the fluid working conditions and to meet customer specifications
- Oil supply and return line flange connections available
- Special flanged “guarded” oil connections available
- Special oil shield available for various configurations
- Solenoid valves poppet type no-leakage, low power consumption available
- Standard components bodies in carbon steel or cast iron. Stainless steel versions can be supplied
- Controlled oil cleanliness, where required
- Possibility to combine On-Off fast acting and Modulating operation by means of servovalves or proportional control valves

OLGAS-QA & ALGAS-QA

Quick-acting Actuators

Special features of the "ALGAS-QA" pneumatic actuators

- BIFFI design large capacity quick exhaust valve integrally built into the end flange of the cylinder
- Special damping system to gradually reduce the speed in the last portion of the valve stroke, avoiding possible impact damages to the valve trim and to the actuator itself
- Use of direct acting solenoid valves to control the actuator fast acting operation
- Possibility to combine On-Off fast acting and modulating operation by means of pneumatic or electro-pneumatic positioner with air booster, where required

Technical data

- Seven actuator sizes from model 0.3 to 18. Larger sizes available on request
- Torque range: from 400 Nm to 80000 Nm. Higher values available on request
- Motorised valves: butterfly, ball, special
- **Operating time:**
 - 0.2 sec to 1 sec (for OLGAS-QA)
 - 0.3 sec to 2 sec (for ALGAS-QA) depending on:
 - valve size, type and torques
 - supply pressure
 - inertia of the valve and actuator mobile parts
- **Power supply:**
 - OLGAS-H-QA: high pressure oil at 80 to 250 bar g (from power packs)
 - OLGAS-QA: low pressure oil at 5 to 30 bar g (from turbine lubrication system)
 - ALGAS-QA: instrument air or natural gas at 3 to 10 bar g
- On-Off service, spring to close or spring to open
- Combined version On-Off + Modulating service on request
- For hydraulic actuators, separate or on-board power packs for electro-hydraulic or pneumo-hydraulic oil supply
- Electric components enclosures can have explosionproof and/or weatherproof protection



Note

For large valves with significant moment of inertia and very short operating time the suggested solution is the hydraulic actuator, possibly with high pressure supply.

