Electro-mechanical Actuator with Hydrostatic Drive
For Actuation and Control Functions in Valve Armatures

Technical Information

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Everything under Control – with the electro-mechanical Actuator for Control Functions

**Introduction**
The electro-mechanical actuator with a hydrostatic drive system is designed to complete the range of the existing hydraulic actuators for the control, stop and trip functions in valves. The actuator is suitable for mounting on valves, which are used for the control of liquids, gases and steam with SIL3 safety level.

**System Structure**
The electro-mechanical actuator consists of a hydrostatic linear drive and a superimposed spring-supported trip function.

**Features**
- Electrical interface for power and signal transmission
- Positioning by closed-loop controlled synchronous motor and hydrostatic drive
- Superimposed trip function by spring supported closing function
- Limiting the maximum trip speed
- Integrated damping function
- SIL3-capable version

**Advantages**
- No external power unit
- No installation of hydraulic pipes
- Clear and concise control
- Easy parameterization with provided software
- Low maintenance efforts
- Use of proven components
- Robust construction
- Short length
- Suitable for large forces and strokes
- Insensitive to vibration
- Simple sealing concept
- Energy-efficient solution
- Reduced fire hazard

**Applications**
- Valve-actuating devices in gas and steam turbines
- Butterfly valves with fail-safe position
- Retrofit projects
- Stand-alone applications
- Valves with fast opening function

**Application Example**
The steam supply to a turbine must be controlled and stopped in case of accident. This function takes an electro-mechanical actuator with a hydrostatic drive, which is mounted on the valve.
Schematic Diagram and Function

The trip end position of the actuator is also defined as the zero position of the actuator. In this situation, the right closing piston is positioned with the spring force in the right end position, which also means that the valve is closed.

The tensioning of the spring is effected by pressurizing the control piston, which moves to the right and increases the preload of the built-in valve-closing spring.

By pressurizing the ring chamber of the divided closing piston, a hydraulic coupling is achieved with the control piston.

In the closed-loop control position the divided closing piston is moved by position control in combination with the control piston and the tensioned spring to dose the media supply (liquid, gas, steam) in a plant.

The trip function (see above) is achieved through the interruption of the switch signals, so that primary, the pressure is released in the piston ring chamber of the right closing piston, and thus, the valve closing function is triggered by the spring.
Approved System Components

The actuator contains a control and a divided closing piston. The power generated by the hydraulic pump is supplied to the position control loop depending on the demands of the sequence program.

The hydraulic pump – driven by the synchronous servo motor – acts as a hydro-mechanical energy converter, i.e. the mechanical power released by the servo motor is converted into an equivalent hydraulic performance.

The synchronous servo motor represents the electro-mechanical part of the hydrostatic drive. It is characterized by high dynamics at specified rotation speed set value changes, and is part of the actuator position control loop.

The drive control unit consists of a control and a power unit. It includes all the logical connections, which are necessary for the proper operation of the actuator in its various modes of operation, and supplies the electric power demand for driving the servo motor.