Compact SuperCap actuators with controlled electrical emergency control function.

Increased safety, lower costs.
SuperCaps (Supercapacitors) are electrochemical capacitors that are lighter in weight and faster in response than conventional batteries. This modern energy storage technology is now enhancing energy efficiency and the functionality of complex safety solutions around the globe. Belimo has intensively tested and pursued further development of the SuperCap technology in order to equip its own linear, rotary and globe valve actuators for solutions with an innovative electrical emergency control function.

SuperCaps: Tested and further developed by Belimo.

SuperCaps absorb energy very quickly and discharge it immediately as required. Furthermore, they have a longer service life and are more cycle-resistant than accumulators. Many high-tech applications have already been optimised by these properties:

- Systems for energy recovery – e.g. the KERS (Kinetic Energy Recovery System) used in Formula 1
- Systems for voltage bypass of catenary-free distances – e.g. with trams and trolley buses
- Systems for emergency triggering of safety equipment (see info box on the right)

Belimo has been testing the SuperCap actuators that it has developed under the harshest of conditions since 2007. It is primarily the availability of the safety function in the presence of continuous loads and extreme temperatures of +50°C or -30°C and long-term simulations of the charging and discharging of the capacitors that are part of this programme. In order to combine this technology with its own emergency control actuators, Belimo has furthermore developed and patented a SuperCap management with a microprocessor controller. It is thus possible to:

- safely charge and discharge the super capacitors,
- have high operating safety and a long service life of at least 15 years (> 100,000 full charges).

**SuperCap management from Belimo: For maximum availability**

**In use wherever safety and energy efficiency are required**

### Renewable energies

- Wind turbines: Control of blade position and triggering of emergency shutdown
- Photovoltaics systems: Voltage stabilization

### Medical electronics

- Life-saving: Energy storage in defibrillators

### Aviation

- Evacuation: Emergency opening of the doors and triggering of the emergency slides

### Traffic

- Vehicles: Triggering of airbags
In the case of an electrical supply interruption, exposed dampers and valves are automatically closed by rotary or linear actuators with emergency control function. This safety function protects systems against damage from frost and splash water or prevents damaging gases from entering ventilation circuits. SuperCap actuators from Belimo are further distinguished by innovative, intelligent efficiency advantages.

**High and constant performance with low energy consumption**

Thanks to the comprehensive testing and development efforts, SuperCap emergency control actuators from Belimo now offer outstanding performance in safety-relevant HVAC equipment:

- **Strong torques with relatively low weight**
- **Constant torques and actuating forces across the entire setting range – even in the safety end position**
- **Massive increase of the torque in piggyback (= coupling of several actuators)**
- **Up to 80% less energy consumption, as the high energy expenditure for the permanent holding of the final controlling element in its initial position is dispensed with. The electricity consumption is lowered in stand-by mode**

**«Controlled Power Off»: More comfort and lower costs**

A further innovative function is the possibility of being able to set the triggering of the emergency setting position individually from 0 to 10 seconds between power failure and closing command. This unique «Controlled Power Off» function holds a true savings potential in the event of emergency:

- **Short voltage failures can be bypassed without an interruption in the operation of the system and thus without any loss of comfort in the building**
- **Time expenditure and costs for returning to operation are dispensed with in many cases**
- **Sensitive devices and systems remain protected during brief electricity interruptions**

**Advantages of the SuperCap actuators with emergency control function**

**Freely selectable emergency setting position and change of running direction**

- Adjustable POP emergency setting position (Power Off Position) for a scale of 0…100% on the actuator
- With switch for changing the running direction

**Exactly suitable functionality, uniform operating philosophy**

- Open-close, 3-point control types
- MF and communicative MP types with individually adjustable parameters
- Simple integration in the systems concept with complete compatibility with all damper and valve actuators from Belimo

**Simple, space-saving installation**

- Simplified installation thanks to compact external dimensions and low weight
- Separately available SuperCap modules for connecting 2 CM rotary actuators each enable space-saving solutions with very limited installation conditions
Multifunctional actuators for the safety of HVAC applications.

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<th>Typical fields of application</th>
<th>Safety function</th>
<th>SuperCap actuator types</th>
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| Ventilation plant rooms       | Protection against frost through cold outdoor air in the event of power failure:  
• Outside air dampers up to 8 m²  
• Outside air dampers up to 8 m² in ventilation plant rooms in the outdoors area (with degree of protection IP66/NEMA4 for external installation) |  
• Rotary actuators up to 40 Nm  
• IP66/NEMA4 actuators up to 40 Nm |
| Exhaust hoods                 | Personnel and system protection in the event of the sudden escape of hazardous gases in chemical-industrial laboratories:  
• Closing time for actuator 4 s  
• Closing time for emergency control function 4 s |  
• Very fast running actuators 6 Nm |
| Wood combustion systems       | Protection against backburning:  
• Backburning dampers up to 3 m²  
• Linear damper position with stroke lengths up to 100 mm  
• Opening and closing the ash grates |  
• Linear actuators 150 N and 450 N |
| District heating substation   | Securing a limited service water temperature in the event of power failure:  
• Flow rate 16 m³/h  
• Short valve setting times for optimum comfort |  
• Globe valve actuator 1,000 N |

We set standards. www.belimo.eu

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