

**CESIM – Fail-Safe Actuators  
Protecting Assets and  
Equipment.**

**Uncompromised Safety.  
Small Devices.  
Big Impact.**



# Safety

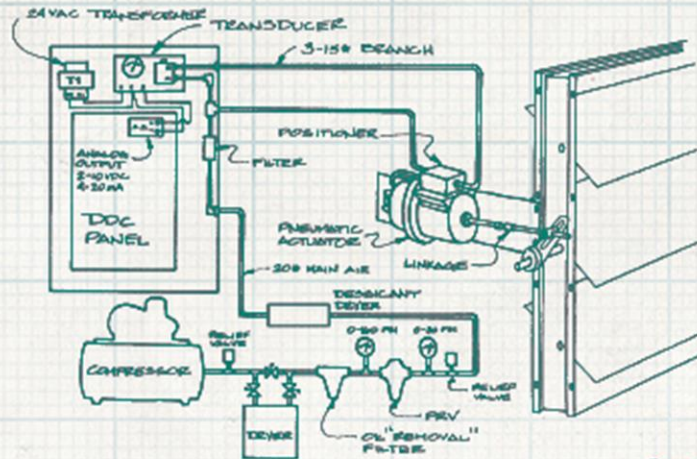


**Safe. Strong. Fast. Reliable.**

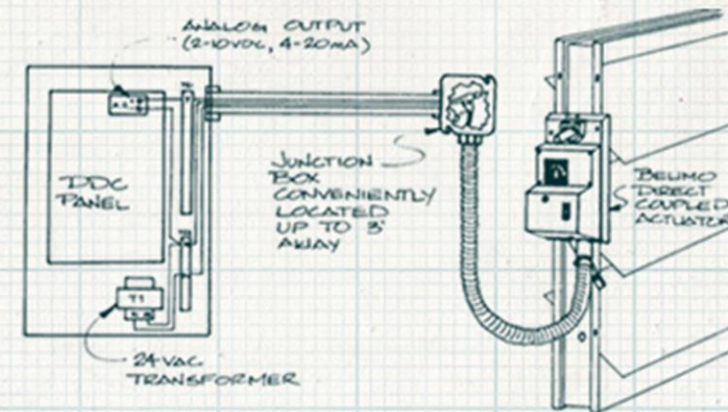


# The founding idea

## Damper Actuator with linkage

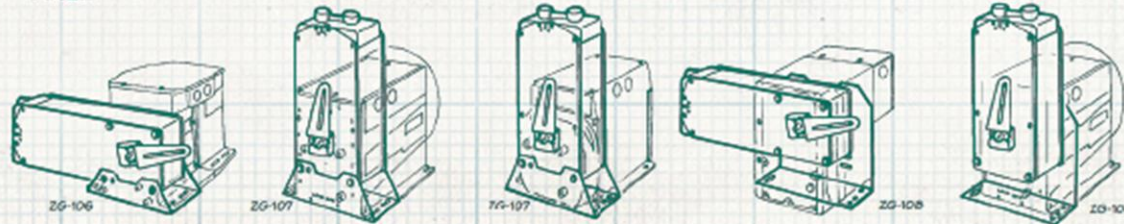


## Direct mount Belimo Damper Actuator

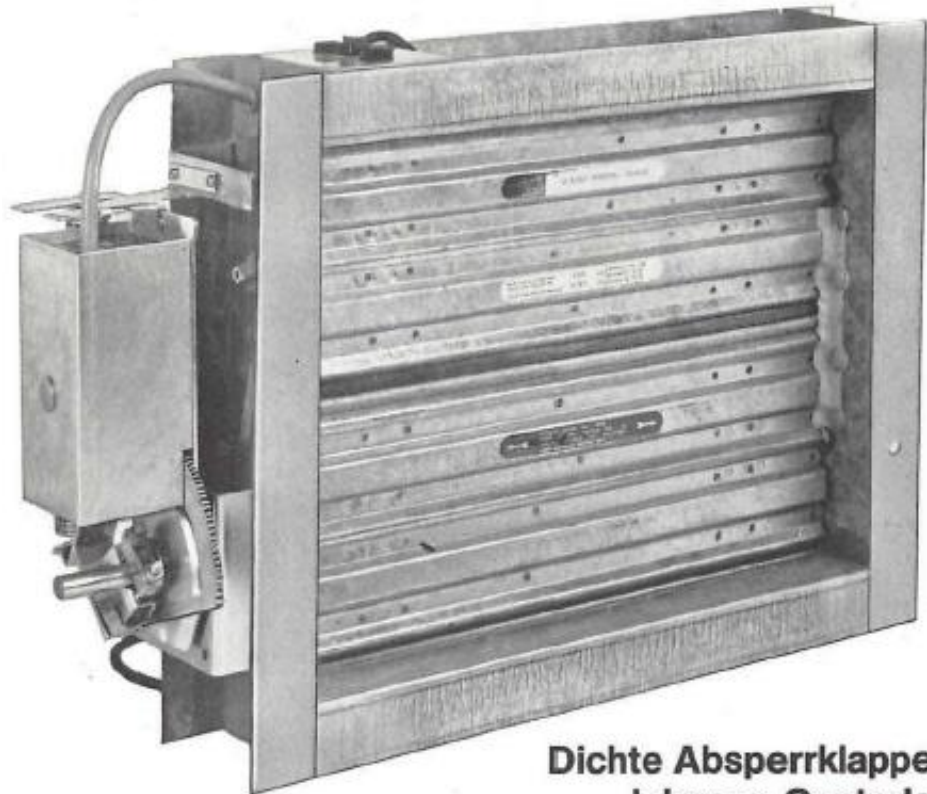


FUTURE

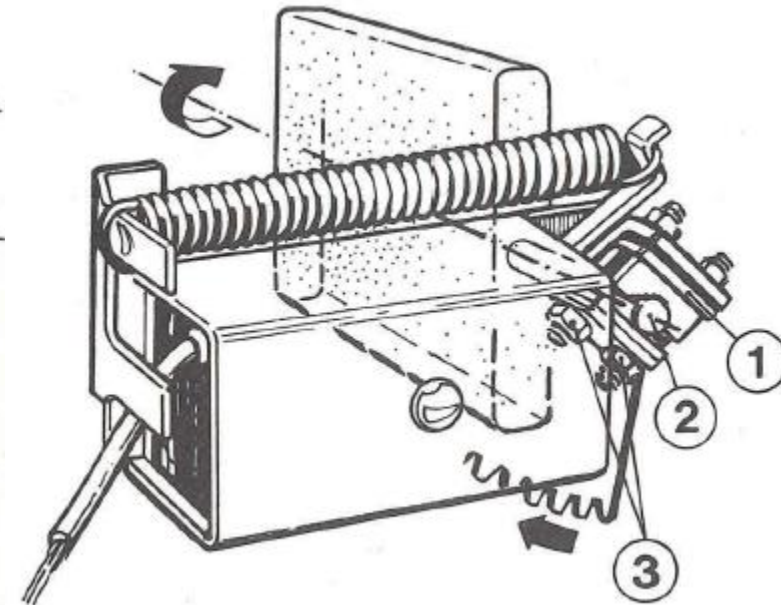
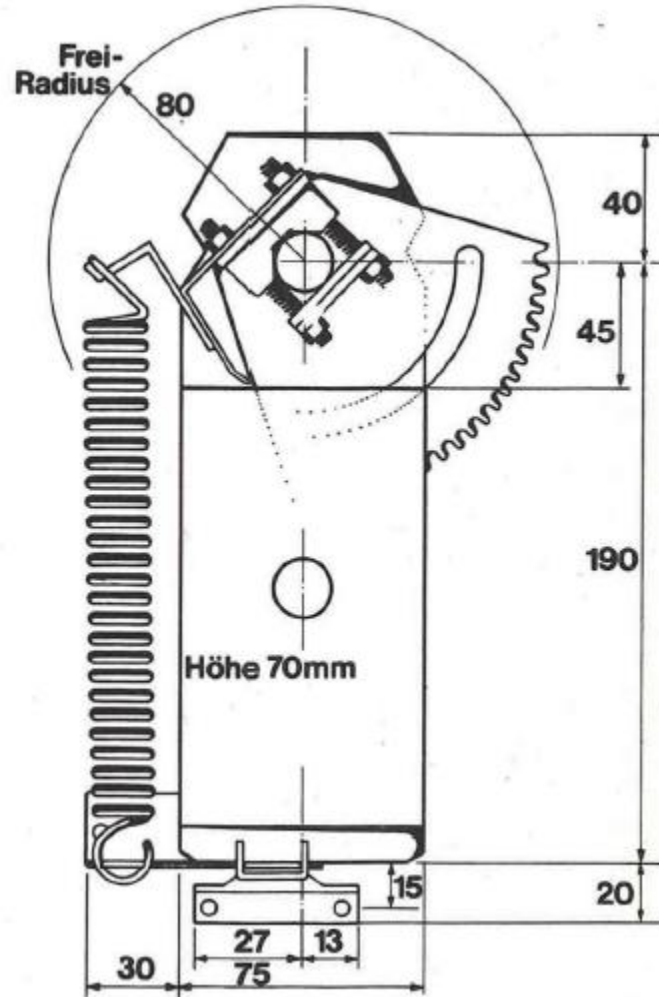
PAST



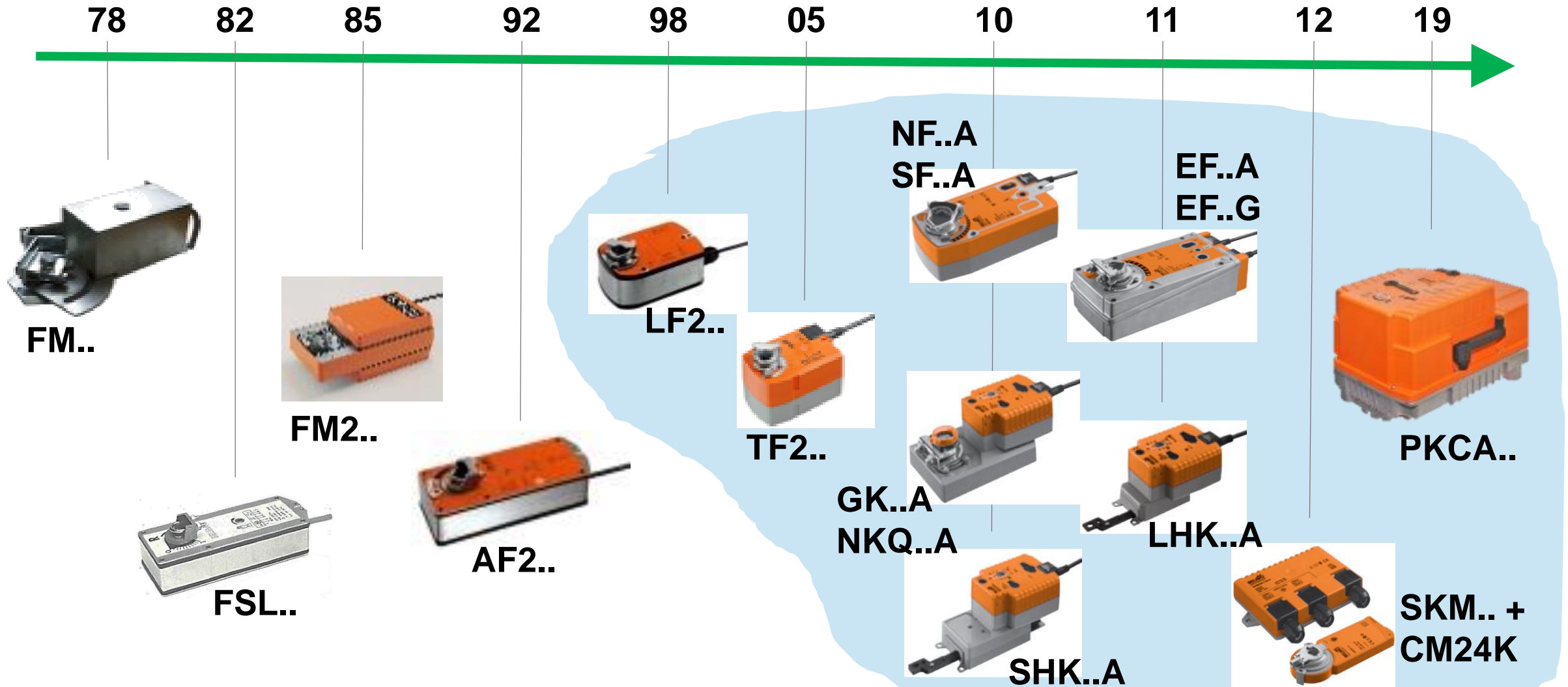
# With what it all started



Dichte Absperrklappe  
Johnson Controls  
mit BELIMO-Federrücklaufmotor



# History of Fail-Safe Actuators





## Guaranteed Actuator Design Life

For over 35 years Belimo has been the worldwide leader in HVAC actuation. Belimo verifies the design endurance of all actuators with high-tech test equipment. Belimo designs this test equipment for the specific purpose of performing both life cycle and partial cycle testing.

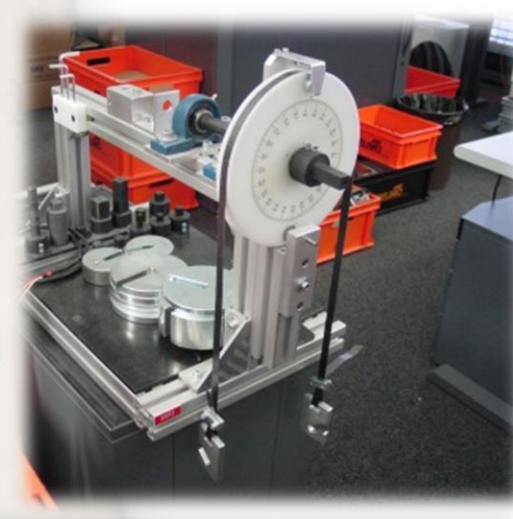
Belimo provides the design life and partial cycle data as guidelines to estimate useful product life. The actual life of a Belimo actuator depends on the installed application.

## Design Life FULL Cycle Testing

Prior to launching a new product series Belimo tests several batches of actuators (e.g. AFB/X, LF, LMB) to benchmark the actual performance to the design target in order to estimate the installed life expectancy. The actuator sampling is taken from the 0-series or pilot production which utilizes production tooling from all vendors and Belimo. During the actuator series life-cycle Belimo also randomly samples 5 to 10 actuators at random intervals to verify reliability from production lots.

The life cycle test results are intended to provide an approximate actuator life expectancy. Belimo guarantees the actuator life only when the actuator is installed and used according to the product specification.

- *Guaranteed Actuator Design Life Cycles – Spring Return:* Belimo guarantees that all actuators will operate for 60,000 full cycles when the labeled torque load is applied. For example, an AFBUP is rated for 180 in-lb.
- *Guaranteed Actuator Design Life Cycles – Electronic Failsafe:* Belimo guarantees that all actuators will operate for 100,000 full cycles when the labeled torque load is applied (motor 95° rotation) over the specified torque and voltage range. (Does not include 'Q' types)



# Fail-Safe Applications: SuperCaps are used where?



**Renewable energies**  
Wind turbines: Control of blade position and triggering of emergency shutdown



**Medical electronics**  
Life-saving: Energy storage in defibrillators



**Aviation**  
Evacuation: Emergency opening of the doors and triggering of the emergency slides



**Automotive**  
Kinetic Energy Recovery



**Traffic**  
Vehicles: Triggering of airbags

# Fail-Safe paradigm





# Belimo Fail-Safe! Safety systems you can trust!



- A complete range of Fail-safe Actuators ensures the protection of lives, assets, and reputations.



The logo for Belimo, featuring the word "BELIMO" in a bold, black, sans-serif font. Above the letters "L" and "I" are two parallel orange diagonal bars. A registered trademark symbol (®) is located to the upper right of the letter "O". A solid orange horizontal line is positioned directly below the text.

**BELIMO**®