



## ELECTRIC ACTUATORS

for continuous underwater use



The SA multi-turn actuator for continuous underwater use by AUMA opens new applications for electric actuators – for water supply, in hydropower plants and underwater valves in general.

Easy installation, low operating costs and maintenance requirements as well as the comprehensive functions of the integral actuator controls – to name only some advantages of electric actuators, turning them into a true solution for underwater applications.

## TIGHTLY SEALED

A sophisticated sealing system combined with excellent corrosion protection properties qualify AUMA actuators for underwater use. Double sealed cable glands at the electrical connection safely prevent any ingress of water. Inner seals at all housing covers, sometimes coming in pairs, as well as a solid shaft made of stainless steel complete the universal concept.

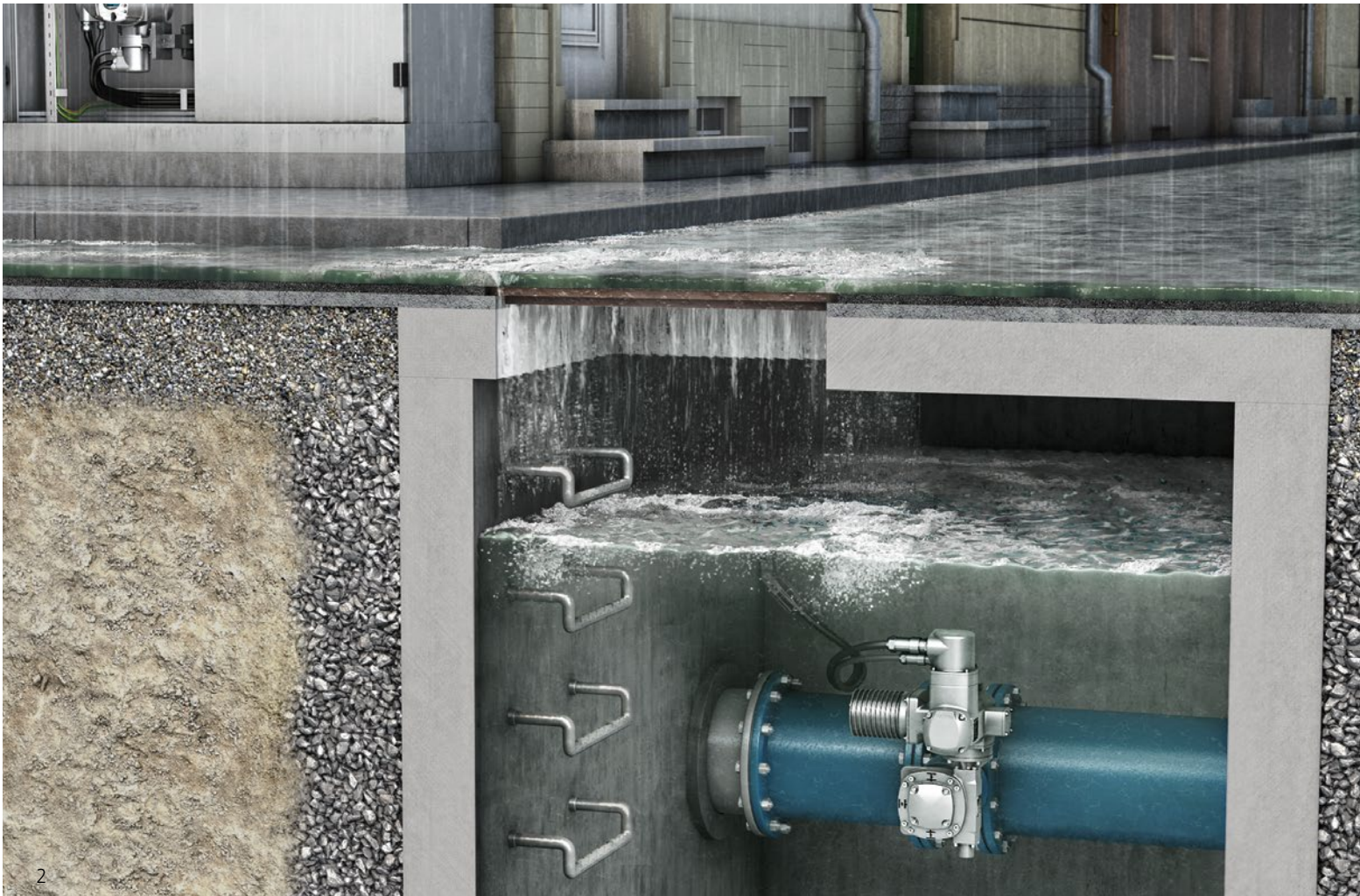
## EASY TO INSTALL

Electric actuators just require power supply and a signal cable: They are easy to install and cost-efficient in operation. Thanks to the modular AUMA product portfolio, actuator controls are installed separately outside the flooded area.

## MAINTENANCE-FREE AND ENVIRONMENTALLY FRIENDLY

Another asset: AUMA actuators are virtually maintenance-free. They will reliably operate under water for many years. Only after a few years of installation, AUMA recommends an inspection. Furthermore, electric actuators do not present any risk of water contamination by leaking oil. Consequently, they are an environmentally friendly alternative to hydraulic actuation technology.

## SA MULTI-TURN ACTUATORS FOR CONTINUOUS UNDERWATER USE



### Hydropower applications

Electric actuators for underwater used are the perfect choice for hydropower applications. They operate gate valves, butterfly valves and globe valves, for example, used in turbine control, spear head adjustment or guide vane adjustment.

In in run-of-the-river power plants (ROR), used to exploit the energetic potential of water courses with low gradient levels, variable speed electric actuators are deployed for starting, synchronisation and stopping of turbines installed completely under water.

In screen cleaning systems, retaining twigs and other solid foreign objects from the turbine inlet, electric actuators for underwater use are installed for ecological and economic reasons. The variable speed version enables soft and gentle approaching of end positions.

### Applications in water management

Where both supply and sewer pipes are underground, actuator and valve are often installed in pits below ground level. If high waters are a permanent risk, actuators for underwater use will operate reliably even if flooding persists. Therefore, they are ideal for installation in monsoon areas.

An explosion-proof version is available for sewage treatment plants, sewage channels or sewage pits, where fermentation gases like methane generate a risk for potentially explosive atmospheres.

### Civil engineering constructions for water applications and special applications

The actuators are ideally suited for special operation requirements of underwater valves, for offshore installations, for flood protection at coastlines and rivers or within civil engineering constructions for water applications.



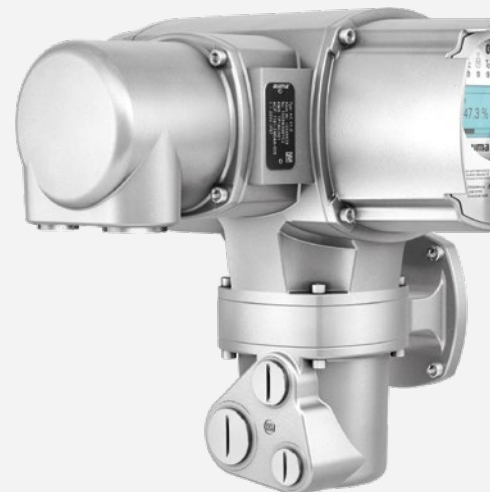
## Electric SA multi-turn actuator

AUMA SA multi-turn actuators are available in many sizes and versions and can be tailored to the individual requirements of the application. They are characterised by easy operation, robust design, reliability and a long service life. These properties are indispensable for continuous underwater use.

In addition, actuators for continuous underwater use are subject to a comprehensive sealing scheme, preventing the ingress of water efficiently for several years.

A handwheel is available as option for sizes 07.2 – 16.2.

AC



### 1 MWG electronic control unit for non-intrusive setting

The electronic control unit (MWG) is required for underwater applications. All actuator settings, including end position setting for travel and torque are made non-intrusively, i.e. without opening the housing.

### 2 Solid shaft

As integral part of the sealing system, a solid shaft made of stainless steel instead of a hollow shaft is used to transmit the torque to the valve.

### 3 Valve attachment

Output drive types B, D, B3D and DD can be used for valve attachment. B1 and B2 are directly integrated as bore with keyway into the solid shaft; B3, B4 and D require an additional output drive sleeve. B3D and DD are designed as special shafts.

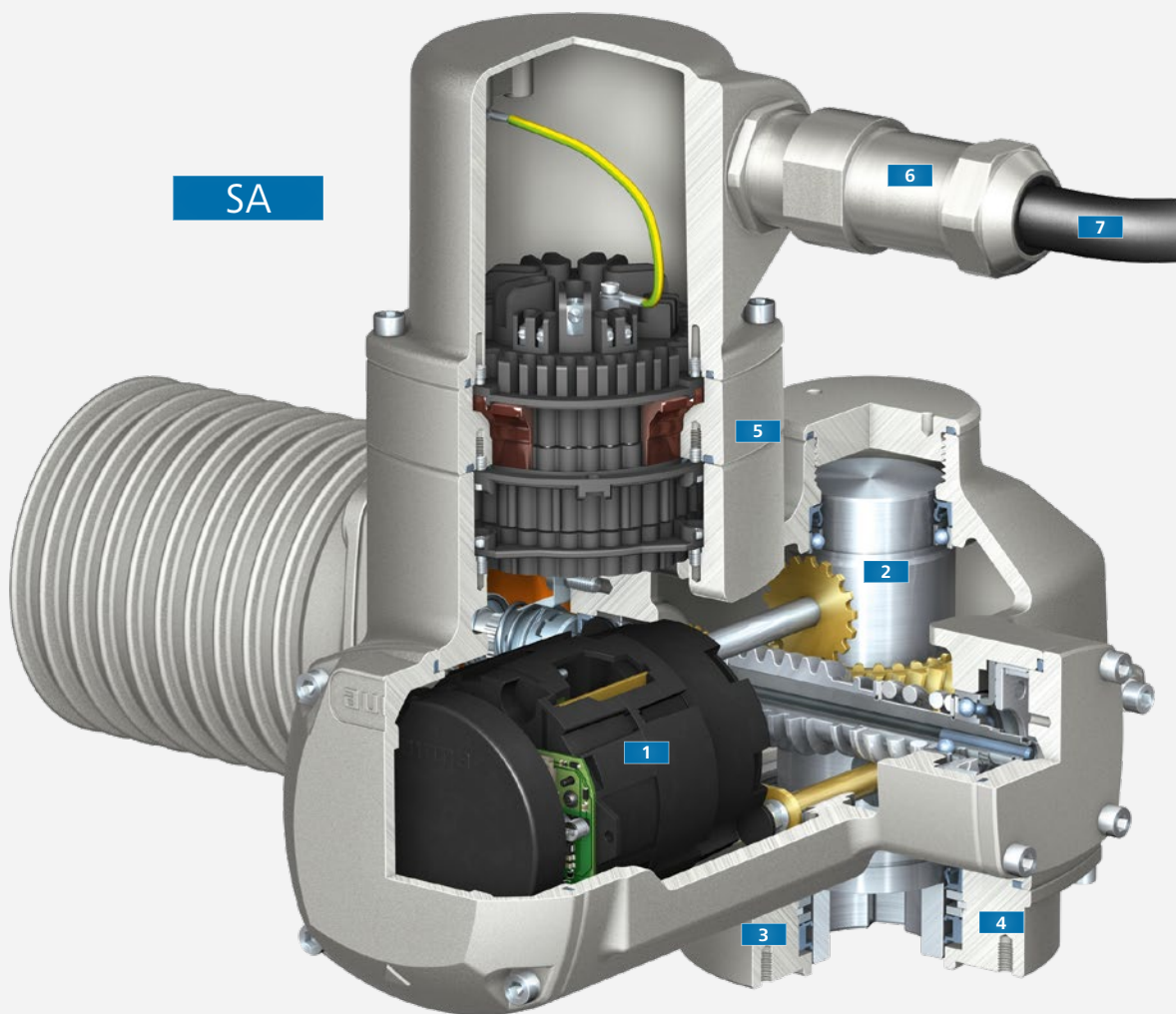
### 4 Double sealed bearing flange

Additional inner seals avoid ingress of water into the actuator.

### 5 Double sealed frame

The proven AUMA double sealed frame tightly seals the electrical connection towards the actuator.

SA



### 6 Special cable glands

Double sealed cable glands also provide safety at the electrical connection.

### 7 Special wiring

A special cable set is used for linking actuator and actuator controls, which is perfectly suited for continuous underwater use and UV resistant.

## AC integral actuators controls

AC actuator controls are mounted separately outside the water while cables connect them to the actuator. The state-of-the-art actuator controls assume communication control between DCS and actuator. Actuator controls are available with various interfaces to the DCS – allowing both parallel signal transmission and fieldbus communication. Supported are among others Profibus DP and Profinet, Modbus RTU and TCP/IP, Foundation Fieldbus as well as HART and WirelessHART.

Integral local controls also allow for direct actuator operation. Advanced diagnostic functions enable preventive maintenance and integration of actuators into asset management systems.

## SAV variable speed actuator (option)

SAV variable speed actuators with ACV integral actuator controls are also available as version for underwater use. Operating speed can be adapted across the travel for these actuators. Soft start and gentle approaching of end positions as well as modulating duty with utmost positioning accuracy and fast emergency operations are therefore also possible.



## Combination with AUMA gearboxes (option)

AUMA gearboxes are also approved for continuous underwater use. Should a part-turn actuator be required for operation of a ball valve or butterfly valve, the SA multi-turn actuator can be combined with a GS part-turn gearbox.



## ENCLOSURE PROTECTION

AUMA actuators for continuous underwater use fulfil the requirements of improved enclosure protection IP68-C15. The maximum permissible head of water is 15 m. As an option, heads of water up to 60 m as IP68-C60 are possible. In explosion-proof version, the actuators are supplied in IP68-C8 enclosure protection for heads of water up to 8 m.

## CORROSION PROTECTION

AUMA's TÜV certified corrosion protection scheme with two-layer powder coating is complemented by an additional coat of wet paint as well as screws, name plates and outside shafts made of stainless steel. The devices are suitable for the following ambient conditions in accordance with EN ISO 12944-2:

- > C5-M (very high, marine, coastal and offshore areas with high salinity, almost permanent condensation and with high pollution)
- > Im1 (fresh water)
- > Im2 (sea or brackish water)
- > Im3 (soil)

## EXPLOSION PROTECTION

Actuators in explosion-proof version offer the following explosion protection according to ATEX 2014/34/EU:

- > II2G Ex de IIC T4 or T3 Gb
- > II2G c IIC T4 or T3
- > II2D Ex tb IIIC T130 °C or T190 °C Db IP6x

## TECHNICAL DATA

The following technical data is for reference only. For detailed data, please refer to the separate technical data sheets.

Multi-turn actuator type	SA 07.2-UW – SA 16.2-UW	SAR 07.2-UW – SAR 16.2-UW
	SAEx 07.2-UW – SAEx 16.2-UW	SAREx 07.2-UW – SAREx 16.2-UW
	SAV 07.2-UW – SAV 16.2-UW	SARV 07.2-UW – SARV 16.2-UW
	SA 25.1-UW – SA 30.1-UW	SAR 25.1-UW – SAR 30.1-UW
Torque	10 Nm – 1,000 Nm	
Output speed	4 rpm – 180 rpm at 50 Hz	
Valve attachment	F07 – F16	
Mains voltage for 3-phase AC	50 Hz: 230 V, 380 V, 400 V, 415 V, 500 V 60 Hz: 220 V, 380 V, 400 V, 440 V, 460 V, 480 V Permissible variation of mains voltage: ±10 % Permissible variation of mains frequency: ±5 % Further mains voltages on request.	
Cable length	Max. 100 m between actuator and AC 01.2 actuator controls	
Ambient temperature	Weatherproof –30 °C to +70 °C Explosion-proof: –30 °C to +40 °C / +60 °C	



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