

VARIABLE SPEED MULTI-TURN ACTUATORS

for closed-loop and open-loop control in industrial valve automation



Multi-turn actuators SAV 07.2 – SAV 16.2 for open-close duty and SARV 07.2 – SARV 16.2 for modulating duty are paired with intelligent ACV .2 actuator controls. The proven AUMA SA/SAR range is enhanced by variable speed models. AUMA is spearheading market technology offering a wide speed control ratio of 1 to 10.

Variable speed offers significant advantages. For any change of valve position, the optimum operating speed can be adjusted. To optimise this competence, new functions have been integrated into AUMA ACV actuator controls.

Soft start and soft stop

Operations out of an end position start at zero speed. By means of a ramp function, speed is increased until the predefined value is reached. Soft stop is the exact opposite. Prior to reaching the end position, the speed is linearly decreased. The advantage is gentle operation for all valve and actuator components subject to wear.

Higher positioning accuracy

For operation into the end position, the actuator decreases the operating speed when approaching the valve setpoint position down to zero speed. This allows for more accurate approaching of the setpoint compared to the sudden tripping of a fixed speed actuator. This ability is particularly crucial for the SARV modulating duty model.

External impact on speed

The variable actuator speed is an additional control variable to optimise a control process within the control system. To this end, the SARV speed can be adjusted by an external input.

Avoiding pressure surges by speed profile

Closing at excessive speed results in pressure surges and might cause overloads in both valves and pipeline systems depending on flow conditions. If worst comes to worst, the pipe might burst. ACV speed profiles are the ideal solution for controlling closing procedures and maintaining loads within the permissible range. Speed values may be specified for up to ten sections of travel irrespective of the direction of operation. Thus, the operating speed profile can be tailored to the specific valve requirements.

EMERGENCY operation at predefined speed

As an option, EMERGENCY and failure operations can be executed at a predefined speed to suit the particular event. By selecting a high speed still acceptable for the process, the safe state can be reached faster.

Synchronous link

This function characterises synchronous operation of two actuators in spite of the absence of mechanical links. The double spindles of large weir penstocks, for example, can be operated synchronously – the optimum solution if a mechanical link is difficult to implement or is not possible at all.

TECHNICAL DATA

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

Types of duty

The actuators are generally sized for duty types according to EN 15714-2:

- > SAV: Class A or open-close duty (S2 - 15 min/30 min)
- > SAV: Class B or inching/positioning duty (S2 - 15 min/30 min)
- > SARV: Class C or modulating duty S4 - 25 %/50 %

Ambient temperatures

> -30 °C to +70 °C

Supply voltages

> 3-phase AC current 50/60 Hz maximum mains voltage 480 V

> 1-phase AC current 50/60 Hz maximum mains voltage 240 V

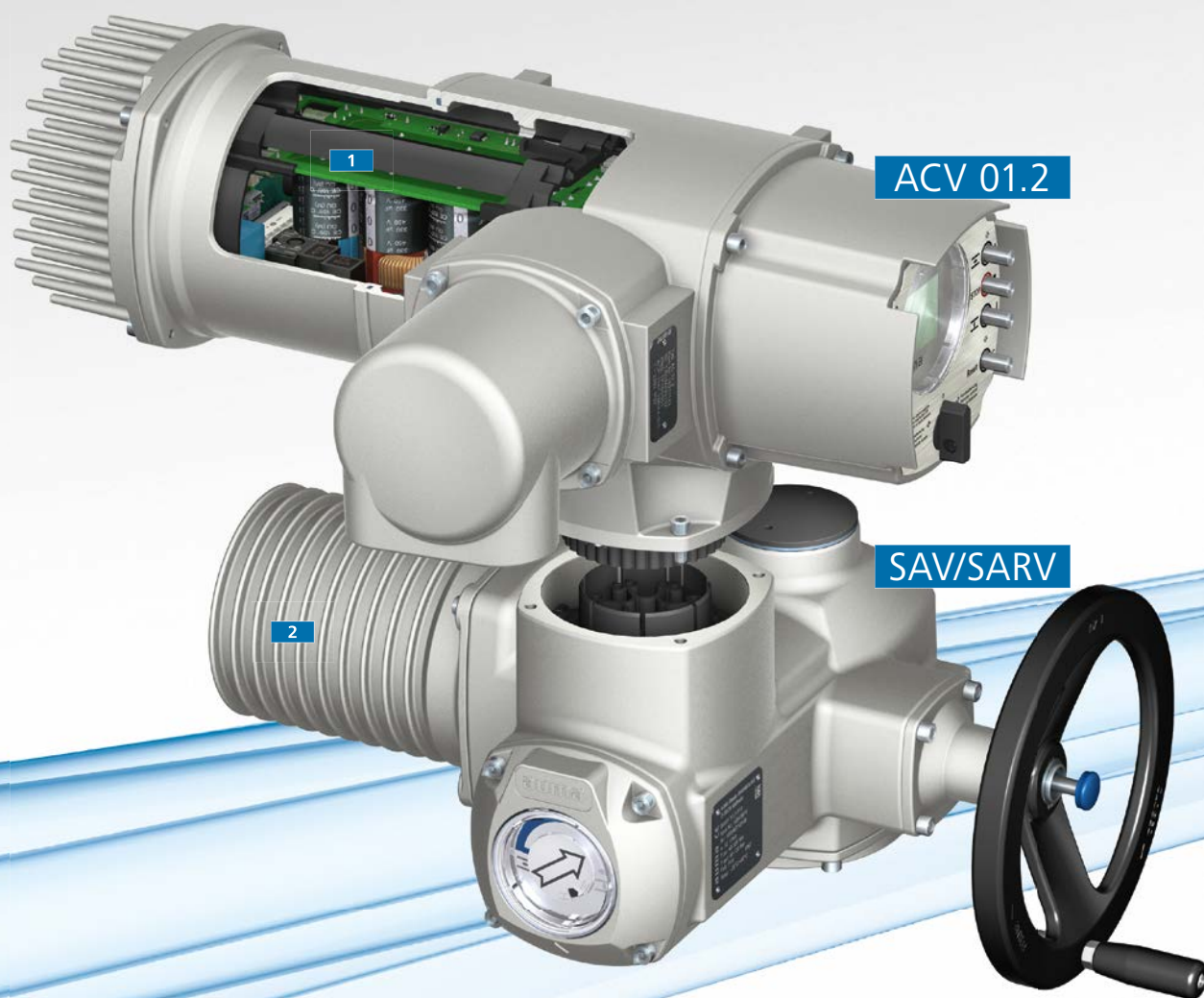
Positioning accuracy

The actuators achieve a positioning accuracy of < 0.2 %.

The following table applies to actuators with 380 V – 480 V 3-phase AC supply in type of duty S2 - 15 min or S4 - 25 %.

Type	Speed ranges			Setting range for tripping torque				Maximum torque for modulating duty			Starting frequency for modulating duty max. number of starts		
	[rpm]			min.	max. [Nm]			[Nm]			[1/h]		
SAV 07.2	6 – 60	12 – 120	24 – 240	10	30	30	25	–	–	–	–	–	–
SARV 07.2	6 – 60	12 – 120	24 – 240	15	30	30	25	15	15	15	1,500	1,500	1,200
SAV 07.6	6 – 60	12 – 120	24 – 240	20	60	60	50	–	–	–	–	–	–
SARV 07.6	6 – 60	12 – 120	24 – 240	30	60	60	50	30	20	20	1,500	1,500	1,200
SAV 10.2	6 – 60	12 – 120	24 – 240	40	120	120	100	–	–	–	–	–	–
SARV 10.2	6 – 60	12 – 120	24 – 240	60	120	120	100	60	50	50	1,500	1,500	1,200
SAV 14.2	6 – 60	12 – 120	24 – 240	100	250	250	200	–	–	–	–	–	–
SARV 14.2	6 – 60	12 – 120	24 – 240	120	250	250	200	120	100	100	1,200	1,200	600
SAV 14.6	6 – 60	12 – 120	24 – 240	200	500	500	400	–	–	–	–	–	–
SARV 14.6	6 – 60	12 – 120	24 – 240	250	500	400	400	175	150	150	1,200	1,200	600
SAV 16.2	6 – 60	–	–	400	1,000	–	–	–	–	–	–	–	–
SARV 16.2	6 – 60	–	–	500	1,000	–	–	350	–	–	900	–	–

Depending on the torque range, restrictions for the maximum ambient temperature will apply



AUMA variable speed multi-turn actuators are the combination of SAV/SARV actuators and ACV 01.2 actuator controls. Variable speed is achieved by the integral frequency converter within the actuator controls. ACV 01.2 are based on the intelligent AC 01.2 actuator controls. Operation and integration of ACV into the DCS is comparable to AC.

By their design, SAV and SARV differ on a few points from SA and SAR actuators. The renamed type designation identifies the use of actuators paired with ACV 01.2 actuator controls.

1 Frequency converter

Frequency converters are the perfect choice for providing 3-phase AC motors with variable speed. The converter specifically developed by AUMA excels by maintaining constant torque availability across a broad speed range.

The converter ensures that the actuator can be supplied with 1-phase AC voltage in spite of using a 3-phase AC motor. Voltage and frequency fluctuations are compensated by the converter. At the same time, the converter eliminates high start-up currents which are usually generated at actuator start.

2 3-phase AC motor

Irrespective of the type of power supply with 3-phase or 1-phase AC current, actuators are always equipped with a specially designed 3-phase AC motor. The frequency converter converts the supply voltage applied into an appropriate voltage for the 3-phase AC motor.

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