Technical data Actuator controls

General information

Actuator controls AC 01.2 for controlling multi-turn actuators of the SA/SAR type range and part-turn actuators of the SQ/SQR .2 type range.

Features and functions

Power supply

Standard voltages AC:

3-phase AC current Voltages/frequencies								**1-phase AC current** Voltages/frequencies		
Volt	380	400	415	440	460	480	500	Volt	110, 115, 120	220, 230, 240
Hz	50	50	50	60	60	60	50	Hz	60	50

Special voltages AC:

3-phase AC current Voltages/frequencies										**1-phase AC current** Voltages/frequencies	
Volt	220	230	240	525	575	575	600	660	690	Volt	208
Hz	50	50	50	50	50	60	60	50	50	Hz	60

Permissible variation of mains voltage: ±10 %

Permissible variation of mains voltage: ±30 % (option)

Permissible variation of mains frequency: ±5 %

Special voltages DC: (on request)

DC Voltages						
Volt	24	48	60	110	125	220

Permissible voltage deviation: (on request)

External supply of the electronics (option)

24 V DC: +20 %/–15 %,

Current consumption: Basic version approx. 250 mA, with options up to 500 mA

External power supply must have reinforced insulation against mains voltage in accordance with IEC 61010-1 and may only be supplied by a circuit limited to 150 VA in accordance with IEC 61010-1.

Current consumption

Current consumption of controls depending on mains voltage:

For permissible variation of mains voltage of ±10 %:

- 100 to 120 V AC = max. 740 mA
- 208 to 240 V AC = max. 400 mA
- 380 to 500 V AC = max. 250 mA
- 515 to 690 V AC = max. 200 mA

For permissible variation of mains voltage of ±30 %:

- 100 to 120 V AC = max. 1,200 mA
- 208 to 240 V AC = max. 750 mA
- 380 to 500 V AC = max. 400 mA
- 515 to 690 V AC = max. 400 mA

Overvoltage category

Category III according to IEC 60364-4-443

Rated power

Actuator controls are designed for rated motor power (refer to Electrical data Multi-turn or Part-turn actuators)

Switchgear

Standard:	Reversing contactors (mechanically and electrically interlocked) for AUMA power classes A1/A2
Options:	Reversing contactors (mechanically and electrically interlocked) for AUMA power class A3
	Thyristor unit for mains voltage up to 500 V AC (recommended for modulating actuators) for AUMA power classes B1, B2 and B3

The reversing contactors are designed for a lifetime of 2 million starts. For applications requiring a high number of starts, we recommend the use of thyristor units.

For the assignment of AUMA power classes, please refer to Electrical data Multi-turn or Part-turn actuators.

Control inputs

6 digital inputs: OPEN, STOP, CLOSE, EMERGENCY (via opto-isolator, OPEN, STOP, CLOSE with one common and EMERGENCY without common, respect minimum pulse duration for modulating actuators.

Control voltage/current consumption for control inputs

Standard:	24 V DC, current consumption: approx. 10 mA per input
Options:	48 V DC, current consumption: approx. 7 mA per input
	60 V DC, current consumption: approx. 9 mA per input
	115 V DC, current consumption: approx. 15 mA per input
	100 – 120 V AC, Current consumption: approx. 15 mA per input

All input signals must be supplied with the same potential.

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Status signals (output signals)	Standard:	• 6 programmable output contacts: - 5 potential-free NO contacts with one common, max. 250 V AC, 1 A (resistive load) Default configuration: End position CLOSED, end position OPEN, selector switch REMOTE, torque fault CLOSE, torque fault OPEN - 1 potential-free change-over contact, max. 250 V AC, 5 A (resistive load) Default configuration: Collective fault signal (torque fault, phase failure, motor protection tripped) • Analogue output signal for position feedback - Galvanically isolated position feedback 0/4 – 20 mA (load max. 500 Ω)
	Options:	• 6 programmable output contacts: - 5 change-over contacts with one common, max. 250 V AC, 1 A (resistive load), 1 potential-free change-over contact, max. 250 V AC, 5 A (resistive load) • 12 programmable output contacts: - 10 potential-free NO contacts, 5 with one common each, max. 250 V AC, 1 A (resistive load), 2 potential-free change-over contacts, max. 250 V AC, 5 A (resistive load) • 6 programmable output contacts: - 6 potential-free change-over contacts without one common, per contact max. 250 V AC, 5 A (resistive load) • 10 programmable output contacts: - 10 potential-free change-over contacts without one common, per contact max. 250 V AC, 5 A (resistive load) • 6 programmable output contacts: - 4 mains failure proof potential-free NO contacts with one common, max. 250 V AC, 1 A (resistive load), 1 potential-free NO contact, max. 250 V AC, 1 A (resistive load), 1 potential-free change-over contact, max. 250 V AC, 5 A (resistive load) • 6 programmable output contacts: - 4 mains failure proof potential-free NO contacts, max. 250 V AC, 1 A (resistive load), 2 potential-free NO contacts, max. 250 V AC, 1 A (resistive load), • 12 programmable output contacts: - 8 mains failure proof potential-free NO contacts, max. 250 V AC, 1 A (resistive load), 2 potential-free NO contacts, max. 250 V AC, 1 A (resistive load), 2 potential-free change-over contacts, max. 250 V AC, 5 A (resistive load) • 12 programmable output contacts: - 8 mains failure proof potential-free NO contacts, max. 250 V AC, 1 A (resistive load), 4 potential-free NO contacts, max. 250 V AC, 1 A (resistive load), All output signals must be supplied with the same potential.
Voltage output	Standard:	Auxiliary voltage 24 V DC: max. 100 mA for supply of control inputs, galvanically isolated from internal voltage supply.
	Option:	Auxiliary voltage 115 V AC: max. 30 mA for supply of control inputs, galvanically isolated from internal voltage supply (Not possible in combination with PTC tripping device)
Analogue output	Option:	2 analogue outputs: With position transmitter option: Output of travel, torque or output speed as continuous values between 0/4 and 20 mA
Analogue input	Option:	2 analogue inputs: With positioner/process controller option: Input of actual position value/actual process value as continuous values between 0/4 and 20 mA
Local controls	Standard:	• Selector switch: LOCAL - OFF - REMOTE (lockable in all three positions) • Push buttons: OPEN, STOP, CLOSE, RESET - Local STOP The actuator can be stopped via push button STOP of local controls if the selector switch is in position REMOTE. (Not activated when leaving the factory) • 6 indication lights: - End position and running indication CLOSED (yellow), torque fault CLOSE (red), motor protection tripped (red), torque fault OPEN (red), end position and running indication OPEN (green), Bluetooth (blue) • Graphic LC display: illuminated
	Option:	• Special colours for the indication lights: - End position CLOSED (green), torque fault CLOSE (blue), torque fault OPEN (yellow), motor protection tripped (violet), end position OPEN (red)

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Bluetooth communication interface	Bluetooth class II chip, version 2.1: with a range up to 10 m in industrial environments, supports the SPP Bluetooth profile (Serial Port Profile). Required accessories: AUMA CDT (Commissioning and Diagnostic Tool for Windows-based PC)	
Application functions	Standard:	• Selectable type of seating, limit or torque seating for end position OPEN and end position CLOSED • Torque by-pass: Adjustable duration (with adjustable peak torque during start-up time) • Start and end of stepping mode as well as ON and OFF times: can be set individually for directions OPEN and CLOSE, 1 to 1,800 seconds • Any 8 intermediate positions: can be set between 0 and 100 %, reaction and signal behaviour programmable • Running indication blinking: can be set
	Options:	• Positioner: - Position setpoint via analogue inputs 0/4 – 20 mA - Programmable behaviour on loss of signal - Automatic adaptation of dead band (adaptive behaviour selectable) - Split range operation - MODE input for selecting between open-close and setpoint control • PID process controller: with adaptive positioner, via 0/4 – 20 mA inputs for process setpoint and actual process value • Multiport valve: up to 12 positions, signals (pulse or edge) • Automatic deblocking: up to 5 operation trials, travel time in opposite direction can be set • Static and dynamic torque recording for both rotation directions with torque measurement flange as additional accessory
Safety functions	Standard:	• EMERGENCY operation (programmable behaviour) - Digital input: Low active - Reaction can be selected: Stop, run to end position CLOSED, run to end position OPEN, run to intermediate position - Torque monitoring can be by-passed during EMERGENCY operation - Thermal protection can be by-passed during EMERGENCY operation (only in combination with thermoswitch within actuator, not with PTC thermistor).
	Options:	• Enabling local controls via digital input Enable LOCAL: Thus, actuator operation can be enabled or disabled via push buttons on the local controls. • Interlock for main/by-pass valve: Enabling the operation commands OPEN or CLOSE via two digital inputs • EMERGENCY Stop push button (latching): interrupts electrical operation, irrespective of the selector switch position. • PVST (Partial Valve Stroke Test): programmable to check the function of both actuator and actuator controls: Direction, stroke, operation time, reversing time
Monitoring function	• Valve overload protection: adjustable, results in switching off and generates fault signal • Motor temperature monitoring (thermal monitoring): results in switching off and generates fault indication • Monitoring the heater within actuator: generates warning signal • Monitoring of permissible on-time and number of starts: adjustable, generates warning signal • Operation time monitoring: adjustable, generates warning signal • Phase failure monitoring: results in switching off and generates fault signal • Automatic correction of rotation direction upon wrong phase sequence (3-ph AC current)	
Diagnostic function	• Electronic device ID with order and product data • Logging of operating data: A resettable counter and a lifetime counter each for: - Motor running time, number of starts, torque switch trippings in end position CLOSED, limit switch trippings in end position CLOSED, torque switch trippings in end position OPEN, limit switch trippings in end position OPEN, torque faults CLOSE, torque faults OPEN, motor protection trippings • Time-stamped event report with history for setting, operation and faults: - Status signals according to NAMUR recommendation NE 107: "Failure", "Function check", "Out of specification", "Maintenance required" • Torque characteristics (for version with MWG in actuator): - 3 torque characteristics (torque-travel characteristic) for opening and closing directions can be saved separately. - Torque characteristics stored can be shown on the display.	

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Motor protection evaluation	Standard:	• Monitoring the motor temperature in combination with thermoswitches within actuator motor
	Options:	• Thermal overload relay in controls combined with thermoswitches within actuator • PTC tripping device in combination with PTC thermistors within actuator motor
Electrical connection	Standard:	AUMA plug/socket connector with screw-type connection
	Options:	• Terminals or crimp connection • Gold-plated control plug (sockets and plugs)
Threads for cable entries	Standard:	Metric threads
	Options:	PG-threads, NPT-threads, G-threads
Wiring diagram (basic version)	TPCA-0A1-1C1-A000 TPA00R1AA-0A1-000	

Further options for version with MWG in actuator	
Setting of limit and torque switching via local controls	
Torque feedback signal	Galvanically isolated analogue output 0/4 – 20 mA (load max. 500 Ω)
Wiring diagram (basic version)	TPCA-0A1-1C1-A000 TPA00R100-0I1-000

Service conditions		
Use	Indoor and outdoor use permissible	
Mounting position	Any position	
Installation altitude	≤ 2,000 m above sea level > 2,000 m above sea level on request	
Ambient temperature	Standard:	–30 °C to +70 °C
	Options:	–60 °C to +60 °C, extreme low temperature version
		Low temperature versions incl. heating system for connection to external power supply 230 V AC or 115 V AC.
Humidity	Up to 100 % relative humidity across the entire permissible temperature range	
Enclosure protection according to EN 60529	Standard:	IP68 with AUMA 3-phase AC motor/1-phase AC motor For special motors, differing enclosure protection is possible
	Option:	DS Terminal compartment additionally sealed against interior (double sealed)
	According to AUMA definition, enclosure protection IP68 meets the following requirements: • Depth of water: maximum 8 m head of water • Duration of continuous immersion in water: Max. 96 hours • Up to 10 operations during continuous immersion • Modulating duty is not possible during continuous immersion.	
Pollution degree according to IEC 60664-1	Pollution degree 4 (when closed), pollution degree 2 (internal)	
Vibration resistance according to IEC 60068-2-6	1 g, from 10 Hz to 200 Hz Resistant to vibration during start-up or for failures of the plant. However, a fatigue strength may not be derived from this. (Not valid in combination with gearboxes)	
Corrosion protection	Standard:	KS: Suitable for use in areas with high salinity, almost permanent condensation, and high pollution.
	Options:	KX: Suitable for use in areas with extremely high salinity, permanent condensation, and high pollution.
Top coat	Double layer powder coating Two-component iron-mica combination	
Colour	Standard:	AUMA silver-grey (similar to RAL 7037)
	Option:	Available colours on request

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Accessories	
Wall bracket	For AC 01.2 mounting separately from the actuator, including plug/socket connector, connecting cable on request Recommended for high ambient temperatures, difficult access, or heavy vibration during service. Cable length between actuator and AC 01.2 max. 100 m. (Not suitable for version with potentiometer in the actuator.) Instead of the potentiometer, the actuator has to be equipped with an electronic position transmitter. (Cable length for non-intrusive version with MWG in the actuator max. 100 m requires separate data cable for MWG.)
Programming software	AUMA CDT (Commissioning and Diagnostic Tool for Windows-based PC)
Torque measurement flange DMF	Accessory for torque measurement for SA/SAR 07.2 to SA/SAR 16.2

Further information	
Weight	Approx. 7 kg (with AUMA plug/socket connector)
EU Directives	Electromagnetic Compatibility (EMC): (2004/108/EC) Low Voltage Directive: (2006/95/EC) Machinery Directive: (2006/42/EC)
Reference documents	Brochure Electric actuators for industrial valve automation Dimensions Multi-turn actuators with AUMATIC integral controls Dimensions Part-turn actuators with AUMATIC integral controls