## Technical data Actuator controls

| General information | | |
|---|---|---|
| ACExC 01.2 actuator controls for controlling multi-turn actuators of the SAEx/SAREx .1, SAEx/SAREx .2 type ranges and part-turn actuators of the SQEx/SQREx .2 type range. | | |
| **Features and functions** | | |
| Explosion protection | Standard: | II2G Ex de IIC T4 or T3 Gb<br>II2D Ex tb IIIC T130 °C or T190 °C Db IP6x |
| | Option: | II2G Ex d IIC T4 or T3 Gb |
| Product certificates | In combination with SAEx: DEKRA 11ATEX0008 X<br>In combination with SQEx: DEKRA 13ATEX0016 X | |
| Power supply | Standard voltages AC:<br>Refer to table: 3-phase AC standard voltages [▶ 4]<br>Refer to table: 1-phase AC standard voltages [▶ 4]<br>Special voltages AC:<br>Refer to table: 3-phase AC special voltages [▶ 4]<br>Refer to table: 1-phase AC special voltages [▶ 4]<br>Permissible variation of mains voltage: ±10 %<br>Permissible variation of mains voltage: ±30 % (option)<br>Permissible variation of mains frequency: ±5 %<br>DC standard voltages:<br>Refer to table: DC standard voltages for multi-turn actuators [▶ 4],<br>DC standard voltages for part-turn actuators [▶ 4]<br>Special voltages DC: On request<br>Permissible voltage deviation: On request | |
| External supply of the electronics (option) | 24 V DC: +20%/-15%<br>Current consumption: Basic version approx. 250 mA, with options up to 500 mA<br>For external electronics supply, the power supply of integral controls must have an enhanced isolation against mains voltage in compliance with IEC 61010-1 and the output power be limited to 150 VA. | |
| Current consumption | Current consumption of controls depending on mains voltage:<br>For permissible variation of mains voltage of ±10 %:<br>• 100 to 120 V AC = max. 740 mA<br>• 208 to 240 V AC = max. 400 mA<br>• 380 to 500 V AC = max. 250 mA<br>• 515 to 690 V AC = max. 200 mA<br>For permissible variation of mains voltage of ±30 % (as an option):<br>• 100 to 120 V AC = max. 1,200 mA<br>• 208 to 240 V AC = max. 750 mA<br>• 380 to 500 V AC = max. 400 mA<br>• 515 to 690 V AC = max. 400 mA | |
| Overvoltage category | Category III according to IEC 60364-4-44 | |
| Rated power | Actuator controls are designed for nominal motor power, refer to Electrical data pertaining to the actuator. | |
| 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 600 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.<br>For the assignment of AUMA power classes, please refer to electrical data on actuator. | |
| Control inputs | 6 digital inputs: OPEN, STOP, CLOSE, EMERGENCY (via opto-isolator, thereof OPEN, STOP, CLOSE with one common and EMERGENCY without common, minimum pulse duration: 100 ms, respect max. number of starts 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<br>60 V DC, current consumption: approx. 9 mA per input<br>100 – 125 V DC, current consumption: approx. 15 mA per input<br>100 – 120 V AC, current consumption: approx. 15 mA per input |

| Features and functions | | |
|---|---|---|
| Status signals<br>(output signals) | Standard: | • 6 programmable output contacts:<br>– 5 potential-free NO contacts with one common, max. 250 V AC, 1 A (resistive load)<br>Default configuration: End position CLOSED, end position OPEN, selector switch REMOTE, torque fault CLOSE, torque fault OPEN<br>– 1 potential-free change-over contact, max. 250 V AC, 5 A (resistive load)<br>Default configuration: Collective fault signal (torque fault, phase failure, motor protection tripped) |
| | Options: | • 6 programmable output contacts:<br>– 5 potential-free 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)<br>• 12 programmable output contacts:<br>– 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)<br>• 6 programmable output contacts:<br>– 6 potential-free change-over contacts without one common, per contact max. 250 V AC, 5 A (resistive load)<br>• 10 programmable output contacts:<br>– 10 potential-free change-over contacts without one common, per contact max. 250 V AC, 5 A (resistive load)<br>• 6 programmable output contacts:<br>– 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)<br>• 6 programmable output contacts:<br>– 4 mains failure proof potential-free NO contacts, max. 250 V AC, 5 A (resistive load), 2 potential-free change-over contacts, max. 250 V AC, 5 A (resistive load)<br>• 12 programmable output contacts:<br>– 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)<br>• 12 programmable output contacts:<br>– 8 mains failure proof potential-free NO contacts, max. 250 V AC, 5 A (resistive load), 4 potential-free change-over contacts, max. 250 V AC, 5 A (resistive load)<br>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<br>(Not possible in combination with PTC tripping device) |
| Analogue output | • Actuator with MWG (non-intrusive)<br>– 2 analogue outputs (galvanically isolated):<br>Position feedback signal and torque feedback signal as continuous 0/4 – 20 mA value (load max. 500 Ω)<br>• Actuator with potentiometer (intrusive):<br>– 1 analogue output (galvanically isolated):<br>Position feedback as continuous 0/4 – 20 mA value (load max. 500 Ω) | |
| Analogue input (option) | 2 analogue inputs (galvanically isolated):<br>With positioner/process controller option: Connection of position setpoint/actual process value as continuous 0/4 – 20 mA values | |

| Features and functions | | |
|---|---|---|
| Local controls | Standard: | • Selector switch LOCAL - OFF - REMOTE (lockable in all three positions)<br>• Push buttons OPEN, STOP, CLOSE, RESET<br>– Local STOP<br>The actuator can be stopped via push button STOP of local controls if the selector switch STOP is in position REMOTE. (Not activated when leaving the factory.)<br>• 6 indication lights:<br>– 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)<br>• Graphic LC display: illuminated |
| | Options: | • Special colours for the indication lights:<br>– End position CLOSED (green), torque fault CLOSE (blue), torque fault OPEN (yellow), motor protection tripped (violet), end position OPEN (red) |
| Bluetooth<br>Communication interface | Bluetooth version 4.2 + EDR: With a range up to 10 m in industrial environments supports the SSP Bluetooth profile (Serial Port Profile). Permanently active/inactive, deactivation/activation from REMOTE or selector switch.<br>Required accessories:<br>• AUMA CDT (Commissioning and Diagnostic Tool for Windows-based PCs)<br>• AUMA Assistant App (Commissioning and Diagnostic Tool for Android and iOS devices) | |
| Application functions | Standard: | • Selectable type of seating, limit or torque seating for end position OPEN and end position CLOSED<br>• Torque bypass: Adjustable duration (with adjustable peak torque during start-up time)<br>• 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<br>• Any 8 intermediate positions between 0 and 100 %, reaction and signal behaviour programmable<br>• Running indication blinking: can be set |
| | Options: | • Positioner:<br>– Position setpoint via analogue input 0/4 – 20 mA<br>– Programmable behaviour on loss of signal<br>– Automatic adaptation of the dead band (adaptive behaviour can be selected)<br>– Split range operation<br>– MODE input for selecting between OPEN-CLOSE and setpoint control<br>• PID process controller: with adaptive positioner, via 0/4 – 20 mA analogue inputs for process setpoint and actual process value<br>• Automatic deblocking: Up to 5 operation trials, travel time in opposite direction can be set |
| Safety functions | Standard: | • EMERGENCY operation: (programmable behaviour)<br>– Digital input: Low active<br>– Reaction can be selected: STOP, run to end position CLOSED, run to end position OPEN, run to intermediate position<br>– Torque monitoring can be bypassed during EMERGENCY operation<br>– Thermal protection can be bypassed 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 local controls.<br>• Interlock function: Enabling the operation commands OPEN or CLOSE via two digital inputs<br>• PVST (Partial Valve Stroke Test): programmable to check the function of both actuator and actuator controls: Direction, stroke, operation time, reversing time |
| Monitoring functions | • Valve overload protection: adjustable, results in switching off and generates fault signal<br>• Motor temperature monitoring (thermal monitoring): results in switching off and generates fault indication<br>• Monitoring the heater within actuator: generates warning signal<br>• Monitoring of permissible on-time and number of starts: adjustable, generates warning signal<br>• Operation time monitoring: adjustable, generates warning signal<br>• Phase failure monitoring: results in switching off and generates fault signal<br>• Automatic correction of rotation direction upon wrong phase sequence (3-ph AC current) | |

## Technical data Actuator controls

| Features and functions | | |
|---|---|---|
| Diagnostic functions | • Electronic device ID with order and product data<br>• Logging of operating data: A resettable counter and a lifetime counter each for:<br>– 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<br>• Time-stamped event report with history for setting, operation and faults<br>• Status signals according to NAMUR recommendation NE 107: “Failure", "Function check", "Out of specification", "Maintenance required"<br>• Torque characteristics (for version with MWG in actuator):<br>– 3 torque characteristics (torque-travel characteristic) for opening and closing directions can be saved separately.<br>– Torque characteristics stored can be shown on the display. | |
| Motor protection evaluation | Standard: | PTC tripping device in combination with PTC thermistors within actuator motor |
| | Option: | Thermal overload relay in actuator controls combined with thermoswitches within actuator |
| Electrical connection | Standard: | AUMA Ex plug/socket connector (KT); screw-type motor terminals; push-in type control terminals |
| | Options: | • AUMA Ex plug/socket connector with terminal blocks (KES), increased safety Ex e<br>• AUMA Ex plug/socket connector with terminal blocks (KES), flameproof enclosure Ex d |
| Threads for cable entries | Standard: | Metric threads |
| | Option: | Pg threads, NPT threads, G threads |
| Wiring diagram (basic version) | TPCA-0A1-1C1-AA20 TPA00R2AA-0A1-000 | |

*Table 1:* 3-phase AC standard voltages

| Voltages/frequencies | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Volt [3~] | 220 | 230 | 380 | 380 | 400 | 400 | 415 | 440 | 460 | 480 | 500 |
| Hz | 60 | 50 | 50 | 60 | 50 | 60 | 50 | 60 | 60 | 60 | 50 |

*Table 2:* 1-phase AC standard voltages

| Voltages/frequencies | | | | |
|---|---|---|---|---|
| Volt [1~] | 110 – 120 | 110 – 120 | 220 – 240 | 220 – 240 |
| Hz | 50 | 60 | 50 | 60 |

*Table 3:* 3-phase AC special voltages

| Voltages/frequencies | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Volt [3~] | 220 | 240 | 525 | 575 | 575 | 600 | 660 | 690 | 690 |
| Hz | 50 | 50 | 50 | 50 | 60 | 60 | 50 | 50 | 60 |

*Table 4:* 1-phase AC special voltages

| Voltages/frequencies | |
|---|---|
| Volt [1~] | 208 |
| Hz | 60 |

*Table 5:* DC standard voltages for multi-turn actuators

| Voltage | |
|---|---|
| Volt [dc] | 24 |

*Table 6:* DC standard voltages for part-turn actuators

| Voltages | | | |
|---|---|---|---|
| Volt [dc] | 24 | 110 | 220 |

| 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 – 20mA (load max. 500 Ω) |
| Wiring diagram (basic version) | TPCA-0A1-1C1-AA20 TPA00R200-0I1-000 |

| Service conditions | |
|---|---|
| Use | Indoor and outdoor use permissible |
| Mounting position | Any position |
| Installation altitude | ≤ 2,000 m above sea level<br>> 2,000 m above sea level on request |

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|---|---|---|
| **Service conditions** | | |
| Ambient temperature | Standard: | –30 °C to +40 °C/+60 °C |
| | Options: | –40 °C to +40 °C/+60 °C, low temperature version<br>–60 °C to +40 °C/+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 or internal version 400 V AC |
| Humidity | Up to 100 % relative humidity across the entire permissible temperature range | |
| Enclosure protection in accordance with IEC 60529 | IP68<br>Terminal compartment additionally sealed against interior of actuator controls (double sealed) | |
| | According to AUMA definition, enclosure protection IP68 meets the following requirements:<br>• Depth of water: maximum 8 m head of water<br>• Continuous immersion in water: maximum 96 hours<br>• Up to 10 operations during immersion<br>• Modulating duty is not possible during immersion. | |
| Pollution degree according to IEC 60664-1 | Pollution degree 4 (when closed), pollution degree 2 (internal) | |
| Vibration resistance according to EN 60068-2-6 | 1 g, from 10 Hz to 200 Hz<br>Resistant to vibration during start-up or for plant failures. However, a fatigue strength may not be derived from this. (Not valid in combination with gearboxes) | |
| Corrosion protection | Standard: | KS<br>Suitable for use in areas with high salinity, almost permanent condensation, and high pollution. |
| | Option: | KX<br>Suitable for use in areas with extremely high salinity, permanent condensation, and high pollution. |
| Coating | Double layer powder coating | |
| Colour | Standard: | AUMA silver-grey (similar to RAL 7037) |
| | Option: | Available colours on request |
| **Accessories** | | |
| Wall bracket | For actuator controls mounted separately from the actuator, including plug/socket connector.<br>Connecting cable on request.<br>Recommended for high ambient temperatures, difficult access, or in case of heavy vibration during service.<br>Cable length between actuator and actuator controls is max. 100 m. An MWG is required for position feedback. | |
| Programming software | AUMA CDT (Commissioning and Diagnostic Tool for Windows-based PCs/notebooks)<br>AUMA Assistant App (Commissioning and Diagnostic Tool for Android and iOS devices) | |
| **Further information** | | |
| Weight | Approx. 12 kg (with AUMA KT Ex plug/socket connector) | |
| EU Directives | ATEX Directive 2014/34/EU<br>Machinery Directive 2006/42/EC<br>Low Voltage Directive 2014/35/EU<br>EMC Directive 2014/30/EU<br>RoHS Directive 2011/65/EU | |
| Reference documents | Dimensions SAEx 07.2 – SAEx 16.2/SAREx 07.2 – SAREx 16.2 with ACExC 01.2<br>Dimensions SQEx 05.2 – SQEx 14.2/SQREx 05.2 – SQREx 14.2 with ACExC 01.2<br>Electrical data SAEx 07.2 – SAEx 16.2/SAREx 07.2 – SAREx 16.2<br>Electrical data SQEx 05.2 – SQEx 14.2/SQREx 05.2 – SQREx 14.2 | |