### General information

AUMA NORM multi-turn actuators require electric controls. For the SAEx type range, AUMA offers AMExC and ACExC actuator controls. These can also easily be mounted to the actuator at a later date.

| Type | Output speed rpm | | Torque range[1] | | Run torque[2] | Number of starts[3] | Valve attachment[4] | | | Handwheel | | Weight[5] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 50 Hz | 60 Hz | Min. [Nm] | Max. [Nm] | Max. [Nm] | Starts Max. [1/h] | Standard EN ISO 5210 | Option DIN 3210 | Max. Ø rising stem [mm] | Ø [mm] | Reduction ratio | approx. [kg] |
| SAEx 07.2 | 4 | 4.8 | 10 | 30 | 11 | 60 | F07 F10 | – G0 | 26 34 | 160 | 11 : 1 | 28 |
| | 5.6 | 6.7 | | | | | | | | | 8 : 1 | |
| | 8 | 9.6 | | | | | | | | | 11 : 1 | |
| | 11 | 13 | | | | | | | | | 8 : 1 | |
| | 16 | 19 | | | | | | | | | 11 : 1 | |
| | 22 | 26 | | | | | | | | | 8 : 1 | |
| | 32 | 38 | | | | | | | | | 11 : 1 | 31 |
| | 45 | 54 | | | | | | | | | 8 : 1 | |
| | 63 | 75 | | | | 30 | | | | | 11 : 1 | |
| | 90 | 108 | | | | | | | | | 8 : 1 | |
| | 125 | 150 | | | | | | | | | 5.5 : 1 | |
| | 180 | 216 | | 25 | 10 | | | | | | 4 : 1 | |
| SAEx 07.6 | 4 | 4.8 | 20 | 60 | 21 | 60 | F07 F10 | – G0 | 26 34 | 160 | 11 : 1 | 28 |
| | 5.6 | 6.7 | | | | | | | | | 8 : 1 | |
| | 8 | 9.6 | | | | | | | | | 11 : 1 | |
| | 11 | 13 | | | | | | | | | 8 : 1 | |
| | 16 | 19 | | | | | | | | | 11 : 1 | |
| | 22 | 26 | | | | | | | | | 8 : 1 | |
| | 32 | 38 | | | | | | | | | 11 : 1 | 31 |
| | 45 | 54 | | | | | | | | | 8 : 1 | |
| | 63 | 75 | | | 15 | 30 | | | | | 11 : 1 | 40 |
| | 90 | 108 | | | | | | | | | 8 : 1 | |
| | 125 | 150 | | | | | | | | | 5.5 : 1 | |
| | 180 | 216 | | 50 | | | | | | | 4 : 1 | |
| SAEx 10.2 | 4 | 4.8 | 40 | 120 | 42 | 60 | F10 | G0 | 40 | 200 | 11 : 1 | 32 |
| | 5.6 | 6.7 | | | | | | | | | 8 : 1 | |
| | 8 | 9.6 | | | | | | | | | 11 : 1 | 35 |
| | 11 | 13 | | | | | | | | | 8 : 1 | |
| | 16 | 19 | | | | | | | | | 11 : 1 | |
| | 22 | 26 | | | | | | | | | 8 : 1 | |
| | 32 | 38 | | | | | | | | | 11 : 1 | 44 |
| | 45 | 54 | | | | 30 | | | | | 8 : 1 | |
| | 63 | 75 | | | | | | | | | 11 : 1 | 47 |
| | 90 | 108 | | | 35 | | | | | | 8 : 1 | |
| | 125 | 150 | | | | | | | | | 5.5 : 1 | |
| | 180 | 216 | | 100 | | | | | | | 4 :1 | |
| SAEx 14.2 | 4 | 4.8 | 100 | 250 | 100 | 60 | F14 | G1/2 | 58 | 315 | 11 : 1 | 63 |
| | 5.6 | 6.7 | | | | | | | | | 8 : 1 | |
| | 8 | 9.6 | | | | | | | | | 11 : 1 | |
| | 11 | 13 | | | | | | | | | 8 : 1 | |
| | 16 | 19 | | | | | | | | | 11 : 1 | 65 |
| | 22 | 26 | | | | 30 | | | | | 8 : 1 | |
| | 32 | 38 | | | | | | | | | 11 : 1 | 67 |
| | 45 | 54 | | | | | | | | | 8 : 1 | |
| SAEx 14.6 | 4 | 4.8 | 200 | 500 | 175 | 60 | F14 | G1/2 | 58 | 400 | 11 : 1 | 67 |
| | 5.6 | 6.7 | | | | | | | | | 8 : 1 | |
| | 8 | 9.6 | | 400 | | 30 | | | | | 11 : 1 | |
| | 11 | 13 | | | | | | | | | 8 : 1 | |
| | 16 | 19 | | | 150 | | | | | | 11 : 1 | 70 |
| | 22 | 26 | | | | | | | | | 8 : 1 | |

1) The tripping torque is adjustable for directions OPEN and CLOSE within the indicated torque range.

2) Maximum permissible torque for 15 min. running time.

3) For actuators equipped 1-phase AC motors with integral permanent split capacitors (motor type VE/AE), an off-time (reversing prevention time) of minimum 2.5 seconds is required prior to starting in opposite direction.
4) Indicated flange sizes apply for output drive types A and B1. Refer to separate dimension sheets for further output drive types.
5) Indicated weight includes AUMA NORM multi-turn actuator with 1-phase AC motor, electrical connection in standard version, output drive type B1 and handwheel.

| **Features and functions** | | |
|---|---|---|
| Explosion protection | Standard: | II 2G Ex db eb IIB T4 or T3 Gb<br>II 2G Ex h IIB T4 or T3 Gb<br>II 2D Ex tb IIIC T130°C or T190°C Db |
| | Options: | II 2G Ex db IIB T4 or T3 Gb<br>II 2G Ex h IIB T4 or T3 Gb |
| Product certificates | DEKRA 11ATEX0008 X | |
| Type of duty | Standard: | Short-time duty S2 - 15 min, classes A and B according to EN ISO 22153 |
| | For nominal voltage and +40 °C ambient temperature and at run torque load. | |
| Motors | 1-phase AC motor with integral permanent split capacitor (PSC), type IM B9 according to IEC 60034-7, IC410 cooling procedure according to IEC 60034-6<br>1-phase AC motor with integral starting capacitor and solid state switch (CSIR), type IM B9 according to IEC 60034-7, IC410 cooling procedure according to IEC 60034-6<br>Motor type depending on actuator type/output speed. Refer to Electrical data SAEx 07.2 – SAEx 14.6 with 1-phase AC motors. | |
| Mains voltage, mains frequency | Standard voltages:<br>Refer to table: 1-phase AC standard voltages [▶ 3]<br>Further voltages on request<br>Permissible variation of mains voltage: ±10 %<br>Permissible variation of mains frequency: ±5 % | |
| Overvoltage category | Category III according to IEC 60364-4-44 | |
| Insulation class | F, tropicalized | |
| Motor protection | Standard: | PTC thermistors (according to DIN 44082)<br>PTC thermistors additionally require a suitable tripping device in the actuator controls |
| | Option: | Thermoswitches (NC)<br>According to EN 60079-14, a thermal overcurrent protection device (e.g. motor protection switch) must be installed for explosion-proof actuators in addition to the thermoswitches. |
| Self-locking | Self-locking: Output speeds up to 90 rpm (50 Hz), 108 rpm (60 Hz)<br>NOT self-locking: Output speeds from 125 rpm (50 Hz), 150 rpm (60 Hz)<br>Multi-turn actuators are self-locking if the valve position cannot be changed from standstill while torque acts upon the output drive. | |
| Motor heater (option) | Voltages: | 110 – 120 V AC, 220 – 240 V AC |
| | Power 12.5 W | |
| Manual operation | Manual drive for setting and emergency operation, handwheel does not rotate during electrical operation. | |
| | Options: | Handwheel lockable<br>Handwheel stem extension<br>Power tool for emergency operation with square 30 mm or 50 mm |
| Indication for manual operation (option) | Indication whether manual operation is active/not active via single switch (1 change-over contact) | |
| Electrical connection | Standard: | AUMA Ex plug/socket connector (KT); screw-type motor terminals;control terminals in spring clamp terminal technology |
| | Option: | AUMA Ex plug/socket connector with terminal blocks (KES) |
| Threads for cable entries | Standard: | Metric threads |
| | Option: | Pg threads, NPT threads, G threads |
| Wiring diagram | TPA01R2AA-101-000, 1-phase AC motor with permanent split capacitor 100 – 240 V AC (basic version in combination with PTC thermistors)<br>TPA01R1AA-101-000, 1-phase AC motor with permanent split capacitor 00 – 240 V AC (basic version in combination with thermoswitches)<br>TPA02R2AA-101-000, 1-phase AC motor with permanent split capacitor and solid state switch 110 – 120 V AC (basic version in combination with PTC thermistors)<br>TPA02R1AA-101-000, 1-phase AC motor with permanent split capacitor and solid state switch 110 – 120 V AC (basic version in combination with thermoswitches)<br>TPA03R2AA-101-000, 1-phase AC motor with permanent split capacitor and solid state switch 220 – 240 V AC (basic version in combination with PTC thermistors)<br>TPA03R1AA-101-000, 1-phase AC motor with permanent split capacitor and solid state switch 220 – 240 V AC (basic version in combination with thermoswitches)<br>Depending on motor type/output speed. Refer to Electrical data SAEx 07.2 – SAEx 14.6 with 1-phase AC motors. | |

| Features and functions | | |
|---|---|---|
| Valve attachment | Standard: | B1 in accordance with ISO 5210 |
| | Options: | A, B2, B3, B4, C, D according to ISO 5210<br>A, B, D, E according to DIN 3210<br>C according to DIN 3338 |
| | Special valve attachments: AF, AK, AG, B3D, ED, DD, IB1, IB3<br>A prepared for permanent lubrication of stem | |

*Table 1:* 1-phase AC standard voltages

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

| Electromechanical control unit | | |
|---|---|---|
| Limit switching | Counter gear mechanism for end positions OPEN and CLOSED<br>Turns per stroke: 2 to 500 (standard) or 2 to 5,000 (option) | |
| | Standard: | Single switch (1 NC and 1 NO) for each end position, not galvanically isolated |
| | Options: | Tandem switch (2 NC and 2 NO) for each end position, switch galvanically isolated<br>Triple switch (3 NC and 3 NO) for each end position, switch galvanically isolated<br>Intermediate position switches (DUO limit switching), adjustable for each direction of operation |
| Torque switching | Torque switching adjustable for directions OPEN and CLOSE | |
| | Standard: | Single switch (1 NC and 1 NO) for each direction, not galvanically isolated |
| | Option: | Tandem switch (2 NC and 2 NO) for each direction, switch galvanically isolated |
| Switch contact materials | Standard: | Silver (Ag) |
| | Option: | Gold (Au), recommended for low voltage actuator controls |
| Position feedback signal, analogue (options) | Potentiometer or 0/4 – 20mA (electronic position transmitter) | |
| Mechanical position indicator (option) | Continuous indication, adjustable indicator disc with symbols OPEN and CLOSED | |
| Running indication | Blinker transmitter | |
| Heater in switch compartment | Standard: | Self-regulating PTC heater, 5 – 20 W, 110 – 250 V AC/DC |
| | Options: | 24 – 48 V AC/DC |
| | A resistance type heater of 5 W, 24 V AC is installed in the actuator in combination with AMExC or ACExC actuator controls. | |

| Electronic control unit (option, only in combination with ACExC actuator controls) | |
|---|---|
| Non-intrusive settings | Magnetic limit and torque transmitter (MWG)<br>Turns per stroke: 2 to 500 (standard) or 10 to 5,000 (option) |
| Position feedback signal | Via actuator controls |
| Torque feedback signal | Via actuator controls |
| Mechanical position indicator (option) | Continuous self-adjusting indication with symbols OPEN and CLOSED |
| Running indication | Blinking signal via actuator controls |
| Heater in switch compartment | Resistance type heater with 5 W, 24 V AC |

| 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 | |
| Ambient temperature | Standard: | –30 °C to +40 °C/+60 °C |
| | Options: | –40 °C to +40 °C/+60 °C<br>–50 °C to +40 °C/+60 °C |
| Humidity | Up to 100 % relative humidity across the entire permissible temperature range | |
| Enclosure protection in accordance with IEC 60529 | IP68 with AUMA 1-phase AC motors of types AE..., VE..., AC..., VC...<br>Terminal compartment additionally sealed against interior of actuator (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 | |

| | | |
|---|---|---|
| **Service conditions** | | |
| Pollution degree according to IEC 60664-1 | Pollution degree 4 (when closed), pollution degree 2 (internal) | |
| Corrosion protection | Standard: | KS: Suitable for use in areas with high salinity, almost permanent condensation, and high pollution. |
| | Option: | KX: Suitable for use in areas with extremely high salinity, permanent condensation, and high pollution. |
| Coating | Double layer powder coating | |
| Coating | Double layer powder coating | |
| Colour | Standard: | AUMA silver-grey (similar to RAL 7037) |
| | Option: | Available colours on request |
| Lifetime | AUMA multi-turn actuators meet or exceed the lifetime requirements of EN ISO 22153. Detailed information can be provided on request. | |
| Sound pressure level | < 72 dB (A) | |
| **Further information** | | |
| 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<br>Electrical data SAEx 07.2 – SAEx 14.6 | |