

Actuator controls AUMA MATIC AM 01.1/AM 02.1 for controlling multi-turn actuators of the SA/SAR type range and part-turn actuators of the SG/SGR type range for version with Modbus interface.

Features and functions

| Voltage supply | Standard voltages: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|------------------------------|-----|-----|------------------------------|------------------------------|-----|-----|------|-----|-----|------------------------------|------------------------------|-------------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | <table border="1"> <thead> <tr> <th colspan="11">3-ph AC voltages/frequencies</th> <th colspan="3">1-ph AC voltages/frequencies</th> </tr> </thead> <tbody> <tr> <td>Volt</td> <td>220</td> <td>230</td> <td>240</td> <td>380</td> <td>400</td> <td>415</td> <td>440</td> <td>460</td> <td>480</td> <td>500</td> <td>Volt</td> <td>110,115,120</td> <td>220,230,240</td> </tr> <tr> <td>Hz</td> <td>50</td> <td>50</td> <td>50</td> <td>50</td> <td>50</td> <td>50</td> <td>60</td> <td>60</td> <td>60</td> <td>50</td> <td>Hz</td> <td>60</td> <td>50</td> </tr> </tbody> </table> | 3-ph AC voltages/frequencies | | | | | | | | | | | 1-ph AC voltages/frequencies | | | Volt | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 460 | 480 | 500 | Volt | 110,115,120 | 220,230,240 | Hz | 50 | 50 | 50 | 50 | 50 | 50 | 60 | 60 | 60 | 50 | Hz | 60 | 50 |
| | 3-ph AC voltages/frequencies | | | | | | | | | | | 1-ph AC voltages/frequencies | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Volt | 220 | 230 | 240 | 380 | 400 | 415 | 440 | 460 | 480 | 500 | Volt | 110,115,120 | 220,230,240 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hz | 50 | 50 | 50 | 50 | 50 | 50 | 60 | 60 | 60 | 50 | Hz | 60 | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Special voltages: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th colspan="5">3-ph AC voltages/frequencies</th> <th colspan="3">1-ph AC voltages/frequencies</th> </tr> </thead> <tbody> <tr> <td>Volt</td> <td>525</td> <td>575</td> <td>660</td> <td>690</td> <td>Volt</td> <td colspan="2">208</td> </tr> <tr> <td>Hz</td> <td>50</td> <td>50</td> <td>50</td> <td>50</td> <td>Hz</td> <td colspan="2">60</td> </tr> </tbody> </table> | 3-ph AC voltages/frequencies | | | | | 1-ph AC voltages/frequencies | | | Volt | 525 | 575 | 660 | 690 | Volt | 208 | | Hz | 50 | 50 | 50 | 50 | Hz | 60 | | | | | | | | | | | | | | | | | | | | |
| 3-ph AC voltages/frequencies | | | | | 1-ph AC voltages/frequencies | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Volt | 525 | 575 | 660 | 690 | Volt | 208 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hz | 50 | 50 | 50 | 50 | Hz | 60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Permissible variation of the nominal voltage: $\pm 10\%$ Permissible variation of the mains frequency: $\pm 5\%$ Current consumption of the controls depending on the mains voltage: 100 to 120 V AC = max. 575 mA 208 to 240 V AC = max. 275 mA 380 to 690 V AC = max. 160 mA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| External supply of the electronics (option) | 24 V DC + 20 % / - 15 %, Current consumption: basic version approx. 200 mA, with options up to 500 mA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Switchgear | Standard: Reversing contactors ¹⁾ (mechanically and electrically interlocked) for motor power up to 1.5 kW, nominal motor current up to 9 A (OPEN - CLOSE duty) or 5.2 A (modulating duty) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Options: Reversing contactors ¹⁾ (mechanically and electrically interlocked) for motor power up to 7.5 kW, nominal motor current up to 20 A (OPEN - CLOSE duty) or 18 A (modulating duty) Thyristor unit (recommended for modulating actuators) for motor power up to 1.5 kW, 500 V AC with internal fuses for motor power up to 3.0 kW, 500 V AC with internal fuses for motor power up to 5.5 kW, 500 V AC external fuses required | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Control and output signals | Via Modbus interface | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Modbus interfaces with additional inputs (option) | Modbus interface with 4 free 24 V DC inputs and 2 free 0/4 – 20 mA inputs. Signal transmission via fieldbus interface | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Local controls | Standard: Selector switch LOCAL - OFF - REMOTE (lockable in all three positions) Push buttons OPEN - STOP - CLOSE 3 indication lights: End position CLOSED (yellow), collective fault signal (red), end position OPEN (green) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Option: Protection cover, lockable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Functions | Standard: Seating programmable Limit or torque seating for end position CLOSED Overload protection against excessive torques over the whole travel Phase failure monitoring with automatic phase correction Push-to-run operation or self-retaining in LOCAL Positioner ²⁾ : Nominal position value via Modbus interface Adjustable behaviour on loss of signal Adjustable sensitivity (dead band) and pause time | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Motor protection evaluation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Motor protection evaluation | Standard: Monitoring of the motor temperature in combination with thermostats in the actuator motor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Options: Additional thermal overload relay in the controls PTC tripping device in combination with PTC thermistors in the actuator motor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

1) 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.
2) Requires position transmitter in actuator.

We reserve the right to alter data according to improvements made. Previous documents become invalid with the issue of this document.

| | | | |
|---|--|---|--|
| Electrical connection | Standard: AUMA plug/socket connector with screw type connection: Threads for cable glands: M-threads: 1 x M20 x 1.5; 2 x M25 x 1.5 Pg-threads: 1 x Pg13.5; 2 x Pg21 NPT-threads: 1 x 1/2" NPT; 2 x 3/4" NPT Special threads, other than standard mentioned above, possible Gold-plated control plug (pins and sockets) Parking frame for wall mounting of the disconnected plug Protection cover for plug compartment (when plug is removed) | | |
| Overvoltage protection (option) | Protection of the actuator and control electronics against overvoltages on the fieldbus cables of up to 4 kV | | |
| Wiring diagram (basic version) | MSP 1B1-00-7-F18E1 KMS TP102/001 | | |
| Settings/programming of the Modbus interface | | | |
| Setting of the Modbus interface | Baud rate, parity, and Modbus address are set via the Modbus subassembly of the AUMA MATIC | | |
| Commands and signals of the Modbus interface | | | |
| Process representation output (command signals) | OPEN, STOP, CLOSE, nominal position value ²⁾ | | |
| Process representation input (feedback signals) | End position OPEN, CLOSED Actual position value ²⁾ Selector switch in position LOCAL/REMOTE Running indication ²⁾ (directional) Torque switch OPEN, CLOSED Limit switch OPEN, CLOSED Manual operation by handwheel ²⁾ or local controls | | |
| Process representation input (fault signals) | Motor protection tripped Torque switch tripped in mid-travel One phase missing | | |
| Behaviour on loss of communication | The behaviour of the actuator is programmable: - Move to end position OPEN or CLOSED - Move to any intermediate position ²⁾ | | |
| General data Modbus | | | |
| Communication protocol | Modbus RTU | | |
| Network topology | Linear (bus) structure. Active bus termination at both ends. Coupling and uncoupling of devices during operation without affecting other devices is possible. | | |
| Transmission medium | Twisted, screened copper cable according to IEC 61158 | | |
| Modbus interface | EIA-485 (RS485) | | |
| Transmission speed/ cable length | Baud rate (bit/s) | Max. cable length (segment length) without repeater | Possible cable length with repeater (total network cable length) |
| | 300 | 1,200 m | approx. 10 km |
| | 600 | 1,200 m | approx. 10 km |
| | 1,200 | 1,200 m | approx. 10 km |
| | 2,400 | 1,200 m | approx. 10 km |
| | 4,800 | 1,200 m | approx. 10 km |
| | 9,600 | 1,200 m | approx. 10 km |
| | 19,200 | 1,200 m | approx. 10 km |
| | 38,400 | 1,200 m | approx. 10 km |
| Device types | Modbus slave, e.g. devices with digital and/or analogue inputs/outputs such as actuators, sensors | | |
| Number of devices | 32 devices in each segment without repeater, with repeaters expandable to 127 ³⁾ | | |
| Bus access | Polling between master and slaves (query response). | | |

2) Requires position transmitter in actuator.

3) The highest Modbus address which can be set at the AUMA MATIC is 127.

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| Technical data Actuator controls AUMA MATIC | | AM 01.1/AM 02.1 Modbus |
|---|--|---|
| Supported Modbus functions (services) | 01 Read Coil Status 02 Read Input Status 03 Read Holding Registers 04 Read Input Registers 05 Force Single Coil 15 (0FHex) Force Multiple Coils 06 Preset Single Register 16 (10Hex) Preset Multiple Registers 07 Read Exception Status 17 (11Hex) Report Slave ID 08 Diagnostics: 00 00 Loopback 00 10 (0AHex) Clear Counters and Diagnostic Register 00 11 (0BHex) Return Bus Message Count 00 12 (0CHex) Return Bus Communication Error Count 00 13 (0DHex) Return Bus Exception Error Count 00 14 (0EHex) Return Slave Message Count 00 15 (0FHex) Return Slave No Response Count | |
| Service conditions | | |
| Enclosure protection according to EN 60 529 | Standard: | IP 67 (when mounted) |
| | Options: | IP 68 ⁴⁾ DS terminal compartment additionally sealed against interior (double sealed) |
| Corrosion protection | Standard: | KN Suitable for installation in industrial units, in water or power plants with a low pollutant concentration |
| | Options: | KS Suitable for installation in occasionally or permanently aggressive atmosphere with a moderate pollutant concentration (e.g. wastewater treatment plants, chemical industry) |
| | | KX Suitable for installation in extremely aggressive atmosphere with high humidity and high pollutant concentration |
| | | KX-G same as KX, however aluminium-free version (outer parts) |
| Finish coating | Standard: | Two-component iron-mica combination |
| | Option: | Special primer/special finish coat (customer's choice) |
| Colour | Standard: | Grey (DB 702, similar to RAL 9007) |
| | Option: | Other colours than standard colour are possible on request |
| Ambient temperature | Standard: | - 25 °C to + 70 °C |
| | Options: | - 40 °C to + 70 °C, low temperature version - 50 °C to + 70 °C, extreme low temperature version incl. heating system - 60 °C to + 70 °C, extreme low temperature version incl. heating system |
| Vibration resistance ⁵⁾ according to IEC 60 068 | 1 g, from 10 Hz to 200 Hz | |
| Weight | Approx. 7 kg (with AUMA plug/socket connector) | |
| Accessories | | |
| Wall bracket ⁶⁾ | AUMA MATIC mounted separately from the actuator, including plug/socket connector. Connecting cables on request. Recommended for high ambient temperatures, difficult access, or in case of heavy vibrations during service. | |
| Other information | | |
| EU Directives | Electromagnetic Compatibility (EMC): (89/336/EEC) Low Voltage Directive: (73/23/EEC) Machinery Directive: (98/37/EC) | |
| Reference documents | Product description "Actuator controls AUMA MATIC" Dimension sheets Multi-turn actuators/part-turn actuators "with integral controls AUMA MATIC" | |
| <p>4) For version in enclosure protection IP 68, higher corrosion protection KS or KX is strongly recommended.</p> <p>5) Resistant to vibrations during start-up or for failures of the plant. However, a fatigue strength may not be derived from this.</p> <p>6) Cable length between actuator and AUMA MATIC max. 100 m. Not suitable for version with potentiometer in the actuator. Instead of the potentiometer, an RWG has to be used.</p> | | |
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