Technical data Actuator controls AUMATIC

AC 01.2
Profibus DP

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

Features and functions

Power supply, mains frequency

Standard voltages:

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	60	60	50	50	50

Special voltages:

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: ±10 %
Permissible variation of the mains frequency: ±5 %
Option:
Permissible variation of the mains frequency: ±30 %

External supply of the electronics (option)

24 V DC + 20 % / –15 %,
Current consumption: Basic version approx. 250 mA, with options up to 500 mA
The external power supply must have a reinforced insulation against the 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 the controls depending on the 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

The controls are designed for the rated power of the motor, refer to Electrical Data Multi-turn actuators/Part-turn actuators

Switchgear

Standard: Reversing contactors[1] (mechanically and electrically interlocked) for AUMA power class[2] A1

Options: Reversing contactors[1] (mechanically and electrically interlocked) for AUMA power class[2] A2

Thyristor unit for mains voltages up to 500 V AC (recommended for modulating actuators) for AUMA power classes[2] B1, B2 and B3

Control and status signals

Via Profibus DP interface

Profibus DP interface with additional inputs (options)

Profibus DP interface with 4 free 24 V DC inputs (current consumption: approx. 10 mA/input) and 2 free 0/4 – 20 mA inputs. Signal transmission via fieldbus interface

Profibus DP interface with 24 V DC control inputs OPEN - STOP - CLOSE - EMERGENCY (current consumption: approx 10 mA/input) and 0/4 – 20 mA input for position setpoint (positioner). Selection of control mode via 24 V DC input (I/O interface).
Position feedback 0/4 – 20 mA.

Profibus DP interface with 24 V DC control inputs OPEN - STOP - CLOSE - EMERGENCY (current consumption: approx 10 mA/input) and 0/4 – 20 mA input for position setpoint (positioner). Selection of control mode via 24 V DC input(I/O interface).
Position feedback via output contacts, position feedback 0/4 – 20 mA.
6 programmable output contacts:
5 potential-free NO contacts with one common, max. 250 V AC, 1 A (resistive load)
Standard 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)
Standard configuration:
Collective fault signal (torque fault, phase failure, motor protection tripped)

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) Assignment of AUMA power classes, refer electrical data for multi-turn or part-turn actuators.

Profibus DP interface with additional inputs (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) 6 programmable output contacts: 6 potential-free change-over contacts without one common, per output contact max. 250 V AC, 5 A (resistive load)	
	Auxiliary voltage output 24 V DC, max. 100 mA to supply inputs, galvanically isolated from internal voltage supply	
Profibus DP-V1 (option)	Access to parameters, the electronic name plate and operating and diagnostic data with acyclic write/read services	
Profibus DP-V2 (Option)	Redundancy AUMATIC is equipped with a redundant Profibus DP interface Time stamp Time synchronisation between AUMATIC and Profibus master with subsequent time stamp of the most important events such as malfunctions, end position and torque signals issued by the AUMATIC	
Local controls	Standard:	Selector switch LOCAL - OFF - REMOTE (lockable in all three positions)
		Push buttons OPEN, STOP, CLOSE, RESET Local Stop Actuator can be stopped via local controls if selector switch is in position REMOTE. Not activated as factory setting.
	6 indication lights:	End position and running indication CLOSED (yellow), torque fault CLOSED (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 5 indication lights: End position CLOSED (green), torque fault CLOSE (blue), torque fault OPEN (yellow), motor protection tripped (white), end position OPEN (red)
Bluetooth communication interface	Bluetooth class II chip, version 2.0 with a range of up to 10 m in industrial environment. Supports the Bluetooth profile SPP (Serial Port Profile). Parameterization program: AUMA ToolSuite, commissioning and diagnostic tool for Windows based PCs, PDAs and smartphones	
Application functions	Standard:	Switch-off mode adjustable limit or torque seating for end position OPEN and end position CLOSED
		Torque by-pass, adjustable to up to 5 seconds (no torque monitoring during this time)
		Timer Start and end stepping mode as well as ON and OFF times (1 to 1,800 sec.) can be set individually for directions OPEN and CLOSE)
		8 freely selectable intermediate positions between 0 und 100 % Reaction and signal behaviour can be programmed
		Positioner: Position setpoint via Profibus DP interface Programmable behaviour on loss of signal Automatic adaptation of the dead band (adaptive behaviour selectable) Split Range operation Changing from OPEN - CLOSE to modulating duty via Profibus DP
Safety functions	Option:	EMERGENCY behaviour programmable Digital input low active Reaction selectable: Stop, operation to end position CLOSED, operation to end position OPEN, operation to intermediate position
		Torque monitoring and thermal protection[3)] can be by-passed during EMERGENCY operation
		Enabling local controls via Profibus interface. Thus, the actuator operation can be enabled or disabled via push buttons on the local controls.
		EMERGENCY stop push button (latching) interrupts electrical operation, irrespective of the selector switch position
Monitoring functions	Standard:	Valve overload protection (adjustable), results in switching off and generates a fault signal
		Monitoring the heater in actuator, generates an alarm signal
		Monitoring the permissible on time and number of starts (adjustable) generates an alarm signal
		Operation time monitoring (adjustable) results in switching off and generates an alarm signal
		Phase failure monitoring, results in switching off and generates a fault signal
		Automatic correction of the direction of rotation upon wrong phase sequence (3-ph AC current)

3) Not possible in combination with PTC tripping device

Diagnostic functions	Electronic device ID with order and product data	
	Logging of operating data: Respectively, a resettable counter and a lifetime counter 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 entries for setting history, operation history and fault history: Status signals according to NAMUR recommendation NE 107: "Failure", "Function check", "Out of specification", "Maintenance required"	
	Torque characteristics 3 torque characteristics (torque - operating time characteristics), can be saved separately for open and close directions. Current and saved torque characteristics can be indicated on the display.	
Motor protection evaluation	Standard:	Monitoring of the motor temperature in combination with thermoswitches in the actuator motor
	Options:	Thermal overload relay in the controls in combination with thermoswitches within the actuator
		PTC tripping device in combination with PTC thermistors in the actuator motor
Overvoltage protection (option)	Protection of actuator and controls electronics against overvoltages on fieldbus cables up to 4 kV	
Electrical connection	Standard:	AUMA plug/socket connector with screw-type connection:
	Options:	Terminals or crimp connection Gold-plated control plug (pins and sockets)
Threads for cable entries	Standard:	Metric threads
	Options:	Pg-threads, NPT-threads, G-threads
Wiring diagram (basic version)	TPCAA000-1A1-A000 TPA00R1AA-0A1-000	
Further options for Non-intrusive version with MWG in the actuator		
Setting the limit and torque switching via local controls		
Torque feedback signal	Galvanically isolated analogue output E6 = 0/4 – 20 mA (load max. 500 Ω)	
Settings/programming of the Profibus DP interface		
Setting the baud rate	Automatic baud rate recognition	
Setting the Profibus DP interface	Profibus DP address setting is made via the display of the AUMATIC	
Configurable process representation via GSD file	For an optimal adaptation to the process control system, the process representation can be freely programmed.	
Commands and signals of the Profibus DP interface		
Process representation output (command signals)	OPEN, STOP, CLOSE, position setpoint, RESET	
Process representation input (feedback signals)	End position OPEN, CLOSED Actual position value Actual torque value[4)] Selector switch in position LOCAL/REMOTE Running indication (directional) Torque switch OPEN, CLOSED Limit switch OPEN, CLOSED Manual operation by handwheel or local controls Analogue (2) and digital (6) customer inputs	
Process representation input (fault signals)	Motor protection tripped Torque switch tripped in mid-travel Loss of one phase Loss of the analogue customer inputs	
Behaviour on loss of communication	The behaviour of the actuator is programmable: - Stop in current position - Travel to end position OPEN or CLOSED - Travel to any intermediate position	
General data Profibus DP		
Communication protocol	Profibus DP according to IEC 61158 and IEC 61784	
Network topology	Linear (bus) structure. With repeaters tree structures can also be implemented. Coupling and uncoupling of devices during operation without affecting other devices is possible.	
Transmission medium	Twisted, screened copper cable according to IEC 61158	
Profibus DP interface	EIA-485 (RS485)	

4) Requires magnetic limit and torque transmitter (MWG) in actuator

Transmission rate/ cable length	<table><tr><th>Baud rate (kbit/s)</th><th>Max. cable length (segment length) without repeater</th><th>Possible cable length with repeater (total network cable length)</th></tr><tr><td>9.6 – 93.75</td><td>1,200 m</td><td>approx. 10 km</td></tr><tr><td>187.5</td><td>1,000 m</td><td>approx. 10 km</td></tr><tr><td>500</td><td>400 m</td><td>approx. 4 km</td></tr><tr><td>1,500</td><td>200 m</td><td>approx. 2 km</td></tr></table>
Device types	DP master class 1, e.g. central controllers such as PLC, PC, … DP master class 2, e.g. programming/configuration tools DP slave, e.g. devices with digital and/or analogue inputs/outputs such as actuators, sensors
Number of devices	32 devices without repeater, with repeater expandable to 126
Bus access	Token-passing between the masters and polling for slaves. Mono-master or multi-master systems are possible.
Supported Profibus DP functions	Cyclic data exchange, sync mode, freeze mode, fail-safe mode
Service conditions	
Use	Indoor and outdoor use permissible
Mounting position	Any position
Installation altitude	Standard: ≤ 2,000 m above sea level Option: > 2,000 m above sea level, please contact the factory
Ambient temperature	Standard: –25 °C to +70 °C Options: –40 °C to+70 °C, low temperature version, incl. heating system –50 °C to+70 °C, extreme low temperature version, incl. heating system Low temperature versions incl. heating system for connecting to external voltage supply 230 V AC or 115 V AC.
Humidity	Up to 100 % relative humidity across the total permissible temperature range
Enclosure protection according to EN 60529	Standard: IP 68 with AUMA 3-ph AC motor For special motors variant enclosure protection: refer to name plate Option: DS terminal compartment additionally sealed against interior (double sealed) According to AUMA definition, enclosure protection IP 68 meets the following requirements: Depth of water: maximum 8 m head of water Duration of flooding: maximal 96 hours Up to 10 operations during flooding Modulating duty is not possible during flooding
Pollution degree	Within actuator controls: pollution degree 2 Outside actuator controls:(in closed conditions): pollution degree 4
Vibration resistance according to IEC 60068-2-6	1 g, for 10 to 200 Hz Resistant to vibrations 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 installation in industrial units, in water or power plants with a low pollutant concentration as well as for installation in occasionally or permanently aggressive atmosphere with a moderate pollutant concentration (e.g. in wastewater treatment plants, chemical industry) Options: KX Suitable for installation in extremely aggressive atmosphere with high humidity and high pollutant concentration
Finish coating	Standard: Two-component iron mica combination Powder coating
Colour	Standard: AUMA silver-grey (similar to RAL 7037) Option: Other colours are possible on request
Accessories	
Wall bracket[5)]	AUMATIC 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 vibration during service.
Further information	
Weight	Approx. 7 kg (with AUMA plug/socket connector)
EU Directives	Electromagnetic Compatibility (EMC): (2004/108/CE) Low Voltage Directive: (2006/95/CE) Machinery Directive: (2006/42/CE)
Reference documents	Product description “Actuator controls AUMATIC” Dimensions “Multi-turn actuators/part-turn actuators with integral controls AUMATIC”

5) Cable length between actuator and AUMATIC max. 100 m. Not suitable for version with potentiometer in the actuator. Instead of the potentiometer, an RWG has to be used. Cable length for Non-intrusive version with MWG in the actuator max. 100 m. Requires separate data cable for MWG.