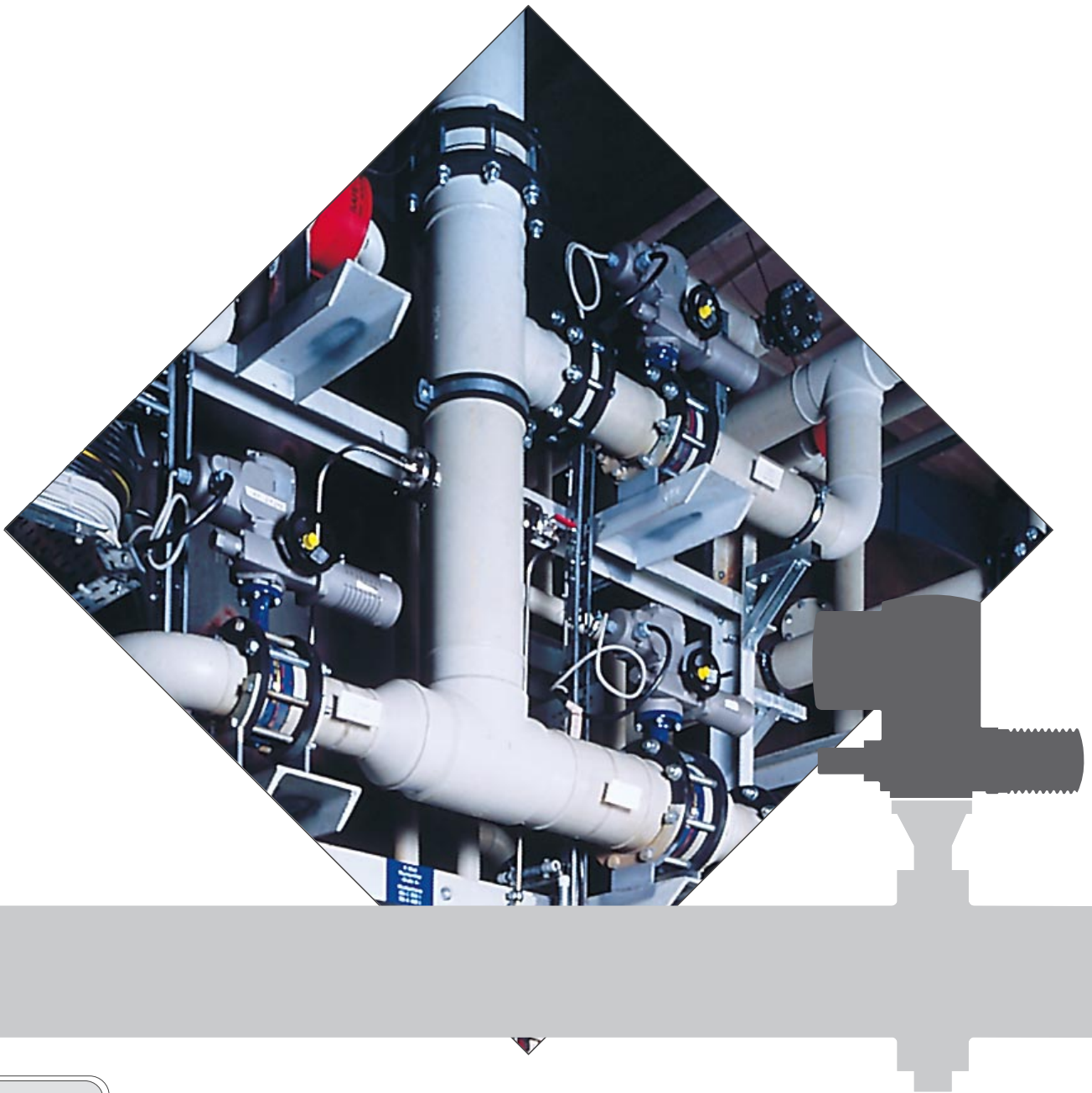


auma®

Electric part-turn actuators

SG 05.1 - SG 12.1
SGEx 05 - SGEx 12



Certificate Registration No.
12 100 4269

Product-description

Part-turn valves find applications in many industries worldwide to control the flow in pipelines. Electric part-turn actuators are gaining more and more importance in the field of automation. AUMA has further developed the reliable part-turn actuators of the SG range to meet the increasing requirements for valve automation.

AUMA is a leading manufacturer of electric actuators. More than 30 years' experience in conjunction with the innovative spirit of our engineers are the sound basis for constant improvements and further developments.

AUMA offers a wide range of actuators which fulfills all usual requirements of valve automation.

Multi-turn actuators from 10 Nm up to 32 000 Nm, part-turn actuators from 25 Nm up to 250 000 Nm or linear thrust units from 3,8 kN up to 217 kN. All kinds of valves can be operated by rotation, swivel and linear movements.

Sales support and after sales service are provided worldwide by regional offices, service centers, AUMA subsidiaries and representatives. This ensures that experienced sales engineers and qualified service technicians are close to the customers. They are prepared for answering enquiries, providing product training, executing orders or giving after-sales service.

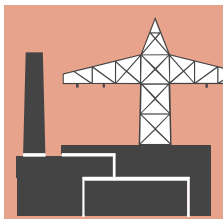
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We reserve the right to alter data according to improvements made.
Figures and diagrams are not binding.

Applications

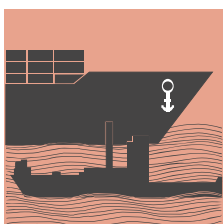
Applications

AUMA part-turn actuators are designed for the operation of valves, which require a swivel movement of less than 360°, e.g. butterfly or ball valves.

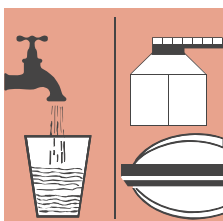


Energy

Power plants, Desulphurization units, District heating, Pipelines

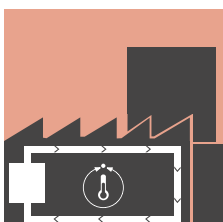


Ship building industry



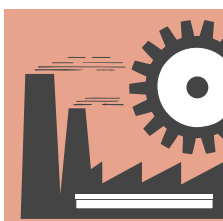
Water industry

Water works, Sewage treatment plants
Water pipelines



Air conditioning

Air conditioning, Ventilation,
Environment technology



Others

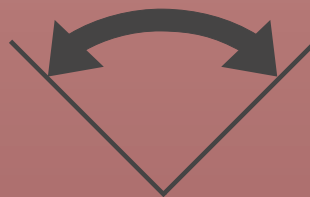
Chemical industry, Sugar industry, Steel works,
Cement plants, Food industry



auma norm



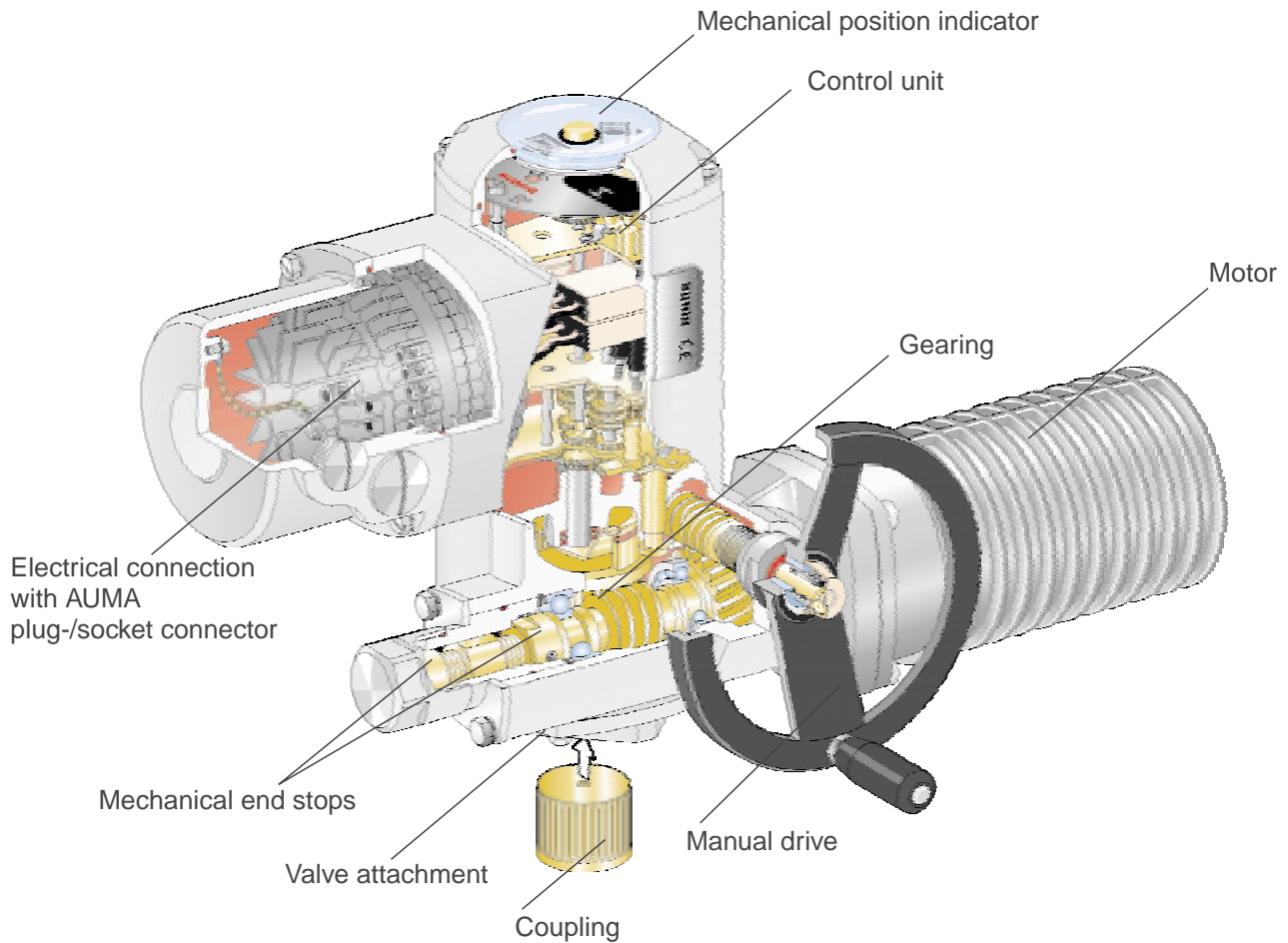
auma matic



Definition of part-turn actuators according to ISO 5211

An actuator which transmits a torque to the valve over less than one revolution. It need not to be capable of withstanding thrust.

auma Part-turn actuators SG

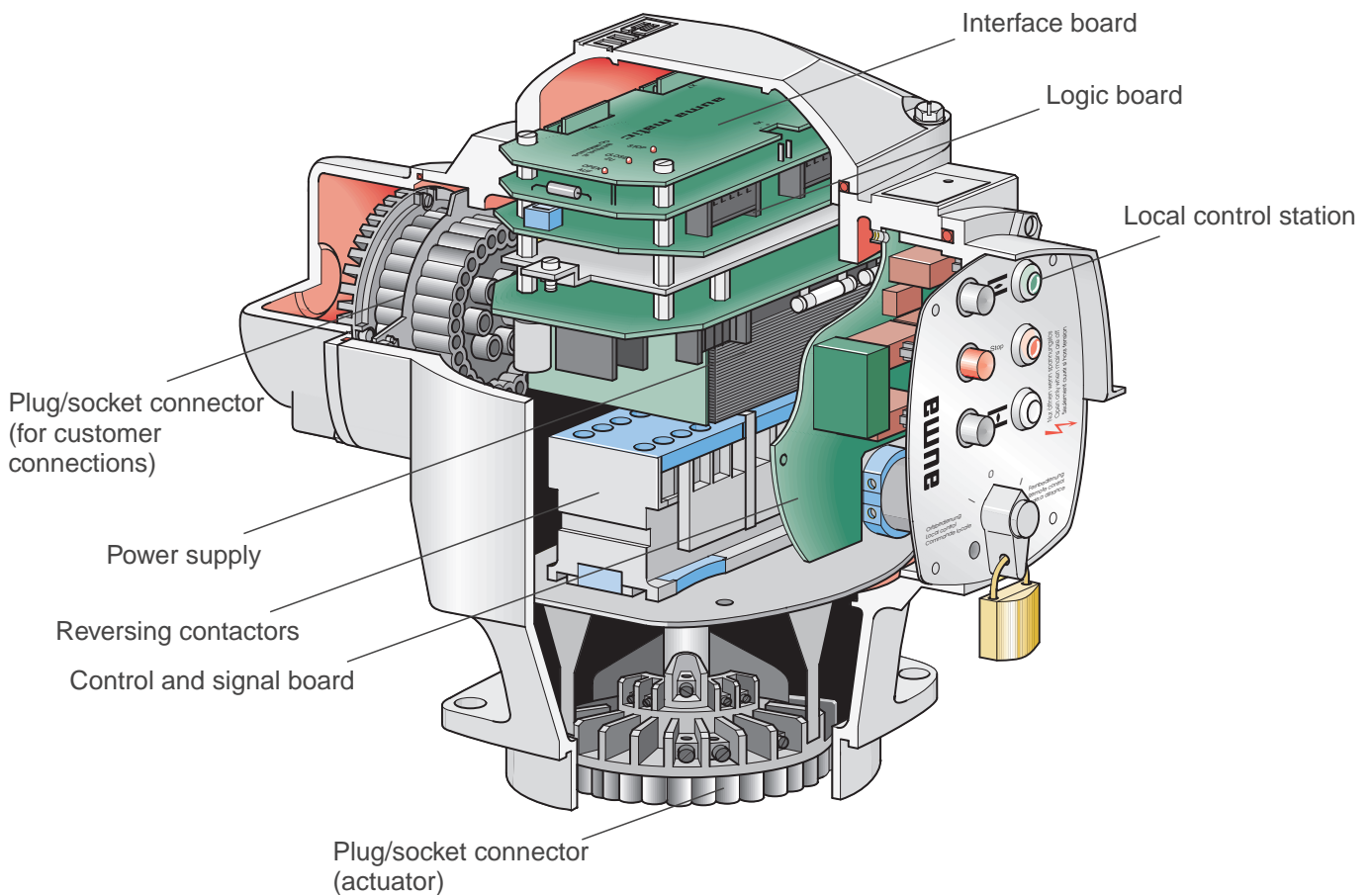


Reliable technology for long-term operation

AUMA part-turn actuators SG distinguish themselves by various design characteristics which have proven their reliability for many years.

- 3-phase AC motors with high starting torque or
- 1-phase AC motors for adjustable operating times
- End stops for the exact limitation of the swing angle
- operation possible in any mounting position
- simple mounting to the valve due to separate coupling
- valve mounting flange according to ISO 5211
- high enclosure protection
- high-quality corrosion protection
- explosion-proof version (optional)

Actuator controls auma matic



Actuator controls AUMA Matic: the optimum interface to the Distributed Control System (DCS)

On request the part-turn actuators SG can be supplied with actuator controls AUMA Matic. AUMA Matic enables cost savings and facilitates planning, installation, commissioning and operation.

Features

- integrated motor controls
- phase monitoring to prevent incorrect direction of rotation (for part-turn actuators with 3-phase AC motors)
- no inadmissible delay time (< 50 ms)
- direct control via PLC possible
- field bus connections: PROFIBUS-DP, PROFIBUS-FMS, INTERBUS-S or MODBUS-RTU (options)
- Electrical connection via AUMA plug/ socket connector
- easy mounting to the actuator by plug/ socket connector (re-positioning 4 x 90° possible)
- integrated local controls (re-positioning 4 x 90° possible)
- lockable selector switch for LOCAL/OFF/REMOTE
- can be mounted on a wall bracket
- easy retrofitting¹⁾

1) Explosion-proof part-turn actuators SGEx cannot be retrofitted with the actuator controls AUMA Matic.

auma Part-turn actuators SG

Function

AUMA part-turn actuators serve to operate part-turn valves. The motor revolutions are reduced and transformed into a swivel movement via a planetary and worm gearing.

AUMA part-turn actuators SG can close and open the valve either in limit or torque seating. For this purpose two independent measuring systems are integrated into the control unit. Limit and torque seating require different logic connections of the actuator signals, which must be realized in the controls.

When using the actuator controls AUMA MATIC the desired seating method can be set by a switch.

Limit seating in opening and closing direction

The limit switches are adjusted so that the actuator switches off at the desired end positions.

Torque seating in closing direction

Certain valve types are torque-seated. In this case the torque switching is set to the desired tripping torque. The limit switching is set so that the switch trips just short of the end position. By utilizing both signals in the controls the signal 'end position reached' can be transmitted to the control room.

Torque switching as overload protection

The torque switching acts as overload protection for the driven valve in both directions over the whole travel. The actuator is switched-off if the torque switching is tripped before reaching an end position, i.e. due to tightness of the valve or a trapped object. In this case the signalisation of the limit switching is missing, therefore a fault signal is indicated at the control room.

Ambient conditions / Enclosure protection

Ambient temperature

- Types SG:
 - 25 °C to + 70 °C¹⁾ (standard)
 - 40 °C to + 60 °C (low temp.)
 - 0 °C to +120 °C²⁾ (high temp.)
- Types SGEx (explosion proof):
 - 20 °C³⁾ to + 40 °C (standard)
 - 40 °C³⁾ to + 40 °C (low temp.)

Type of duty according to VDE 0530 / IEC 34-1

AUMA part-turn actuators SG are suitable for short time duty S2 - 15 min.

- 1) Version AUMA NORM with 3-phase AC motor up to + 80 °C.
- 2) Only with 3-phase AC motor possible
- 3) The PTB (Physikalisch Technische Bundesanstalt, a European test authority) certificate of conformity is valid for the temperature range from – 20 °C up to + 40 °C. The part-turn actuators are designed and manufactured to guarantee operation even at ambient temperatures below – 20 °C.

IP 67

AUMA part-turn actuators conform to enclosure protection IP 67 according to EN 60 529. IP 67 means protection against immersion up to 1 m head of water for max. 30 minutes.

P 68 (option)

AUMA part-turn actuators are available with improved enclosure protection IP 68 according to EN 60 529. IP 68 means protection against submersion up to 6 m head of water for max. 72 hours. During submersion up to 10 operations are permissible.

In order to guarantee enclosure IP 68, pressure tight cable glands have to be used. They are not part of the standard supply, but can be provided by AUMA, if ordered.

Explosion protection

AUMA part-turn actuators SG are also available in an explosion-proof version SGEx. They conform to the European Standards EN 50 014, 50 018, 50 019 and 50 020.

The PTB (Physikalisch-Technische Bundesanstalt) as national test authority certifies the conformity of the part-turn actuators with the above mentioned standards.

AUMA part-turn actuators SGEx 05 - SGEx 12 have the explosion-proof markings EEx ed IIC T4. If an electronic position transmitter RWG 5020 Ex is installed the explosion-proof marking becomes EEx ed ib IIC T4 (intrinsically safe).

Corrosion protection / Paint finish

KN (Standard)

The standard AUMA corrosion protection KN is a high quality coating, suitable for outdoor installations even in a moderately aggressive atmosphere.

After thoroughly de-greasing, sand-blasting and cleaning, a high-covering synthetic resin based primer is applied.

Aluminium parts, e.g. covers, are electro-dip coated.

The entire actuator is coated with a two-component paint based on polyurethane with micaceous iron oxide.

The outside bolts at the plug cover and switch compartment cover are of stainless steel.

The standard colour of the finish coating is silver-grey (DB 701, similar to RAL 9007). The total film thickness for KN is at least 60 µm.

KS

AUMA recommends this corrosion protection class for installing units in aggressive atmospheres, e.g. maritime climate or aggressive chemical substances (e.g. sewage works, chemical plants).

In addition to the KN corrosion protection measures, all cast iron parts receive a metallic surface protection. Before finish coating an intermediate coat is applied. The total film thickness for KS is at least 140 µm.

KX

AUMA recommends this corrosion protection class for installing units in extremely aggressive atmospheres e.g. in cooling towers.

For KX all cast iron parts are provided with a metallic surface protection. Before finish coating the actuator, two intermediate coatings are applied. The total film thickness for KX is at least 225 µm.

EU-Directives

According to the **Machinery Directive** part-turn actuators are not complete machines. AUMA's Declaration of Incorporation confirms that during the design stage the Standards mentioned in the Directive were applied.

The **Low Voltage** and **Electromagnetic Compatibility Directives** are to be applied to part-turn actuators. AUMA part-turn actuators fulfill all requirements of these Directives. Therefore, AUMA has Certificates of Conformity available. According to the marking liability the CE mark is stamped on the actuator nameplate.



auma Part-turn actuators SG

Components of part-turn actuators SG

AUMA part-turn actuators are of uniform and modular design for the entire type range (4 sizes).

Gearing

The motor revolutions are transformed into the required swivel movement at the output drive by a planetary and worm gearing. The required operating time is achieved by the proportionate combination of the gear reduction ratios.

End stops

At the end of the worm shaft is a threaded spindle. When the gearing runs in OPEN or CLOSE direction a travelling nut moves towards the corresponding end stop. The swing angle is adjustable between 80° and 110°. On request part-turn actuators can be supplied with another setting range.

The following advantages are the result of this design:

- The end stop load is not transmitted to the gearbox housing but is absorbed by the limit stop spindle.
- The setting of the end stop is only necessary for one end position since the required swing angle was set at the factory. A later change of the swing angle can be easily made.

Motor

Reliable service of the part-turn actuators is guaranteed by specially developed AUMA motors having a high starting torque. This is required to guarantee unseating of fully closed valves.

All motors are braked after switch-off – therefore the overrun of the SG part-turn actuators is extremely low. For standard voltages and frequencies refer to technical data on page 18.

3-phase AC motor

AUMA uses 3-phase AC motors with squirrel cage rotor. The motor is subject to very little wear and tear on account of the small number of mechanical components.

1-phase AC motor

The operating time for part-turn actuators with 1-phase AC motors is adjustable within a wide range. It can easily be set to the specific conditions on site.

Motor protection

The tropicalized winding has insulation class F according to VDE 0530 or IEC 85.

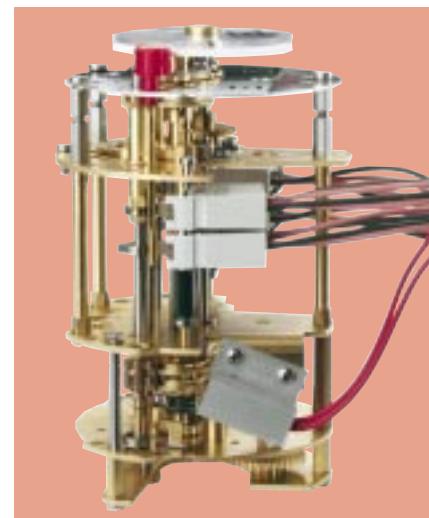
Thermoswitches are provided to protect the motor windings. Integrated into the controls they protect the motor by interrupting the control circuit as soon as a temperature of 140 °C is exceeded.

On request thermistors can be built into the motors.

Manual operation

A handwheel is available at the part-turn actuator for manual operation, e.g. for setting during commissioning. The manual operation acts on the worm shaft due to an over-riding gear arrangement. The handwheel lock must be disengaged for operation. During electric operation the handwheel remains stationary.

Control unit



Limit and torque switching, as well as optional extras for position feedback, are mounted in the control unit. Two independent measuring systems are integrated into the control unit to register the valve travel (valve position) and the demanded output torque. For further information please refer to page 11.

Mechanical position indicator



The exact position of the valve is continuously visible through a sight glass of the mechanical position indicator.

Control unit – Standard equipment

Limit switching



The stroke is limited via electrical limit switches operated by adjustable mechanical counter wheels. The switch point repeatability error is almost zero. The limit switching is not only active during motor operation, it also functions under manual operation, in other words, as long as the control supply is present a signal indicating end position reached will be available even when operating by hand.

Torque switching



The torque switching works on the principle of the sliding worm. The worm for measuring can be axially displaced on the shaft, in proportion to the thrust against the disc springs. This movement is transmitted to the torque switching in the control unit.

The required tripping torque is easily set at the corresponding dial and indicated directly in daNm (≈ 1 mkp) for OPEN and CLOSE direction.

Single switches

For torque- and limit switching high quality microswitches with spring mechanism are used as standard.

Double breaking (SPDT) switching elements are placed in the entirely enclosed housing of high chemical resistance.

Rating of single and tandem switches (Page 12)

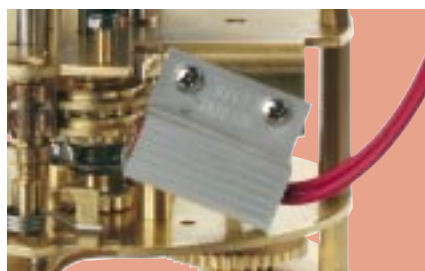
Type of current	Switch rating I_{max}		
	30 V	125 V	250 V
AC (ind. load) $\cos \varphi=0,8$	5 A	5 A	5 A
DC (res. load)	2 A	0,5 A	0,4 A
with gold contacts	min. 5 V, max. 50 V		
current	min. 4 mA, max. 400 mA		

Caution: Connect only one potential to the two circuits of one switch. In case of different potentials tandem switches must be used (refer to page 12).



Technical data	Single switch
Enclosure	IP 66
Operating device	lever
Contact elements	snap action mechanism
Contact material	silver (standard) gold (option), recommended for controls with low voltages
Type of contacts	1 NC und 1 NO
Mechanical life	min. 2×10^6 cycles

Space heater



By using a space heater in the switch compartment, condensation due to high temperature variations can be prevented.

Note: The space heater is rated for continuous duty. Therefore it should preferably always be energized, but at least when the actuator is not operating!

Technical data	Space heater AUMA NORM	Space heater AUMA MATIC
Heating element	self-regulating PTC-component	resistance heating
Voltage range	110 V - 250 V DC/AC 24 V - 48 V DC/AC 380 V - 400 V AC	24 V DC/AC
Power	5 W - 20 W SG 3 W - 15 W SGEx	5 W

auma Part turn actuators SG

Control unit – Optional equipment

DUO-limit switching

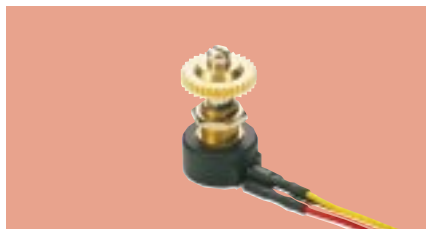


The DUO-limit switching (4GTLS) has two additional counter gear sets and associate switches. These switches can be set to any intermediate position between the end positions. The switch remains tripped from the adjusted tripping point up to the end position.

Position transmitters

The position of the valve can be transmitted as a continuous signal for remote indication.

Precision potentiometer



- Linearity $\leq 1\%$, 0,5 W
- Standard value 0,2 k Ω is suitable for AUMA power supply unit PS 01 and indication instrument (refer to separate data sheet)
- Options:
0,1 k Ω , 0,5 k Ω , 1,0 k Ω or 5,0 k Ω

Precision potentiometer in the tandem version

- Linearity $\leq 1\%$, 0,5 W
- Standard 0,2/0,2 k Ω
- Options: 0,5 / 0,5 k Ω , 1,0 / 1,0 k Ω , 5,0 / 5,0 k Ω or 0,2 / 5,0 k Ω

Tandem switches

Tandem switches (DPDT) are used in applications where different potentials are to be switched. They have two compartments with galvanically separate switches in a common

encapsulated housing. The two switches are operated together. One switch is leading, which should be used for signalisation. For rating refer to table on page 11.



Technical data	Tandem switches
Enclosure	IP 66
Operating device	both switching elements are operated together by one lever
Contact elements	two snap action mechanisms
Contact material	silver (standard) gold (option), recommended for controls with low voltages
Type of contacts	2 NC and 2 NO 1 NC and 1 NO leading
Leakage and sparking distances	according to DIN/VDE 0630

Electronic position transmitter RWG



The output movement is picked up by the position transmitter. The signal is transformed by electronics into a current value. Zero and span of the feedback signal can be easily adjusted by trimmer potentiometers on the electronic board.

Output signal	4 - 20 mA
- 2-wire-system	0/4 - 20 mA
- 3- or 4-wire-system	
Voltage supply	24 V DC $\pm 15\%$ smoothed
Ambient temperature	- 40 °C to + 70 °C

For further information refer to brochure 'Electronic position transmitter'.

Blinker switch

The blinker switch may be used for running indication of the actuator. A 90° swivel movement results in approximately 12 impulses. The contacts are wired to the AUMA plug-/ socket connector.

Rating of blinker switch

Type of current	Switch rating I_{max}		
	30 V	125 V	250 V
AC (ind. load) $\cos \varphi=0,8$	5 A	5 A	5 A
DC (res. load)	2 A	0,5 A	0,4 A



Technical data	Blinker switch
Operating device	lever with roller
Contact elements	snap action mechanism
Contact material	silver (standard) gold (option), recommended for controls with low voltages
Type of contacts	one change-over contact

Actuator controls auma matic

Actuator controls AUMA MATIC



Part-turn actuators SG with integral actuator controls AUMA MATIC are the ideal solution for the automation of valves. The actuators are supplied ready for service. They include complete motor controls and a local control station.

The actuator controls AUMA MATIC provide the following functions:

- processing of binary control commands OPEN, STOP, CLOSE
- processing of the actuator signals, e.g. end position signals or torque switch signals
- Switching of the integrated motor power control (reversing contactors or thyristor unit) according to the control commands or the actuator signals.
- providing the feedback signals for the remote control system

Several protective or monitoring functions are available to increase service safety and to simplify diagnosis in case of a fault:

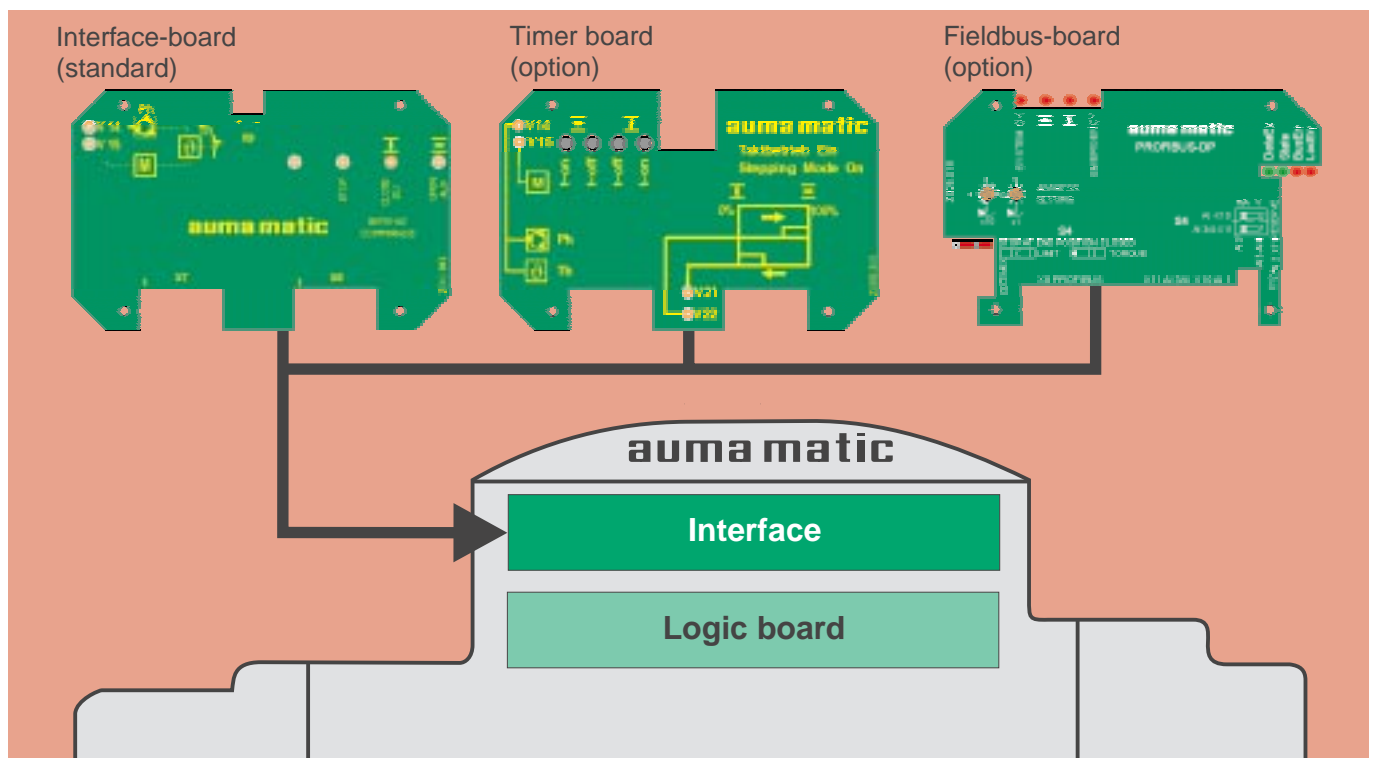
- The actuator is switched off after the motor protection has tripped (in case of overheating)
- The actuator is switched off when the torque switch is tripped in mid-travel
- Monitoring of phase sequence (for actuators with 3-phase AC motor)
- In the event of a phase failure a signal is sent to the remote control system

The actuator controls can either be directly mounted to the actuator, or separately from the actuator on a wall bracket (refer to page 15).

AUMA MATIC interfaces

Several different interfaces are available for AUMA MATIC to offer an ideal adaptation of the actuator to the control system.

Due to the modular design of the AUMA MATIC simple modification and retro-fitting are possible.



Actuator controls automatic

Interface board (standard)



This board provides the interface for binary external and internal signals.

Potential separation by means of opto-isolators assures that disturbances from other external devices will not affect the internal controls.

Potential free relays are provided for the following signals:

- position of the selector switch, i.e. local or remote position
- end position OPEN or CLOSED reached
- collective fault signal, includes the following status signals: thermoswitch tripped, torque switch tripped in mid-travel, wrong phase sequence, phase failure

LEDs are provided for indication during fault diagnosis:

- remote control signals OPEN – STOP – CLOSE available
- wrong phase sequence, phase failure (only for part-turn actuators with 3-phase AC motor)
- thermoswitch (motor protection) tripped
- torque switch tripped in mid-travel

Timer board (option)



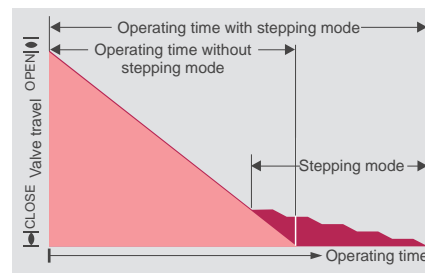
To increase the operating time for the entire or any portion of the swing range, a timer board can be provided.

Variations:

- Start and end of stepping mode can be set by means of intermediate switches (DUO limit switching)
- Defining start and end of stepping mode by external command

Setting of the timer

The on- and off-time can be set independently between 1 and 30 seconds by four potentiometers.



Fieldbus board (option)



With the fieldbus board integration in a fieldbus system is possible. AUMA offers fieldbus boards for the following fieldbus systems:

- PROFIBUS-FMS according to EN 50 170 Vol. 2
- PROFIBUS-DP according to EN 50 170 Vol. 2
- INTERBUS-S according to DIN 19 258
- MODBUS-RTU

Features of part-turn actuators with fieldbus interfaces

Commands
- OPEN - STOP - CLOSE - nominal value ¹⁾ (option)
Feedback signals
- End positions OPEN, CLOSED - Valve position ¹⁾ (option) - Selector switch position LOCAL/OFF/REMOTE - Running indication (depending on direction) - Torque switch tripped - Limit switch tripped - Manual operation ¹⁾ or operation by local control station ¹⁾ - Status of the analogue (2) and digital (4) customer inputs - Communication channel A or B (redundant channel) active
Error signals
- thermoswitch (motor protection) tripped - torque switch tripped in mid-travel - wrong phase sequence or phase failure - power supply failure of the fieldbus board - failure of an analogue input signal
Cable redundancy
- Optional second transmission line
Behaviour upon communication failure
Programmable for - fail as is - fail open/fail close - optional intermediate position ¹⁾
Analogue/ digital customer inputs (option)
- 2 free analogue inputs - 4 free digital inputs
Stepping mode ¹⁾ (option)
- Start and end of stepping mode as well as running and off time can be set via bus

1) requires potentiometer in actuator

For further information refer to separate brochures:

- PROFIBUS-FMS actuators
- AUMA INTERBUS-S actuators

Components AUMA MATIC

Logic board



The internal and external signals are processed on the logic board. The controls are programmed at the factory according to the customer's order. The required functions can be easily set or modified on site with the aid of DIP-switches.

Programming of the logic board

Function	Possibility
Stop at end position CLOSED ¹⁾	limit seating torque seating
Remote control	push-to-run operation continuous signal
Local control	push-to-run operation continuous signal
Collective fault signal	includes status signal 'Torque switch tripped in mid-travel'
	without status signal 'Torque switch tripped in mid-travel'

1) Must be defined by the valve manufacturer

Power supply board



The 24 VDC supply for the electronics is provided by the power supply board.

An additional output of 24 VDC may also be used to supply other components fitted in the actuator, such as an electronic position transmitter.

Reversing contactors



The reversing contactors for the motor controls are mechanically, electrically and electronically interlocked.

Thyristor unit (option, replaces reversing contactors)



Instead of reversing contactors a solid state unit (thyristor) can be mounted into the AUMA MATIC. Since switching is effected without moving contacts, there is no wear. The short response time is a further advantage.

Local controls



To operate the part-turn actuator locally the actuator controls AUMA MATIC are supplied with local controls.

With a lockable selector switch it is possible to select the control modes LOCAL, REMOTE or OFF.

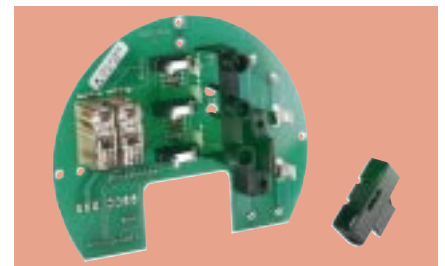
The push buttons OPEN, STOP, CLOSE serve for local control of the actuator.

As an option the actuator controls are available with three indication lights.

Indications:

- OPEN (green)
- FAULT (red)
- CLOSED (yellow)

Control and signal board



It contains primary fuses for the power supply and is accessible after removing the local controls.

Wall bracket



The actuator controls AUMA MATIC can be mounted on a wall bracket. This is recommended e.g. when the actuator is subjected to high temperatures, heavy vibration or installed at places with limited access.

AUMA SEMIPACT

AUMA SEMIPACT can be applied if the controls are supplied externally, but a local control station is still required.

Proposed external wiring diagrams

Proposed external wiring diagrams

The wiring diagrams show just two of many possibilities of external wiring for part-turn actuators SG in version AUMA NORM (without actuator controls AUMA MATIC).

The diagrams are based on part-turn actuators with 3-phase AC motor and basic equipment, closing the valve clockwise. They are drawn for the valve in an intermediate position, i.e. no switch is operated.

The motor is sufficiently protected by integrated thermostats. A thermal overload relay is not required, unless specified by national directives or company standards.

For explosion-proof part-turn actuators SGEx a thermal overload relay may be required to meet national directives.

Labour intensive installation and electric wiring can be considerably reduced if the integral actuator controls AUMA MATIC are applied instead of external controls. Limit or torque seating can be programmed easily in the AUMA MATIC via a DIP-switch.

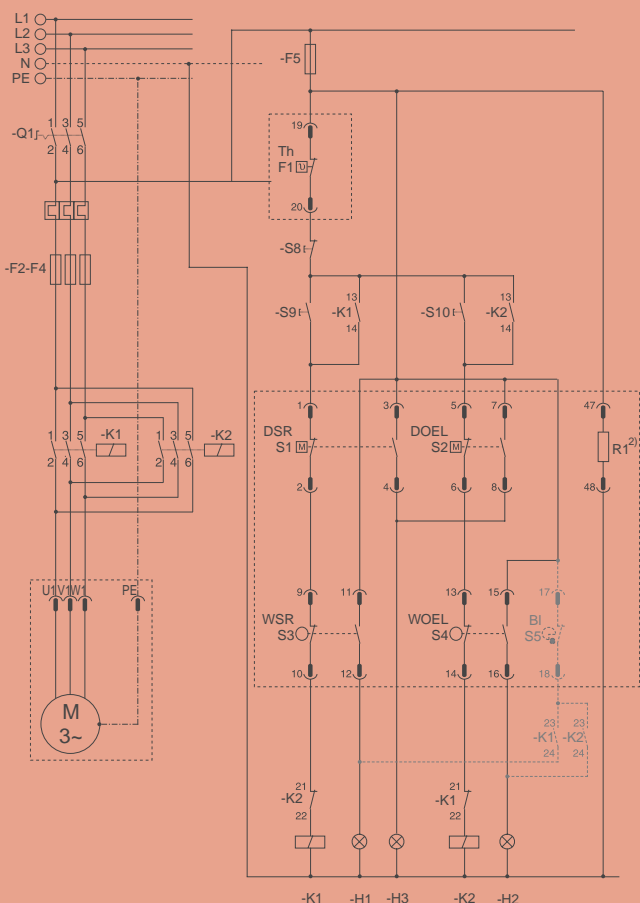
1) Explosion-proof part-turn actuators SGEx cannot be supplied with the actuator controls AUMA MATIC.

ASV 111.1111 KMS TP 100 / 001

End position CLOSED limit seating, end position OPEN limit seating; commonly used for butterfly valves and ball valves

Switch development diagram for entire valve travel

	CLOSED	OPEN
DSR	1 + 2	
	3 + 4	
DÖL	5 + 6	
	7 + 8	
WSR	9 + 10	
	11 + 12	
WÖL	13 + 14	
	15 + 16	



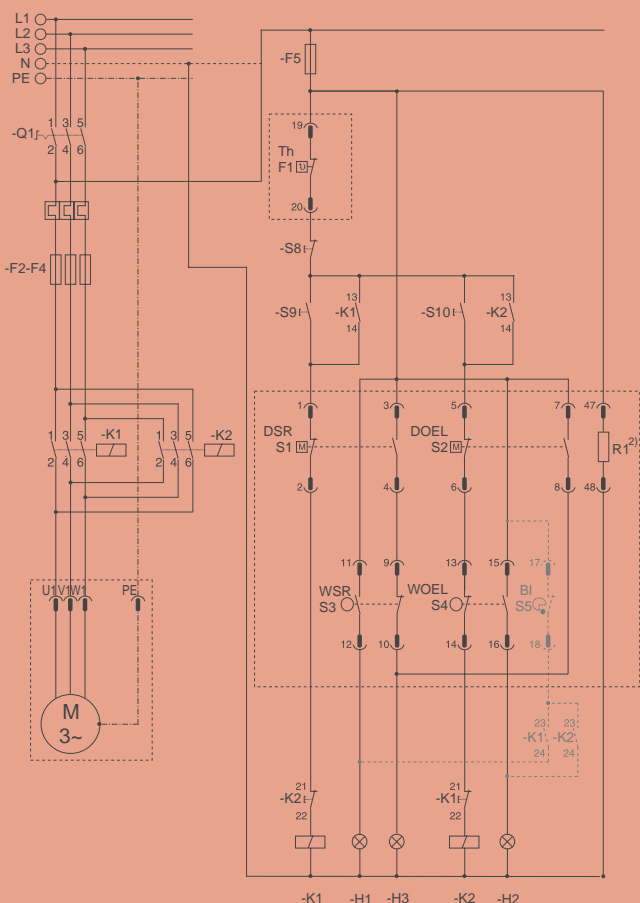
- S1 DSR Torque switch closing, clockwise rotation
- S2 DÖL Torque switch opening, counter-clockwise rotation
- S3 WSR Limit switch closing, clockwise rotation

ASV 111.1121 KMS TP 100 / 001

End position CLOSED torque seating, end position OPEN limit seating; commonly used for butterfly valves with metal-seat

Switch development diagram for entire valve travel

	CLOSED	OPEN
DSR	1 + 2	
	3 + 4	
DÖL	5 + 6	
	7 + 8	
WSR	9 + 10	
	11 + 12	
WÖL	13 + 14	
	15 + 16	



- S4 WÖL Limit switch opening, counter-clockwise rotation
- S5 BI Blinker switch (option)
- F1 Th Thermostat
- R1²⁾ H Space heater

2) Consider the voltage range of the space heater

Electrical connections and valve attachment

Electrical connections

Connections for supply voltage and remote control are on the AUMA multi-pin plug. This applies to both AUMA NORM and AUMA MATIC actuators. The explosion-proof

actuators SGEx are an exception, the electrical connection is via terminals.

AUMA plug-/socket connector



Technical data

Connections:

- Power supply
- 1 pole for protective earth
- max. 48 poles for controls

Threads for cable glands:¹⁾

- 2 x Pg 21
- 1 x Pg 13,5

Type of connection:

- Screws flexible cables, max. 6 mm² for power supply max. 2,5 mm² for controls
- Crimp (option)

Terminals



Technical data

Connections:

- Power supply
- Terminal for protective earth
- max. 48 terminals for controls

Threads for cable glands:¹⁾

- 2 x Pg 21
- 1 x Pg 13,5

Type of connection:

- Screws for power supply max. 10 mm²
- Cage clamps for controls max. 2,5 mm²

1) other thread combinations, e.g. metric or NPT- threads possible on request

Valve attachment

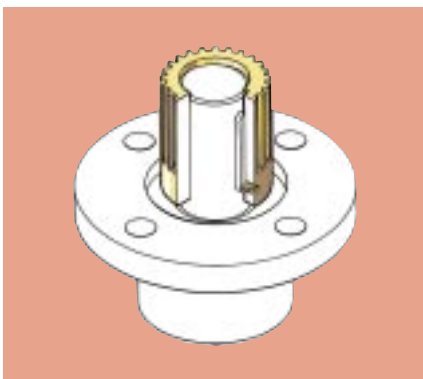
The valve mounting dimensions are according to ISO 5211; on request they are available in other standard sizes (refer to Technical Data, page 15).

With a coupling splined according to DIN 5480 a firm connection to the valve shaft is possible.

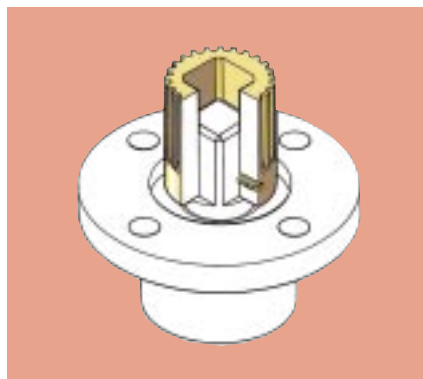
The separate plug-in coupling offers the following advantages:

- easy finish machining of the coupling bore (on request ex works) matching to the valve shaft
- fast and easy mounting and dismounting of the actuator on site
- actuator can be re-positioned on the valve by 4 x 90°; the settings remain undisturbed

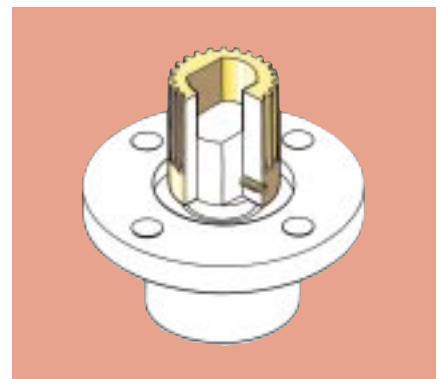
The coupling is available in the forms that are shown below. On request a grub screw can be provided to secure the coupling on the valve shaft.



Bore with keyway (DIN 6885 T. 1)



Square bore (DIN 79)



Bore with two flats

Technical data

Technical data for part-turn actuators SG and SGEx

Size	Tripping torque	Operating time with 1- phase AC motor ¹⁾	Operating time with 3-phase AC motor ²⁾	Valve attachment					Weight (with 3-phase AC motor)	Weight (with 1-phase AC motor)
				Flange size accord. to ISO 5211		Valve shaft				
				Standard	Option	Ø max. [mm]	Square bore max. [mm]	Bore with 2 flats max. [mm]		
SG	Setting range [Nm]	for 90° travel [s]	for 90° travel [s]							
05.1	90 - 150	5,6 - 45	4/5,6/8/11/16/22	F05	F07	25,4	22	22	18	19
07.1	120 - 300	11 - 90	5,6 ³⁾ /8/11/16/22/32	F07	F10	25,4	22	22	18	19
10.1	250 - 600	11 - 90	11 ³⁾ /16/22/32/45/63	F10	F12	38	30	27	24	25
12.1	500 - 1 200	22 - 180	22 ³⁾ /32/45 ³⁾ /63	F12	F14	50	36	41	28	29

Standard voltages/frequencies

3-phase AC motors										
Voltage ⁴⁾ [V]	220	230	240	380	400	415	440	460	500	
Frequency [Hz]	50	50	50	50	50	50	60	60	50	

1-phase AC motor		
Voltage ⁴⁾ [V]	110 - 120	220 - 240
Frequency [Hz]	50 / 60	50 / 60

- 1) adjustable operating time
- 2) the required operating time must be indicated on the purchase order
- 3) for reduced torques, refer to Technical data AUMA part-turn actuators SG 05.1 - SG 12.1
- 4) permissible fluctuation of nominal voltage $\pm 5\%$
Over voltage may result in inadmissible temperature rise in the motor windings
In case of under voltage the motor torque decreases with the square of the voltage.
Larger voltage variations have therefore to be considered when sizing the actuator.

Technical data for actuator controls AUMA MATIC

Weight	approx. 6,5 kg
Power supply	
Motor power controls	reversing contactors thyristor reversing unit
Voltage	refer to standard voltages/frequencies for part-turn actuators SG
Motor power	max. 1,5 kW
Interlocking	mechanical, electrical/electronic electronic
Controls	
Current consumption for signals	at 24 V DC 10 - 15 mA
Remote control (supply)	24 V DC; from AUMA MATIC or external supply Option: 220 V AC (external supply)
Input signals	3 input signals OPEN – STOP ⁵⁾ – CLOSE galvanically separated by opto-isolators
Output signals	End positions OPEN – CLOSED Selector switch in position LOCAL – REMOTE Collective fault signal ⁶⁾
Local controls	Selector switch (lockable) LOCAL – OFF – REMOTE Push buttons OPEN – STOP – CLOSE Indication lights ⁷⁾ OPEN – FAULT – CLOSED

- 5) In push-to-run operation (OPEN - CLOSE as continuous signals) not required, e.g. when controlled by PLC
- 6) Motor protection tripped, phase failure, wrong phase sequence, tripping torque reached in mid-travel. The actuator is switched off by the respective event. The cause of fault is indicated by two built-in LED's in the actuator controls AUMA MATIC.
- 7) Option

For detailed technical data please refer to the technical data sheets

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