SIEMENS

7815

SQM5 gear side with drive shaft no. 7

SQM5 rear side, design without a second drive shaft end

SQM5 rear side, design with 2 drive shaft ends

Actuators for Air and Gas Dampers

SQM5...

with electronic modules

- **Electromotive actuator with up to 40 Nm torque**
- **Clockwise and counterclockwise variants**
- **Running times from 10 to 90 seconds**
- **Different shaft designs available**
- **With 1 or 2 drive shaft ends, drive shafts interchangeable or available separately**
- **Can be equipped with electronic modules for control and position feedback signal via steady signals**
- **Internal and external position indication**
- **Drive shaft and camshaft can be disengaged separately**
- **Variants with UL certification**

The SQM5... and this Data Sheet are intended for use by OEMs which integrate the SQM5... in their products!

Use

The SQM5 actuators are designed to drive air and gas dampers. Areas of application are oil and gas burners of medium to larger capacity.

The actuators are used primarily for the load-dependent control of the gas flow, oil volume and combustion air volume:

- In connection with 3-position or modulating controllers (e.g. 4...20 mA), and/or
- Directly by burner controls

Supplementary documentation

Product type	Type of documentation	Documentation number
ASZ	Data sheet	N7921
AGA56	Data sheet	N7922

Warning notes

To avoid injury to persons, damage to property or the environment, the following warning notes must be observed!

Only qualified staff may open, interfere with or modify the actuators!

- Read the documentation on the actuators carefully and fully. If not observed, dangerous situations can occur
- The user must ensure that the actuators meet the requirements of the relevant application standards
- All product-related activities (mounting, settings and maintenance) must be performed by qualified and authorized personnel

Caution!

- Risk of electric shock – to disconnect the equipment from the power, it may be necessary to open more than one switch. Before performing maintenance work, the equipment must be disconnected from the power supply
- The electrical connection between the conduit fittings is not made automatically. It must be established on the installation site
- The connecting plate is made of plastic and does not provide earthing of the conduit fittings. Earthing must be ensured by adequate washers and wire links
- All cam switch settings must satisfy the requirements of the relevant application standards

- To ensure protection against electric shock, the connection terminals must have adequate protection. Make certain that non-insulated connections or wires cannot be touched
- Each time work has been carried out (mounting, installation, service work, etc.), check to ensure that wiring is in an orderly state
- Fall or shock can adversely affect the safety functions. Such actuators must not be put into operation even if they do not exhibit any damage
- Static charges must be avoided since they can damage the electronic components on contact.
  Recommendation: Use ESD equipment

Notes on use in North America

- Only flexible conduits with relevant accessories may be used
- Only copper conductors may be used
- All Class 2 circuits must be wired with CL3, CL3R, CL3P or equivalent cables
  OR
  All circuits are wired according to Class 1 (electric light or power circuits)

Mounting notes

- Ensure that the relevant national safety regulations are complied with
- In the geographical areas where DIN regulations are in use, the requirements of VDE must be complied with, especially DIN/VDE 0100, 0550 and DIN/VDE 0722
- Make certain that the actuator is not exposed to direct solar radiation
- Tightening torques
  - Cover screws: 3.5 Nm
  - Connecting cover: 2 Nm

Installation notes

- Ensure that the electrical wiring is in compliance with national and local regulations
- Make certain that strain relief of the connected cables is in compliance with the relevant standards
  (e.g. in accordance with DIN EN 60730 and DIN EN 60335)
- Ensure that spliced wires cannot come into contact with neighboring terminals. Use suitable ferrules
- SQM5 terminals that are not used must be protected by dummy plugs
- When wiring the unit, separation between the 120 V AC or 230 V AC range and the other voltage ranges must be maintained in order to ensure protection against electric shock
- The connection between the actuator drive shaft and the relevant controlling element must be form-fitted
- Only plastic versions of cable glands may be used

Standards and certificates

Applied directives:

- Low-voltage directive 2014/35/EC
- Electromagnetic compatibility EMC (immunity) 2014/30/EC

Compliance with the regulations of the applied directives is verified by the adherence to the following standards / regulations:

- Automatic electrical controls for household and similar use Part 1: General requirements DIN EN 60730-1
- Automatic electrical controls for household and similar use Part 2-14: Particular requirements for electric actuators DIN EN 60730-2-14

The relevant valid edition of the standards can be found in the declaration of conformity!

EAC Conformity mark (Eurasian Conformity mark)

ISO 9001:2015
ISO 14001:2015
OHSAS 18001:2007

China RoHS
Hazardous substances table:
http://www.siemens.com/download?A6V10883536

For use in the U.S. / Canada, the actuators carry type suffix «R» (see example) and are UL- and CSA-listed.

Example: SQM50.480**R**1

Lifetime

The actuator has a designed lifetime* of 250,000 burner startup cycles (OFF ⇨ ON ⇨ OFF) under load with the rated torque in the entire rotation angle range, which under normal operating conditions in heating mode corresponds to approx. 10 years of service (starting from the production date given on the nameplate). This is based on the endurance tests specified in the standard EN 298.
A summary of the conditions has been published by the European Control Manufacturers Association (Afecor) (www.afecor.org).

The lifetime is based on use of the actuator according to the manufacturer's data sheet. After reaching the designed lifetime in terms of the number of burner startup cycles, or after the corresponding usage time, the actuator must be replaced by authorized personnel.

*The designed lifetime is not the warranty time specified in the Terms of Delivery

Disposal notes

The actuator contains electrical and electronic components and must not be disposed of together with domestic waste.
Local and currently valid legislation must be observed.

Mechanical design

Housing

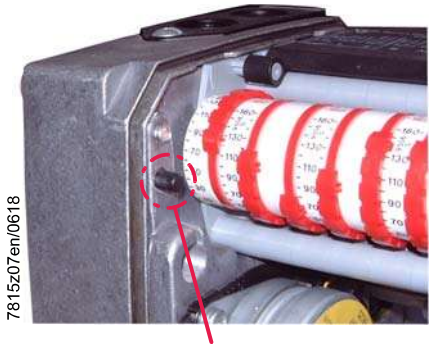
- Housing sections made of die-cast aluminum
- Covers made of impact-proof and heat-resistant plastic

Drive motor

- Synchronous motor

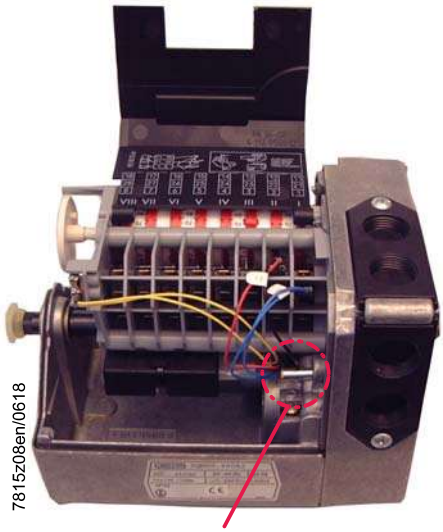
Couplings

- Driven shaft and cam shaft can be adjusted via 2 separately couplers, independent of the gear train
- Shaft can be manually disengaged from the gear and motor by operating the coupling (coupling pin (Kx), refer to *Technical data*)
- Automatic reengagement
- Coupling pin (K1 and K2)
- Separation of gear and camshaft using coupling pin (K1)



Coupling pin "K1"

- Separation of drive shaft and gear using coupling pin (K2)



Coupling pin "K2"

Cam shaft drive

- Backlash-free gearing

Adjustment of switching points

- Via rotating cams
- Scales adjacent to the cams indicate the angle of the switching point

Position indication

- Internally:
  – Scale at the end of the drive shaft
  – Black scale for counterclockwise rotation, single arrow on the cam
  – Red scale for clockwise rotation, double arrow on the cam
- Externally:
  – Scale in viewing window

Mechanical design (cont´d)

Electrical connections	• Blade terminal on micro switch • Screw terminals for «N» and «PE» • Subassembly and fixing of wiring by means of removable Pg plastic insert possible • Easy introduction of cables through large openings in the housing • Fixing of Pg insert with all cables by means of a screw
Gear train	• Maintenance-free gearwheels and bearings
Drive shaft	• Secured with a removable circlip • Easily exchangeable • With corresponding shaft both sides transmission possible • Different shaft designs available
Actuator fixing	• Fixing holes on the front of the housing and at the bottom • Front fixing also possible from inside the housing • Variable mounting height through the use of an extra adapter

Type summary (other types are available on request)

AC 24 V -15/+10%, 50…60 Hz ±6%

Standard types! (other versions on request)		Torque and holding torque 3)	Running time at 50 Hz for angular rotation 1)		Auxiliary switches incl. 2 end switches	Type of shaft	Electronic module (integrated ex works) 5)	Potentiometer (integrated ex works) 6)
Article no.	Type	Max. Nm 2)	90°	130°	Piece	**AGA…**	**AGA…**	**ASZ…**
BPZ:SQM50.380A8	**SQM50.380A8**	15	15 s	22 s	8	--- [4])	---	---
BPZ:SQM50.454A8	**SQM50.454A8**	15	34 s	49 s	5	**58.4**	**---**	---
BPZ:SQM50.480A8	**SQM50.480A8**	15	34 s	49 s	8	--- [4])	**---**	---
BPZ:SQM50.480A8Z3	**SQM50.480A8Z3**	15	34 s	---	8	--- [4])	56.9A87	**12.30**
BPZ:SQM50.483A8	**SQM50.483A8**	15	34 s	49 s	8	**58.3**	---	---
BPZ:SQM50.483A8Z3	**SQM50.483A8Z3**	15	34 s	---	8	**58.3**	56.9A87	**12.30**
BPZ:SQM50.543A8	**SQM50.543A8**	15	45 s	65 s	4	**58.3**	**---**	---
BPZ:SQM50.680A8	**SQM50.680A8**	15	60 s	87 s	8	--- [4])	**---**	---
BPZ:SQM53.480A8	**SQM53.480A8**	25	30 s	43 s	8	--- [4])	**---**	---
BPZ:SQM56.687A8	**SQM56.687A8**	40	60 s	87 s	8	**58.7**	**---**	---

Technical data

General unit data

Kind of current	AC
Operating voltage and operating frequency	Refer to «Type summary»
Drive motor	Synchronous motor
Power consumption	20 VA
Angular rotation	Between 0° and max. 160° (scale range)
Mounting position	Optional
Degree of protection	IP54 (provided knockout holes remain closed for mounting or are closed off, with adequate cable entries)
Safety class	I
External overload fuse	Max. 6.3 AT (slow), to DIN EN 60127-2/5
Internal overload fuse	Max. 2 AT (slow), depending on the type
Cable entry	4 x Pg13.5 with thread
Wire cross-sectional area of the connecting wires, including earth terminal (PE)	0.5...2.5 mm²
Direction of rotation	Facing the gear train side: counterclockwise or clockwise (selectable), delivery: **counterclockwise**
Torque	See the *Torques* diagram and *Drive shafts* accessories
Holding torque	Max. torque
Running time	10...90 s (refer to «Type summary») [1)]
Pause time at change in direction of rotation	> 100 ms
End and auxiliary switches	
• Type	To DIN 41636
• Switching voltage	AC 24...250 V
• Switching capacity	To CEE 24 / VDE 0630 7.5 (3) A, AC 250 V
Number of end switches	2
Number of auxiliary switches	Max. 6, depending on the type
Drive shaft	Replaceable
Weight	Approx. 3.3 kg
Temperature of the mounting surface	Max. 60 °C
Lifecycle	250,000 start cycles (OFF ⇨ ON ⇨ OFF) under load with the rated torque in the entire rotation angle range. 2,000,000 control cycles under load with 75% of rated torque in rotation angle range of 10°

1) Specifications apply to ambient temperatures of 23 °C and a mains voltage of 120 V AC or 230 V AC and a mains frequency of 50 Hz. With a mains frequency of 60 Hz, the running times are approx. 20% shorter.
Torques lower by the same rate.