



SQM5..., gear train side with drive shaft no. 7



SQM5..., rear, version without second drive shaft end



SQM5..., rear, version with 2 drive shaft ends

Actuators for Air and Gas Dampers

SQM5...

with electronic modules

- Reversible electromotive actuators up to 40 Nm
- Running times from 10 to 90 seconds
- With 1 or 2 drive shaft ends; drive shafts can be exchanged or available as separate items
- Can be equipped with electronic modules for control and position feedback signal via steady signals
- Internal and external position indication
- Drive shaft and cam shaft can be separately disengaged
- Choice of UL-listed types for use in the U.S. and Canada
- Supplementary Data Sheets, refer to N7921 and N7922

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

Use

The SQM5... actuators are used to drive air and gas dampers of oil and gas burners of medium to large capacity.

They are used primarily for load-dependent control of the amounts of gas, oil and combustion air:

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

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!

- All activities (mounting, installation and service work, etc.) must be performed by qualified staff
- Before making any wiring changes in the connection area, completely isolate the plant from mains supply (all-polar disconnection). Ensure that the plant cannot be inadvertently switched on again and that it is indeed dead. If not observed, there is a risk of electric shock hazard
- Ensure protection against electric shock hazard by providing adequate protection for the connection terminals
- Protection against electric shock hazard is ensured by folding upwards cover of control unit (made of plastic), allowing safe setting of the cams when mains voltage is present
- 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

Mounting notes

- Ensure that the relevant national safety regulations are complied with

Standards and certificates



Conformity to EEC directives
- Electromagnetic compatibility EMC (immunity)
- Low-voltage directive

2004/108/EC
2006/95/EC





ISO 9001: 2008
Cert. 00739



ISO 14001: 2004
Cert. 38233



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

Example: SQM50.480R1

Disposal notes

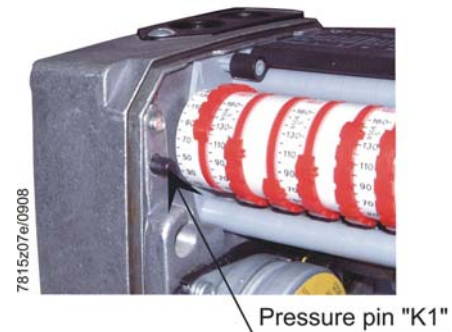


The actuator contains electrical and electronic components and must not be disposed of together with domestic waste.
Local and currently valid legislation must be observed.

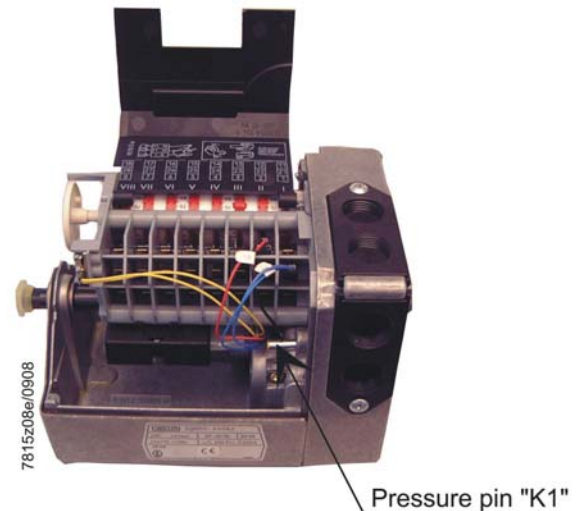
Mechanical design

- Housing
- Housing sections made of die-cast aluminium
 - Covers made of impact-proof and heat-resistant plastic
- Drive motor
- Reversible and locking-proof synchronous motor
- Couplings
- Driven shaft and cam shaft can be adjusted via 2 separately couplers, independent of the gear train
 - Shaft can be disengaged from gear train and motor via manual operation of a coupler (pressure pin «K», refer to «Technical data»).
 - Automatic reengagement
 - Pressure pin «K...»

- Disengagement of gear train / cam shaft by pressing pin «K1»



- Disengagement of cam / gear train by pressing pin «K2»



- Cam shaft drive
- Backlash-free gearing
- Adjustment of switching points
- With rotating cams
 - Scales beside 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 | <ul style="list-style-type: none">• 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 | <ul style="list-style-type: none">• Maintenance-free gearwheels and bearings |
| Drive shaft | <ul style="list-style-type: none">• Secured with a removable circlip• Easily exchangeable• With corresponding shaft both sides transmission possible |
| Actuator fixing | <ul style="list-style-type: none">• 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)

When ordering, please give type reference according to following tables. Accessories are to be ordered separately. Actuators with premounted accessories are only available on request.

AC 220 V -15 %...AC 240 V+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) |
|---|---|--|------|--|---------------|--|---|
| | | 90° | 130° | | | | |
| Type reference | max. Nm 2) | Piece | | AGA... | AGA... | ASZ... | |
| SQM50.260A2G4 | 10 | 10 s | 14 s | 4 | --- | 56.41A27 | 12.33 |
| SQM50.341A2 | 10 | 15 s | 22 s | 4 | 58.1 | --- | --- |
| SQM50.341A2G3 | 10 | 15 s | 22 s | 4 | 58.1 | 56.41A27 | 12.30 |
| SQM50.341A2K3 | 10 | 15 s | 22 s | 4 | 58.1 | 56.43A27 | 12.30 |
| SQM50.381A2 | 10 | 15 s | 22 s | 8 | 58.1 | --- | --- |
| SQM50.381A2G3 | 10 | 15 s | 22 s | 8 | 58.1 | 56.41A27 | 12.30 |
| SQM50.387A2 | 15 | 15 s | 22 s | 8 | 58.7 | --- | --- |
| SQM50.387A2G3 | 15 | 15 s | 22 s | 8 | 58.7 | 56.41A27 | 12.30 |
| SQM50.441A2 | 10 | 30 s | 43 s | 4 | 58.1 | --- | --- |
| SQM50.441A2G3 | 10 | 30 s | 43 s | 4 | 58.1 | 56.41A27 | 12.30 |
| SQM50.480A2 | 15 | 30 s | 43 s | 8 | --- | --- | --- |
| SQM50.480A2Z3 | 15 | 30 s | 43 s | 8 | --- | 56.9A27 | 12.30 |
| SQM50.481A2 | 10 | 30 s | 43 s | 8 | 58.1 | --- | --- |
| SQM50.481A2G3 | 10 | 30 s | 43 s | 8 | 58.1 | 56.41A27 | 12.30 |
| SQM50.481A2Z3 | 10 | 30 s | 43 s | 8 | 58.1 | 56.9A27 | 12.30 |
| SQM50.482A2 | 15 | 30 s | 43 s | 8 | 58.2 | --- | --- |
| SQM50.482A2Z3 | 15 | 30 s | 43 s | 8 | 58.2 | 56.9A27 | 12.30 |
| SQM50.483A2Z3 | 15 | 30 s | 43 s | 8 | 58.3 | 56.9A27 | 12.30 |
| SQM50.681A2 | 10 | 60 s | 87 s | 8 | 58.1 | --- | --- |
| SQM53.482A2 | 20 | 30 s | 43 s | 8 | 58.2 | --- | --- |
| SQM53.482A2Z3 | 20 | 30 s | 43 s | 8 | 58.2 | 56.9A27 | 12.30 |
| SQM53.489A2 | 25 | 30 s | 43 s | 8 | 58.9 | --- | --- |
| SQM54.480A2 | 25 | 30 s | 43 s | 8 | --- | --- | --- |
| SQM54.482A2 | 20 | 30 s | 43 s | 8 | 58.2 | --- | --- |
| SQM54.580A2 | 25 | 45 s | 65 s | 8 | --- | --- | --- |
| SQM56.680A2 | 40 | 60 s | 87 s | 8 | --- | --- | --- |
| SQM56.684A2G4 | 30 | 60 s | 87 s | 8 | 58.4 | 56.41A27 | 12.33 |
| SQM56.684A2Z3 | 30 | 60 s | 87 s | 8 | 58.4 | 56.9A27 | 12.30 |
| SQM56.687A2 | 40 | 60 s | 87 s | 8 | 58.7 | --- | --- |
| SQM56.687A2G3 | 40 | 60 s | 87 s | 8 | 58.7 | 56.41A27 | 12.30 |
| SQM56.687A2Z3 | 40 | 60 s | 87 s | 8 | 58.7 | 56.9A27 | 12.30 |

- 1) At 60 Hz frequency, running times are about 17 % shorter
- 2) Based on 250,000 position changes
- 3) Refer to «Drive shafts» and «Torques», depending on voltage
- 4) Drive shaft to be ordered separately
- 5) For details, refer to Data Sheet N7922
- 6) For details, refer to Data Sheet N7921

Type summary (other types are available on request) [cont'd]

AC 110 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) |
|--|---------------------------------|--|------|---|-------------------|---|---|
| | | 90° | 130° | | | | |
| Type reference | max. Nm 2) | Piece | | AGA... | AGA... | ASZ... | |
| SQM50.480A1 | 15 | 30 s | 43 s | 8 | --- ⁴⁾ | --- | --- |
| SQM50.480A1Z3 | 15 | 30 s | 43 s | 8 | --- ⁴⁾ | 56.9A17 | 12.30 |
| SQM50.481A1G3 | 10 | 30 s | 43 s | 8 | 58.1 | 56.41A17 | 12.30 |
| SQM50.483A1Z3 | 15 | 30 s | 43 s | 8 | 58.3 | 56.9A17 | 12.30 |
| SQM53.480A1 | 25 | 30 s | 43 s | 8 | --- ⁴⁾ | --- | --- |
| SQM53.482A1Z3 | 20 | 30 s | 43 s | 8 | 58.2 | 56.9A17 | 12.30 |
| SQM56.687A1 | 40 | 60 s | 87 s | 8 | 58.7 | --- | --- |
| SQM56.687A1Z3 | 40 | 60 s | 87 s | 8 | 58.7 | 56.9A17 | 12.30 |

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) |
|--|---------------------------------|--|------|---|-------------------|---|---|
| | | 90° | 130° | | | | |
| Type reference | max. Nm 2) | Piece | | AGA... | AGA... | ASZ... | |
| SQM50.380A8 | 10 | 15 s | 22 s | 8 | --- ⁴⁾ | --- | --- |
| SQM50.443A8 | 15 | 30 s | 43 s | 4 | 58.3 | --- | --- |
| SQM50.444A8 | 15 | 30 s | 43 s | 4 | 58.4 | --- | --- |
| SQM50.444A8Z3 | 15 | 30 s | 43 s | 4 | 58.4 | 56.9A87 | 12.30 |
| SQM50.454A8 | 15 | 30 s | 43 s | 5 | 58.4 | --- | --- |
| SQM50.483A8 | 15 | 30 s | 43 s | 8 | 58.3 | --- | --- |
| SQM50.483A8A3 | 15 | 30 s | 43 s | 8 | 58.3 | 56.1A97 | 12.30 |
| SQM50.483A8Z3 | 15 | 30 s | 43 s | 8 | 58.3 | 56.9A87 | 12.30 |

AC 110 V -15 % / +10 %, 60 Hz ±6 %, UL-registered

| 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) |
|--|---------------------------------|--|------|---|-------------------|---|---|
| | | 90° | 130° | | | | |
| Type reference | max. Nm 2) | Piece | | AGA... | AGA... | ASZ... | |
| SQM50.360R1 | 15 | 15 s | 22 s | 6 | --- ⁴⁾ | --- | --- |
| SQM50.361R1G4 | 10 | 15 s | 22 s | 6 | 58.1 | 56.41A17 | 12.33 |
| SQM50.367R1G3 | 10 | 15 s | 22 s | 6 | 58.7 | 56.41A17 | 12.30 |
| SQM50.481R1 | 10 | 30 s | 43 s | 8 | 58.1 | --- | --- |
| SQM54.560R1A | 25 | 45 s | 65 s | 6 | --- ⁴⁾ | 56.1A97 | --- |
| SQM56.687R1 | 40 | 60 s | 87 s | 8 | 58.7 | --- | --- |

The actuators are

- also meet CE requirements
- are of the same basic design as the equivalent standard types

- 1) At 60 Hz frequency, running times are about 17 % shorter
- 2) Based on 250,000 position changes
- 3) Refer to «Drive shafts» and «Torques», depending on voltage
- 4) Drive shaft to be ordered separately
- 5) For details, refer to Data Sheet N7922
- 6) For details, refer to Data Sheet N7921

Accessories

Potentiometers ASZ...

- ASZxx.3x refer to Data Sheet N7921
- ASZxx.7xx refer to Mounting Instruction M7921 (4 319 9604 0)
- ASZxx.8xx refer to Mounting Instruction M7806 / M7808 / M7812 (4 319 2263 0)
- ASZxx.9xx refer to Mounting Instruction M7806 / M7808 / M7812 (4 319 2263 0)

Mounting kit

ASK33.9

- For fitting the SQM5... to butterfly valves VKF41... , always with drive shaft AGA58.1
- Refer to Mounting Instruction M7815.4 (4 319 9535 0)



Pg insert

AGA55.2

- Inclusive sealing and screw, for SQM5...

Kit for shaft seal

AGA55.5

- For sealing the shaft feed through and therewith for perfecting the degree of protection
- On both sides shaft seals for actuator SQM5...
- Packed as kit together with O-rings inclusive mounting screws
- Refer to Mounting Instruction M7815.5 (74 319 0577 0)

Spacer

AGA57.1

- Adapter for SQM10... / SQM20...
- Refer to Mounting Instructions M7815.1 (4 319 9529 0)

Adapter for actuator ME8

AGA57.2

- Refer to Mounting Instruction M7815.2 (4 319 9536 0)

Adapter for Honeywell Mod. III actuator

AGA57.3

- Refer to Mounting Instruction M7815.2 (4 319 9536 0)

Electronic modules

AGA56...

- For control of the actuator
- Modular installable, complete with mounting frame and fixing screws
- Refer for AGA56.1... Data Sheet N7922 and Mounting Instruction M7922.3 (4 319 9602 0)
- Refer for AGA56.4... Data Sheet N7922 and Mounting Instruction M7922.2 (4 319 9542 0)
- Refer for AGA56.9... Data Sheet N7922 and Mounting Instruction M7922.1 (4 319 9532 0)

Drive shafts:

| Type of drive shaft | Max. torque | Type no. | Order no. |
|--|-------------|----------|--------------------|
| 10 mm dia., single-sided , Woodruff key to DIN 6888, equivalent to drive shaft of SQM10... | 10 Nm | 1 | AGA58.1 |
| 10 mm dia., single-sided , Woodruff key to DIN 6888, equivalent to drive shaft of SQM10..., packs of 10 pieces | 10 Nm | 1 | AGA58.1(10) |
| 12 mm dia., single-sided , Woodruff key to DIN 6888, equivalent to drive shaft of SQM20... | 20 Nm | 2 | AGA58.2 |
| 9 mm square, double-sided , equivalent to drive shaft of ME8 | 25 Nm | 3 | AGA58.3 |
| 9.5 mm square, double-sided , equivalent to drive shaft of Honeywell Mod. III | 30 Nm | 4 | AGA58.4 |
| 9.5 mm square, double-sided , equivalent to drive shaft of Honeywell Mod. III, packs of 10 pieces | 30 Nm | 4 | AGA58.4(10) |
| 10 mm dia. gear train side, 9,5" square rear , Woodruff key to DIN 6888, equivalent to drive shaft of Honeywell Mod. SQM10... | 10 | 6 | AGA58.6 |
| 14 mm dia., single-sided with parallel key to DIN 6885, mandatory with SQM56... | 40 Nm | 7 | AGA58.7 |
| 14 mm dia., single-sided with parallel key to DIN 6885, mandatory with SQM56..., packs of 10 pieces | 40 Nm | 7 | AGA58.7(10) |
| 12 mm square, single-sided | 30 Nm | 9 | AGA58.9 |

Refer to Mounting Instruction M7815.3 (4 319 9534 0)

Technical data

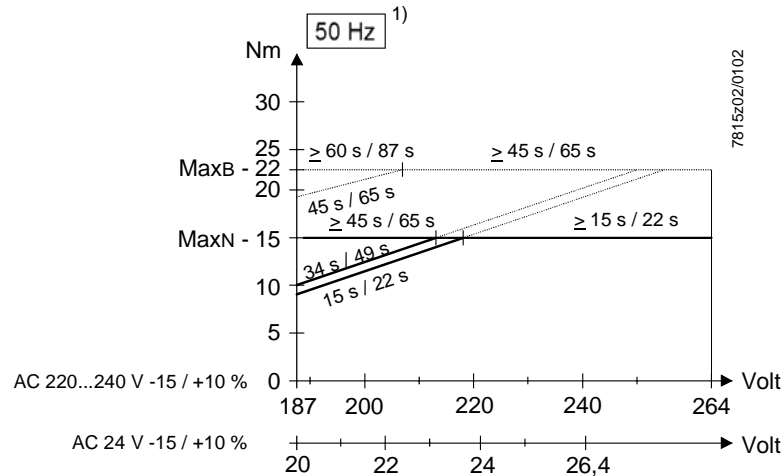
| | | |
|---|---------------------------------|---|
| General unit data | Kind of current | AC |
| | Operating voltage and frequency | Refer to «Type summary» |
| | Drive motor | Synchronous motor |
| | Power consumption | 20 VA |
| | Angular rotation | Adjustable between 0° and max. 160° (scale range) |
| | Mounting position | Optional |
| | Degree of protection | IP54 (provided knockout holes remain closed for mounting or are closed off, with adequate cable entries) |
| | Cable entry | 4 x Pg13.5 with thread |
| | Direction of rotation | Facing the gear train side: counterclockwise or clockwise (selectable), delivery: counterclockwise |
| | Torque | Refer to torque charts and drive shafts |
| | Holding torque | Max. torque |
| | Running time | 10...90 s (refer to «Type summary») |
| | 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 |
| | Drive shaft | Exchangeable |
| | Weight | Approx. 3.3 kg |
| | Lifecycle | Cycles (CLOSE ⇔ OPEN ⇔ CLOSE) with rated torque: typically 250.000 |
| | Environmental conditions | Storage |
| Climatic conditions | | Class 1K2 |
| Mechanical conditions | | Class 1M2 |
| Temperature range without integrated AGA56... | | -50...+60 °C |
| Humidity | | <95 % r.h. |
| Transport | | DIN EN 60721-3-2 |
| Climatic conditions | | Class 2K2 |
| Mechanical conditions | | Class 2M2 |
| Temperature range without integrated AGA56... | | -50...+60 °C |
| Humidity | | <95 % r.h. |
| Operation | | DIN EN 60721-3-3 |
| Climatic conditions | | Class 3K3 |
| Mechanical conditions | | Class 3M3 |
| Temperature range without integrated AGA56... | | -20...+60 °C |
| Humidity | | <95 % r.h. |



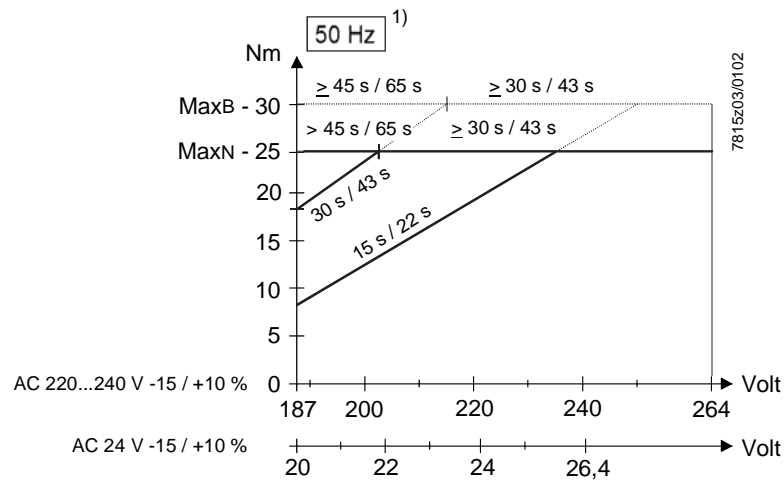
Caution!
Condensation, formation of ice and ingress of water are not permitted!

Torques

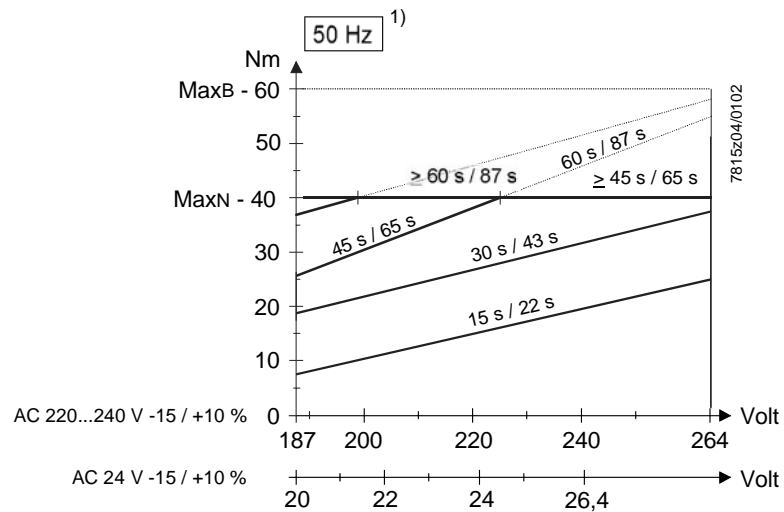
SQM50...



SQM53... / SQM54...



SQM56...



Legend

1) At 60 Hz frequency, running times are about 17 % shorter and torques are proportionally lower



Note!

Each drive side is capable of delivering the maximum torque, but the total torque of both sides must not exceed the maximum permissible torque of actuator.

With appropriate running time for 90° / 130°:

}} Torque in continuous operation

----- Release or starting torque = short-time torque

MaxN Max. permissible torque in continuous operation for all running times

MaxB Max. permissible release or starting torque for all running times

Connection terminals

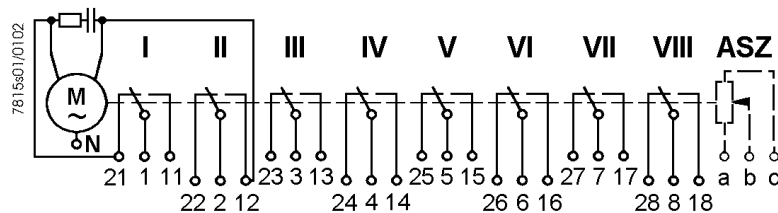
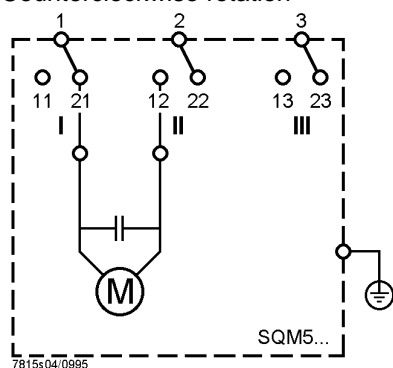


Diagram shows the maximum number of switches (2 end and 6 auxiliary switches). On versions with fewer than 6 auxiliary switches, the higher numbers are not used. For example, the actuator version with 2 end and 2 auxiliary switches does not use switches V, VI, VII and VIII.

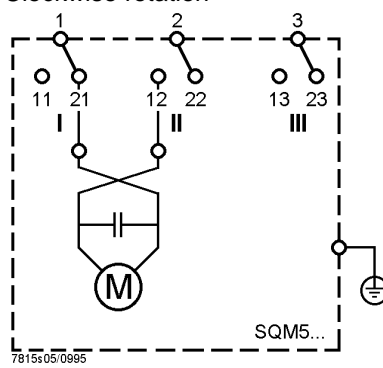
Direction of rotation

By exchanging the 2 motor connecting cables, the actuator's direction of rotation can be changed from counterclockwise to clockwise.

Counterclockwise rotation



Clockwise rotation



Note!

When changing the direction of rotation from counterclockwise to clockwise, the cams must be readjusted.



Clockwise rotation:

Red scales on the cam shaft, double arrow on the cams.

Counterclockwise rotation:

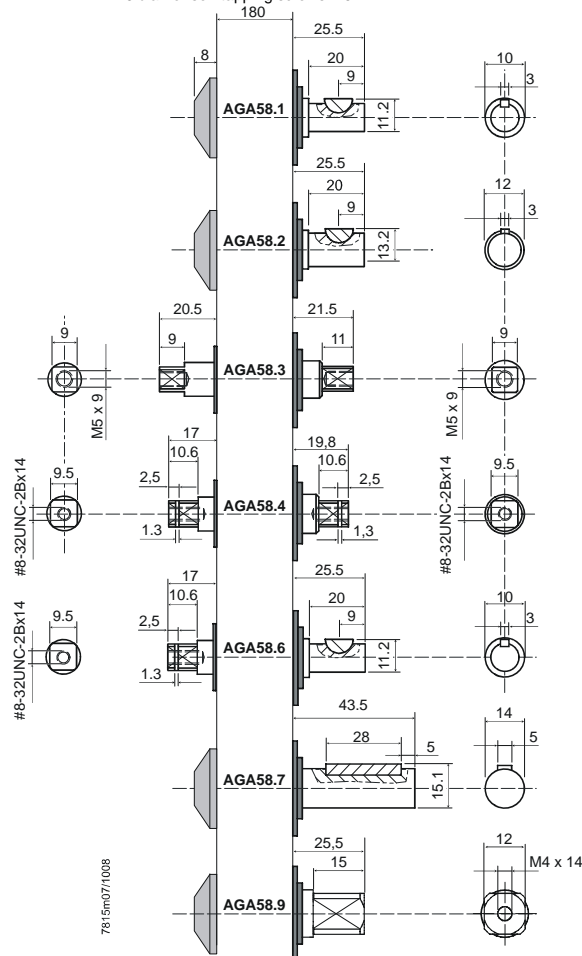
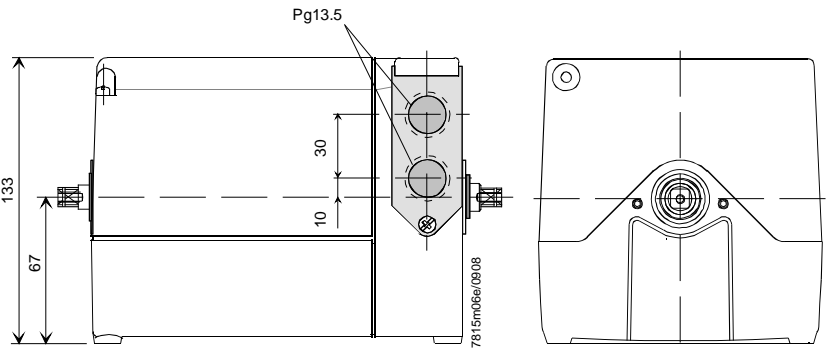
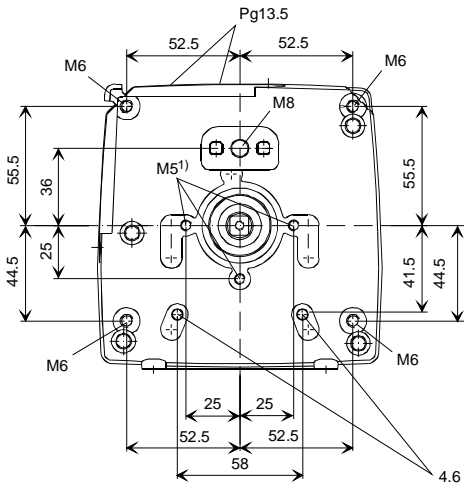
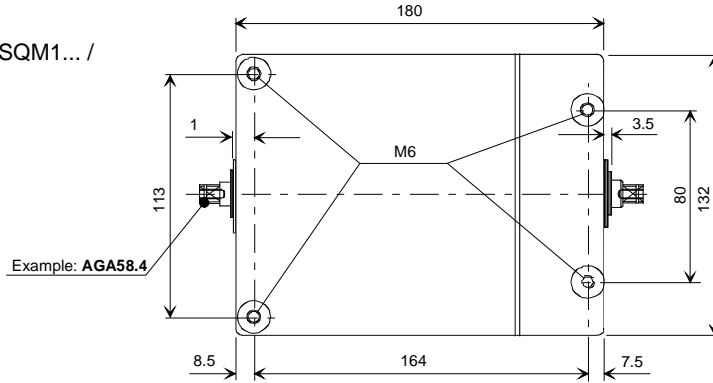
Black scales on the cam shaft, single arrow on the cams.

Dimensions

Dimensions in mm

SQM5...

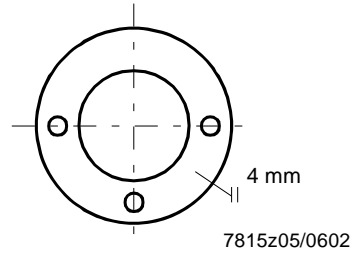
- 1) Identical with fixing points SQM1... / SQM2...



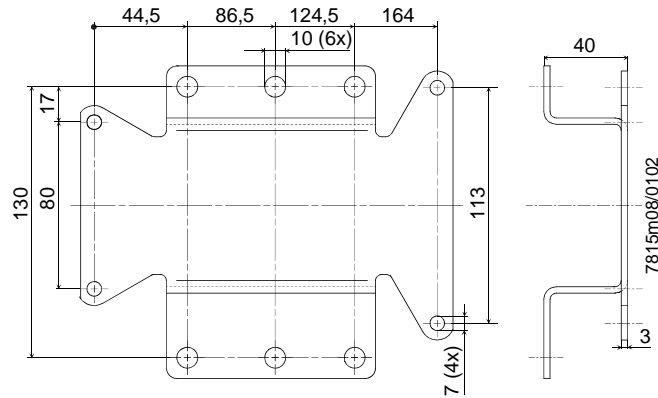
Dimensions (cont'd)

Dimensions in mm

AGA57.1



AGA57.2



AGA57.3

