



## Actuators

for air dampers and control valves of oil burners

**SQM1...**  
**SQM2...**

### Reversible electromotoric actuators

- **Torques:**
  - SQM1... up to 10 Nm
  - SQM2... up to 20 Nm
- **Running times:**
  - SQM1... 14...100 s
  - SQM2... 29...66 s
- **Versions:**
  - Clockwise or counterclockwise rotation

The SQM1/SQM2 and this Data Sheet are intended for use by OEMs which integrate the actuators in their products!

### Use

The reversible actuators of the SQM1/SQM2 range are for use in connection with controllers or switching devices equipped with changeover contacts.

## Warning notes

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**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 and by securing the housing cover
- 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 units must not be put into operation, even if they do not exhibit any damage

## Mounting notes

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- Ensure that the relevant national safety regulations are complied with
- When mounting actuator and damper linkage, the gear train can be disengaged with a lever, thus allowing the actuator's drive shaft to be easily adjusted in either direction of rotation

## Standards and certificates



### Applied directives:

- Low-voltage directive
- Electromagnetic compatibility EMC (immunity)

2014/35/EC

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)

In combination with the burner control

| Type        |  |  |
|-------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| SQM10.15502 | ●                                                                                 | ●                                                                                 |
| SQM10.15561 | ●                                                                                 | ●                                                                                 |
| SQM10.15562 | ●                                                                                 | ●                                                                                 |
| SQM10.16102 | ●                                                                                 | ●                                                                                 |
| SQM10.16501 | ●                                                                                 | ●                                                                                 |
| SQM10.16502 | ●                                                                                 | ●                                                                                 |
| SQM10.16532 | ●                                                                                 | ●                                                                                 |
| SQM10.16561 | ●                                                                                 | ●                                                                                 |
| SQM10.16562 | ●                                                                                 | ●                                                                                 |
| SQM11.15502 | ---                                                                               | ●                                                                                 |
| SQM11.15562 | ---                                                                               | ●                                                                                 |
| SQM11.16502 | ---                                                                               | ●                                                                                 |
| SQM20.16502 | ---                                                                               | ●                                                                                 |
| SQM20.18501 | ---                                                                               | ●                                                                                 |
| SQM20.18502 | ---                                                                               | ●                                                                                 |
| SQM21.16502 | ---                                                                               | ●                                                                                 |
| SQM21.18501 | ---                                                                               | ●                                                                                 |
| SQM21.18502 | ---                                                                               | ●                                                                                 |

## Disposal notes

The SQM1/SQM2 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

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|                                |                                                                                                                                                                                                                                                                                    |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Housing                        | <ul style="list-style-type: none"><li>• The actuator's cover is made of impact-proof and heat-resistant plastic.</li><li>• Color of cover: Dark-grey</li><li>• The housing of the gear train is made of die-cast aluminum and has 4 threaded holes for cable glands Pg11</li></ul> |
| Actuator                       | Reversible, locking-proof synchronous motor.                                                                                                                                                                                                                                       |
| Adjustment of switching points | <ul style="list-style-type: none"><li>• With adjustable cams</li><li>• Setting scales beside the cams give the switching point's angular position</li><li>• Cams can be adjusted manually, either with the enclosed hook spanner or tool</li></ul>                                 |
| Position indicator             | <p>Internally:<br/>Scale at the beginning of the cam stack on the gear train side</p> <p>Only SQM21:<br/>Equipped with position indicator visible from outside (also refer to «Dimensions»)</p>                                                                                    |
| Electrical connections         | Screw terminals.                                                                                                                                                                                                                                                                   |
| Gear train                     | The reduction gearing has self-lubricating sinter-bronze bearings and requires no maintenance.                                                                                                                                                                                     |
| Drive shaft                    | Ready fitted to the front of the gear train.                                                                                                                                                                                                                                       |
| Mounting and fixing            | <ul style="list-style-type: none"><li>• Gear train front is used as the mounting surface</li><li>• Fixing by means of 3 threaded holes with inside thread M5</li></ul>                                                                                                             |

Type summary (Further types on request)

| Running time<br>50 Hz for<br>angular rotation<br>1)                     |      | 3) | Direction of<br>rotation when<br>facing the drive<br>shaft and with<br>control voltage<br>applied to<br>terminal 1 | Number of<br>auxiliary<br>switches | Nominal torque<br>2) | Starting torque | Holding torque | AC 220...240 V<br>4) |                | AC 110 V<br>4)  |                   |
|-------------------------------------------------------------------------|------|----|--------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------|-----------------|----------------|----------------------|----------------|-----------------|-------------------|
|                                                                         |      |    |                                                                                                                    |                                    |                      |                 |                | Article no.          | Type reference | Article no.     | Type<br>reference |
| 90°                                                                     | 130° |    |                                                                                                                    |                                    |                      |                 |                |                      |                |                 |                   |
| Standard version, diameter of drive shaft 10 mm                         |      |    |                                                                                                                    |                                    |                      |                 |                |                      |                |                 |                   |
| 14 s                                                                    | 20 s | 1  | Counterclockwise                                                                                                   | 5                                  | 10 Nm                | 10 Nm           | 4 Nm           | BPZ:SQM10.15502      | SQM10.15502    | ---             | ---               |
| 14 s                                                                    | 20 s | 2  | Counterclockwise                                                                                                   | 5                                  | 10 Nm                | 10 Nm           | 4 Nm           | BPZ:SQM10.15562      | SQM10.15562    | BPZ:SQM10.15561 | SQM10.15561       |
| 29 s                                                                    | 42 s | 1  | Counterclockwise                                                                                                   | 1                                  | 10 Nm                | 15 Nm           | 7 Nm           | BPZ:SQM10.16102      | SQM10.16102    | ---             | ---               |
| 29 s                                                                    | 42 s | 1  | Counterclockwise                                                                                                   | 5                                  | 10 Nm                | 15 Nm           | 7 Nm           | BPZ:SQM10.16502      | SQM10.16502    | BPZ:SQM10.16501 | SQM10.16501       |
| 29 s                                                                    | 42 s | 1  | Counterclockwise                                                                                                   | 5                                  | 10 Nm                | 15 Nm           | 7 Nm           | BPZ:SQM10.16532      | SQM10.16532    | ---             | ---               |
| 29 s                                                                    | 42 s | 2  | Counterclockwise                                                                                                   | 5                                  | 10 Nm                | 15 Nm           | 7 Nm           | BPZ:SQM10.16562      | SQM10.16562    | BPZ:SQM10.16561 | SQM10.16561       |
| 14 s                                                                    | 20 s | 1  | Clockwise                                                                                                          | 5                                  | 10 Nm                | 10 Nm           | 4 Nm           | BPZ:SQM11.15502      | SQM11.15502    | ---             | ---               |
| 14 s                                                                    | 20 s | 2  | Clockwise                                                                                                          | 5                                  | 10 Nm                | 10 Nm           | 4 Nm           | BPZ:SQM11.15562      | SQM11.15562    | ---             | ---               |
| Heavy duty version                                                      |      |    |                                                                                                                    |                                    |                      |                 |                |                      |                |                 |                   |
| Diameter of drive shaft 12 mm                                           |      |    |                                                                                                                    |                                    |                      |                 |                |                      |                |                 |                   |
| Gear train shafts made of hardened steel, gearwheels nitrated           |      |    |                                                                                                                    |                                    |                      |                 |                |                      |                |                 |                   |
| Type SQM21... with external position indication (refer to «Dimensions») |      |    |                                                                                                                    |                                    |                      |                 |                |                      |                |                 |                   |
| 29 s                                                                    | 42 s | 1  | Counterclockwise                                                                                                   | 5                                  | 20 Nm                | 20 Nm           | 12 Nm          | BPZ:SQM20.16502      | SQM20.16502    | ---             | ---               |
| 45 s                                                                    | 66 s | 1  | Counterclockwise                                                                                                   | 5                                  | 20 Nm                | 20 Nm           | 12 Nm          | BPZ:SQM20.18502      | SQM20.18502    | BPZ:SQM20.18501 | SQM20.18501       |
| 29 s                                                                    | 42 s | 1  | Clockwise                                                                                                          | 5                                  | 20 Nm                | 20 Nm           | 12 Nm          | BPZ:SQM21.16502      | SQM21.16502    | ---             | ---               |
| 45 s                                                                    | 66 s | 1  | Clockwise                                                                                                          | 5                                  | 20 Nm                | 20 Nm           | 12 Nm          | BPZ:SQM21.18502      | SQM21.18502    | BPZ:SQM21.18501 | SQM21.18501       |

1) At frequency 60 Hz, running times are about 17 % shorter  
2) Based on 150,000 position changes  
3) Wiring according to diagram no.  
4) Additional types on request

## Ordering

The type reference of the actuator according to the 'Type summary' must be specified when placing an order.

## Technical data

|                          |                                                  |                                                                                                                                 |
|--------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| General actuator data    | Operation voltage                                | AC 220...240 V, 50 Hz -15% / +10%<br>AC 220 V, 60 Hz -15% / +10%<br><br>On request:<br>AC 110 V, 50 / 60 Hz $\pm 6\%$           |
|                          | Switching capacity of end and auxiliary switches | 10 (3) A, AC 24...250 V                                                                                                         |
|                          | Positioning angle                                | Up to 160° (scale range)                                                                                                        |
|                          | Mounting position                                | Optional                                                                                                                        |
|                          | Safety class                                     | I                                                                                                                               |
|                          | Degree of protection                             | IP54 according to EN 60529:1991 + A1:2000 + A2:2013 (at provided design of cable entry or fastening element for not used holes) |
|                          | Cable entry M16 and M20                          | For<br>2 x M16 x 1.5 and<br>2 x M20 x 1.5                                                                                       |
|                          | Weight                                           | Approx. 1.7 kg                                                                                                                  |
|                          | Actuator motor                                   | Synchronous motor                                                                                                               |
|                          | Power consumption                                | 9 VA                                                                                                                            |
|                          | Lifecycle                                        | Cycles (CLOSE $\Rightarrow$ OPEN $\Rightarrow$ CLOSE)<br>with rated torque: typically 250.000                                   |
| Environmental conditions | <b>Storage</b>                                   | EN 60721-3-1:1997                                                                                                               |
|                          | Climatic conditions                              | Class 1K3                                                                                                                       |
|                          | Mechanical conditions                            | Class 1M2                                                                                                                       |
|                          | Temperature range                                | -20...+70 °C                                                                                                                    |
|                          | Humidity                                         | <95% r.h.                                                                                                                       |
|                          | <b>Transport</b>                                 | EN 60721-3-2:1997                                                                                                               |
|                          | Climatic conditions                              | Class 2K2                                                                                                                       |
|                          | Mechanical conditions                            | Class 2M2                                                                                                                       |
|                          | Temperature range                                | -50...+60 °C                                                                                                                    |
|                          | Humidity                                         | <95% r.h.                                                                                                                       |
|                          | <b>Operation</b>                                 | EN 60721-3-3:1995 + A2:1997                                                                                                     |
|                          | Climatic conditions                              | Class 3K5                                                                                                                       |
|                          | Mechanical conditions                            | Class 3M2                                                                                                                       |
|                          | Temperature range (switch on ratio < 0.5)        | -20...+60 °C                                                                                                                    |
|                          | Humidity                                         | <95% r.h.                                                                                                                       |



### Caution!

Condensation, formation of ice and ingress of water are not permitted!  
Failure to observe this information poses a risk of compromising the safety functions and the risk of electric shock.

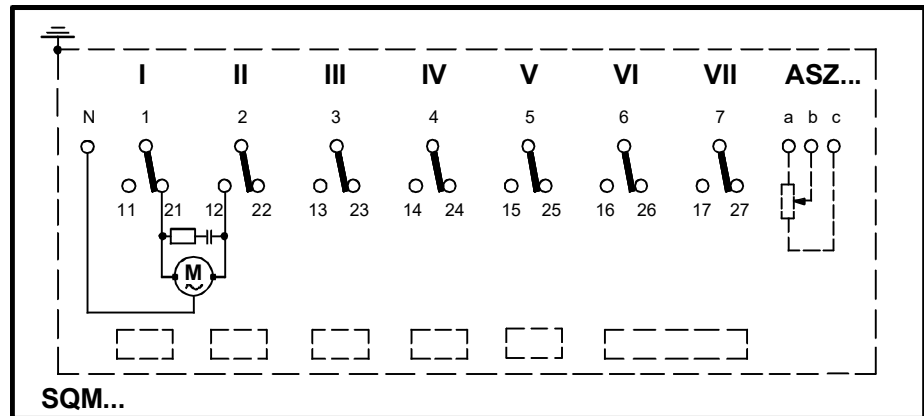
## Function

The synchronous motor drives the shaft via the gear train. Attached to the drive shaft is a cam stack which actuates the end and auxiliary switches. The switching position of each end and auxiliary switch can be adjusted within the operating range with the help of the relevant cams. The control section includes 2 end switches and a maximum of 5 auxiliary switches. In addition, a potentiometer can be integrated (as a feedback potentiometer for P-control, or as a setting unit for slave control, or for remote position indication).

## Connection diagram

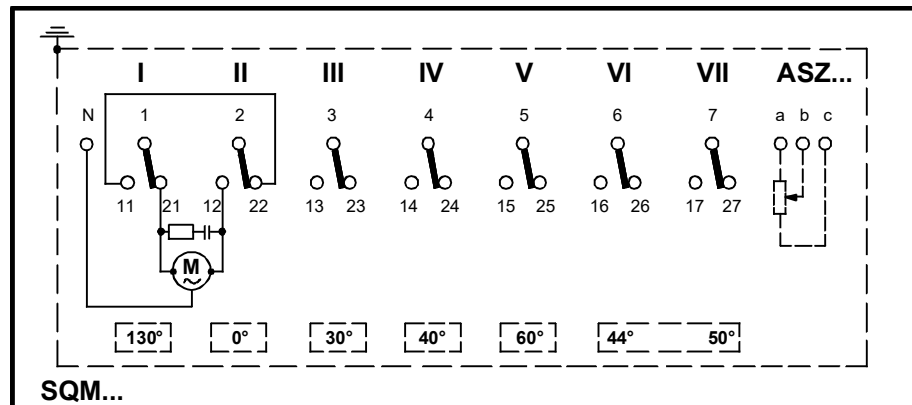
SQM1/SQM2

Diagram no. 1 (H 4 318 1521 0)



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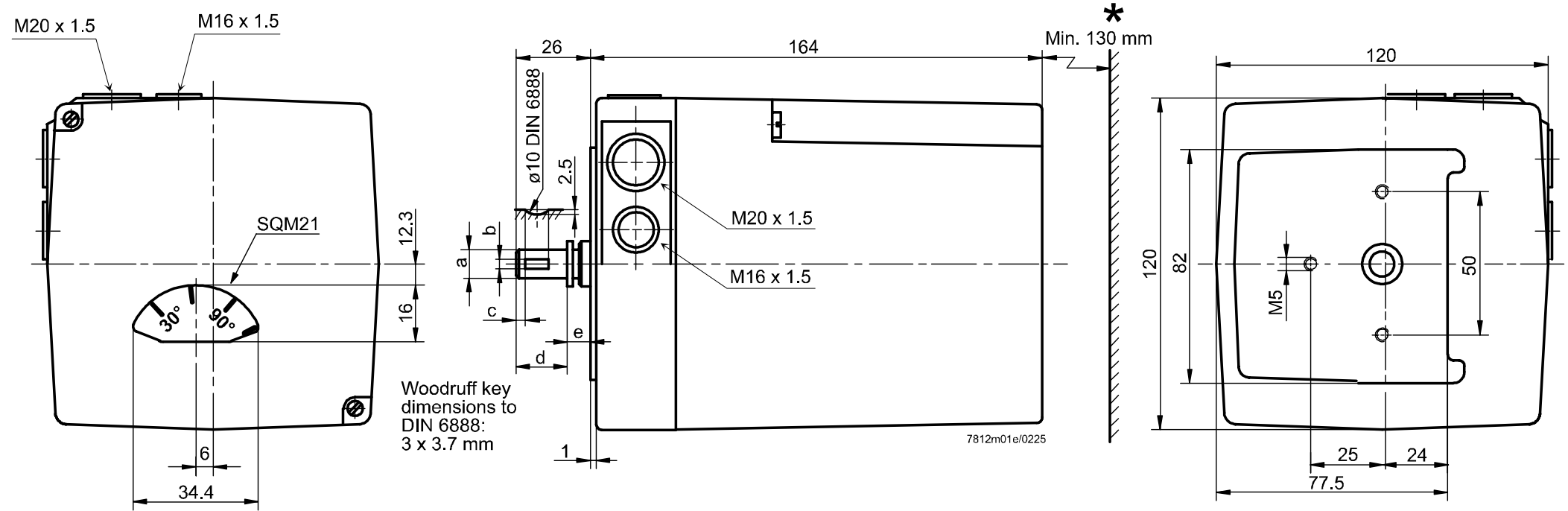
Diagram no. 2 (H 4 318 1522 0)



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## Dimensions

Dimensions in mm



\* For remove the cover required distance to walls, devices of burners etc.

## Dimension table

| Type        | a    | b               | c | d    | e   |
|-------------|------|-----------------|---|------|-----|
| <b>SQM1</b> | 10h8 | 3 <sup>N9</sup> | 4 | 20   | 6   |
| <b>SQM2</b> | 12h8 | 3 <sup>N9</sup> | 4 | 21.5 | 4.5 |

The groove on the drive shaft is in the marked position, when the cam stack of control unit is in the 0° position (as supplied).

