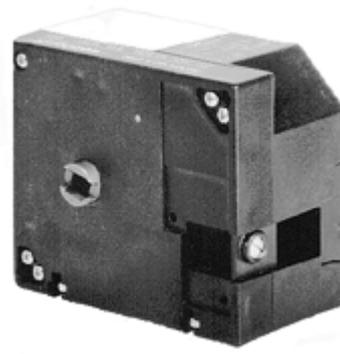


SQN9..., front  
(covers removed)



SQN9..., rear  
(covers fitted)

## Damper Actuators

## SQN9...

Reversible electromotoric actuators for air dampers and valves of oil or gas burners of small to medium capacity.

The SQN9... and this Data Sheet are intended for use by OEMs which integrate the damper actuators in their products!

### Use and features

The SQN9... actuators are designed for driving gas or air dampers of oil or gas burners of small to medium capacity, for load-dependent control of the fuel and combustion air volume:

- In connection with P-PI or PID controllers, such as the RWF40...
  - Directly via the different types of burner controls, such as LOA..., LMO..., LMG..., LFL...
  - In connection with 1- or 2-wire control or 3-position controllers
- All types of actuators feature:
    - Impact-proof and heat-resistant plastic housings
    - Screw terminals for the electrical connections
    - Maintenance-free gear train, which can be disengaged
    - Internal position indication
    - Easy-to-adjust end and auxiliary switches for adjusting the switching points
    - Integrated electronic circuits
  - Holding torque: 0.8...2.4 Nm
  - Running time: 4...24 s
  - Direction of rotation:
 

|          |                  |
|----------|------------------|
| SQN90... | counterclockwise |
| SQN91... | clockwise        |
  - SQN9...
    - Fixing holes and cable entries
    - Equivalent to actuators of the same category made by Conectron and Berger

## Warning notes

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

### **Do not 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 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 actuators 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

## Standards and certificates

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### **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 9001:2008  
ISO 14001:2004  
OHSAS 18001:2007

## Disposal notes

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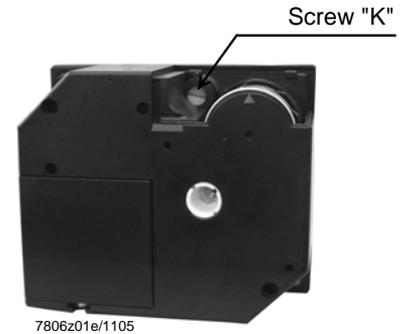


The actuator contains electrical and electronic components and must not be disposed of together with household waste.  
Local and currently valid legislation must be observed.

## Mechanical design

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|                                |   |
|--------------------------------|---|
| Housing                        | <ul style="list-style-type: none"><li>- Made of impact-proof and heat-resistant plastic</li><li>- The housing accommodates:<ul style="list-style-type: none"><li>– The reversible synchronous motor with the gear train, which can be <b>disengaged</b></li><li>– The camshaft of the control section</li><li>– The relays, depending on the type of actuator</li><li>– The switches, connected to the terminals via the printed circuit board</li></ul></li><li>- Color: black</li></ul> |
| Drive motor                    | <ul style="list-style-type: none"><li>- Reversible and locking-proof synchronous motor</li></ul>  |
| Coupling                       | <ul style="list-style-type: none"><li>- Drive shaft can be manually disengaged from the gear train and motor (by pressing screw «K»)</li><li>- Automatic reengagement</li></ul>   |
| Adjustment of switching points | <ul style="list-style-type: none"><li>- By means of adjustable cams</li><li>- Scales beside the cams indicate the angle of the switching points</li><li>- Cams can be adjusted manually or with the enclosed hook-spanner or a similar tool</li></ul>   |
| Position indication            | <ul style="list-style-type: none"><li>- Via scale at the end of the camshaft and index on the front</li></ul>   |
| Electrical connections         | <ul style="list-style-type: none"><li>- Refer to «Technical data»</li></ul>   |
| Gear train                     | <ul style="list-style-type: none"><li>- Maintenance-free</li></ul>  |
| Drive shaft                    | <ul style="list-style-type: none"><li>- Made of sinter metal</li><li>- Ready fitted to the front of the gear train</li></ul>  |
| Mounting and fixing            | <ul style="list-style-type: none"><li>- Rear of the gear train is used as the mounting surface</li><li>- Actuator is secured via through-holes</li><li>- Housing side with recessed fixing nuts M4</li></ul>  |



## Type summary (other types of actuators available on request)

### Actuators SQN90... / counterclockwise rotation <sup>1)</sup>

| Diagram no. | Function sequence no. | Running time at 50 Hz <sup>2)</sup> for 90° s | Nominal / starting torque Nm | Mains voltage / mains frequency                 |   |
|-------------|-----------------------|---|------------------------------|---|---|
|             |                       |   |                              | AC 230 V <sup>4)</sup> +10 % / -15 % 50...60 Hz | AC 115 V <sup>3)</sup> +10 % / -15 % 50...60 Hz |
| S3          | F2, F3                | 12  | 2.4                          | <b>SQN90.204A2799</b>                           | ---   |
| S2          | F2, F3                | 12  | 2.4                          | <b>SQN90.220A2799</b>                           | ---   |
| S4          | F1                    | 12  | 2.4                          | <b>SQN90.240B2799</b>                           | ---   |
| S5          | F4                    | 10  | 2                            | <b>SQN90.350A2799</b>                           | ---   |

### Actuators SQN91... / clockwise rotation <sup>1)</sup>

| Diagram no. | Function sequence no. | Running time at 50 Hz <sup>2)</sup> for 90° s | Nominal / starting torque Nm | Mains voltage / mains frequency                 |   |
|-------------|-----------------------|---|------------------------------|---|---|
|             |                       |   |                              | AC 230 V <sup>4)</sup> +10 % / -15 % 50...60 Hz | AC 115 V <sup>3)</sup> +10 % / -15 % 50...60 Hz |
| S4          | F1                    | 4   | 0.8                          | <b>SQN91.140B2799</b>                           | <b>SQN91.140B1799</b>                           |

Other types of actuators are available on request.

#### Legend

- 1) At 60 Hz, running times are about 20 % shorter
- 2) AC 115 V +10 % / -15 % possible, but in the case of undervoltage, torque is reduced by about 17 %
- 3) AC 230 V +10 % / -15 % possible, but in the case of undervoltage, torque is reduced by about 20 %
- 4) When facing the drive shaft and when control voltage is supplied to end switch I

#### Ordering

When ordering, please give type reference according to «Type summary».

## Technical data

### General unit data

|                                       |  |  |                   |
|---------------------------------------|--|--|-------------------|
| <b>Actuator</b>                       | Mains voltage  | AC 220 V –15 %...AC 240 V +10 %<br>AC 100 V –15 %...AC 110 V +10 %                             |                   |
|                                       | Mains frequency                                      | 50...60 Hz ±6 %  |                   |
|                                       | Primary fuse (external)                              | 6.3 AT (to be supplied by thirds)  |                   |
|                                       | Drive motor  | Synchronous motor  |                   |
|                                       | Power consumption                                    | 8 VA   |                   |
|                                       | Angular adjustment                                   | Max. 90°, scale range 0...90°  |                   |
|                                       | Mounting position                                    | Optional   |                   |
|                                       | Safety class   | II to DIN EN 60730   |                   |
|                                       | Cable connections                                    | Screw terminals for min. 0.5 mm <sup>2</sup> and max. 2.5 mm <sup>2</sup> cross-sectional area |                   |
|                                       | Ferrules   | Matching the dia. of the stranded wire   |                   |
|                                       | Direction of rotation                                | Refer to «Type summary»  |                   |
|                                       | Nominal torque                                       | Refer to «Type summary»  |                   |
|                                       | Running time   | Refer to «Type summary»  |                   |
|                                       | Load changes with continuous rated load              | Typically 500,000  |                   |
|                                       | Weight (average)                                     | Approx. 550 g  |                   |
| <b>End and auxiliary switches</b>     | Number of end switches                               | 2  |                   |
|                                       | Number of auxiliary switches                         | Max. 3   |                   |
|                                       | Actuation  | Via camshaft   |                   |
|                                       | Breaking voltage                                     | AC 24...250 V  |                   |
|                                       | Adjustment of cams                                   | Infinitely   |                   |
|                                       | Perm. load on terminals at cos φ = 0.9:<br>Switching | Peak current   | Operating current |
| - Under load «On», without load «Off» | Max. 14 A  | 2 A  |                   |
| - Under load «On», under load «Off»   | Max. 7 A   | 1 A  |                   |
| <b>Environmental conditions</b>       | <b>Storage</b>                                       | DIN EN 60721-3-1   |                   |
|                                       | Climatic conditions                                  | Class 1K3  |                   |
|                                       | Mechanical conditions                                | Class 1M2  |                   |
|                                       | Temperature range                                    | -20...+60 °C   |                   |
|                                       | Humidity   | <95 % r.h.   |                   |
|                                       | <b>Transport</b>                                     | DIN EN 60721-3-2   |                   |
|                                       | Climatic conditions                                  | Class 2K2  |                   |
|                                       | Mechanical conditions                                | Class 2M2  |                   |
|                                       | Temperature range                                    | -50...+60 °C   |                   |
|                                       | Humidity   | <95 % r.h.   |                   |
|                                       | <b>Operation</b>                                     | DIN EN 60721-3-3   |                   |
|                                       | Climatic conditions                                  | Class 3K5  |                   |
| Mechanical conditions                 | Class 3M2  |  |                   |
| Temperature range                     | -20...+60 °C   |  |                   |
| Humidity                              | <95 % r.h.   |  |                   |



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

### Function

A synchronous motor drives the drive shaft and the camshaft via a gear train. The camshaft actuates the end and auxiliary switches. Using the associated cam, the switching position of each end and auxiliary switch can be adjusted within the working range. Some of the actuator versions are equipped with electronic modules, which perform auxiliary functions in connection with the end and auxiliary switches, or with external devices, such as controllers.

## Camshaft

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The camshaft has 2 pointers for indicating the direction of rotation.

The pointers are assigned as follows:

- Double pointer → SQN90...
- Single pointer → SQN91...



## Internal diagrams



### Note!

- The following connection diagrams show the start position as supplied:
- End switch position II «Closed»
  - Dead

Diagram S1

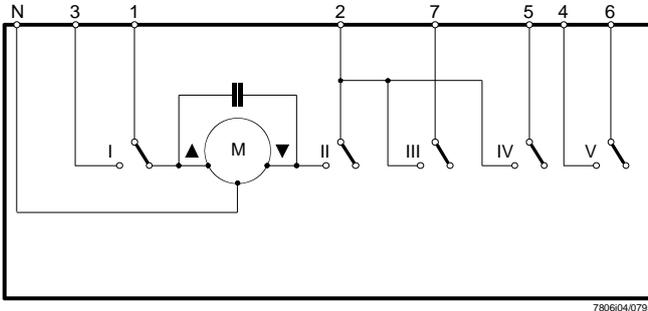


Diagram S2

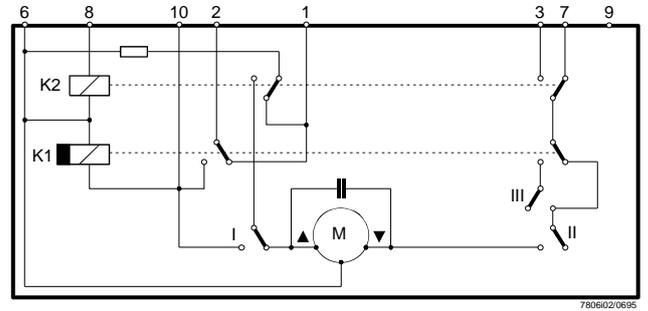


Diagram S3

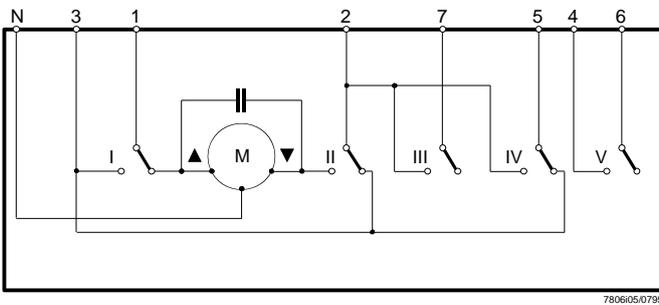


Diagram S4

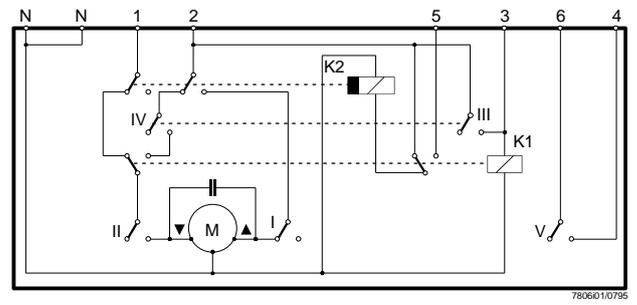
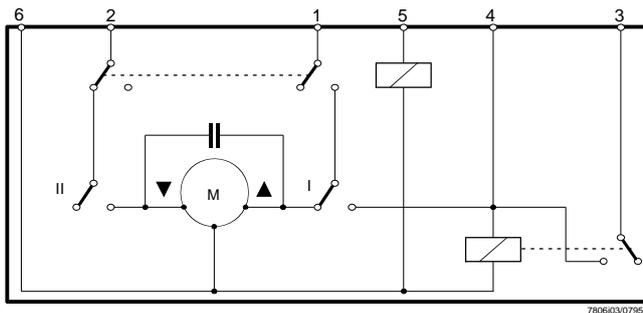
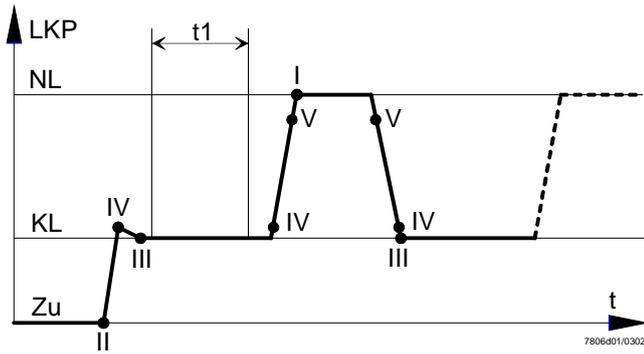


Diagram S5

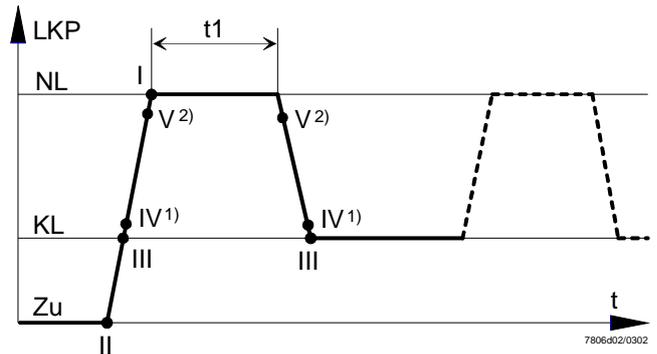


## Function sequence

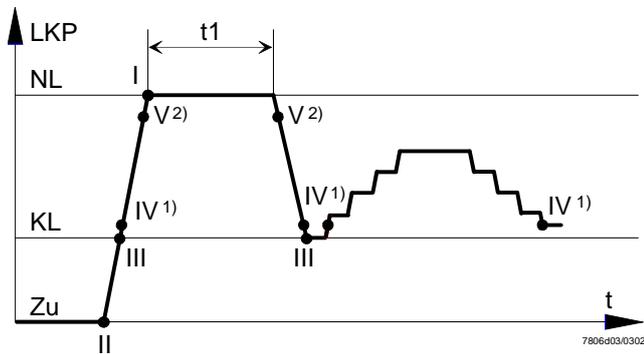
Function sequence F1



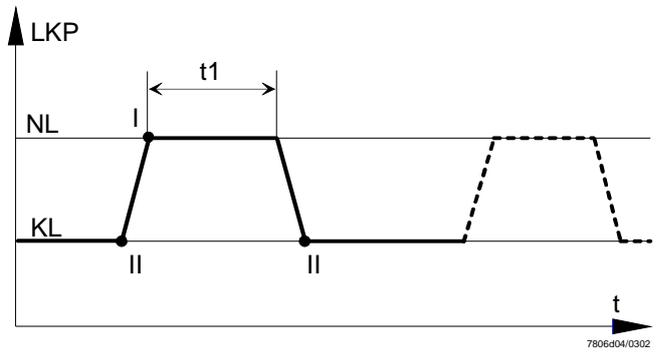
Function sequence F2



Function sequence F3



Function sequence F4



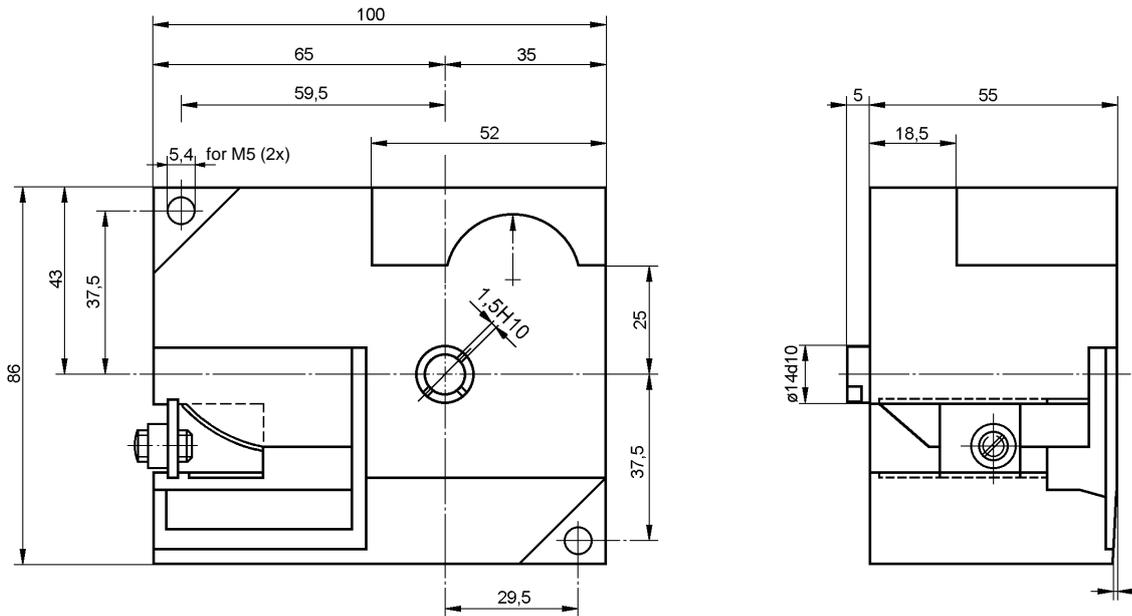
### Legend

- KL Low-fire
- LKP Air damper position
- NL High-fire
- t Time
- t<sub>1</sub> Burner control's prepurge time
- I...V Cam switches or auxiliary switches
- 1) Cam switch positions do not apply to internal diagram S2
- 2) Cam switch positions do not apply to internal diagram S2 and S7

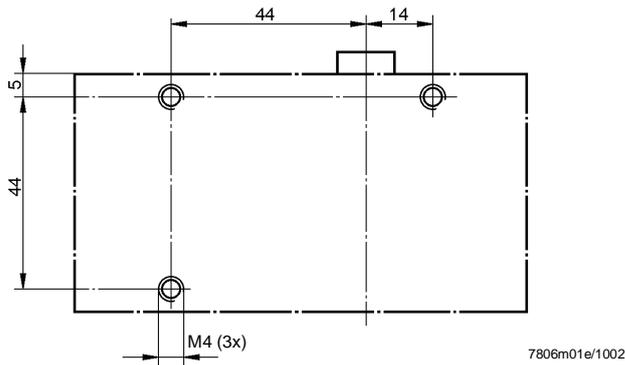
**Dimensions**

Dimensions in mm

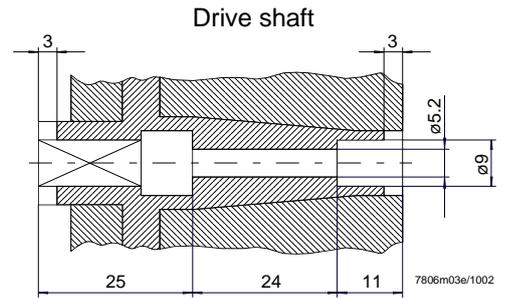
Drawing shows actuator with terminal cover removed



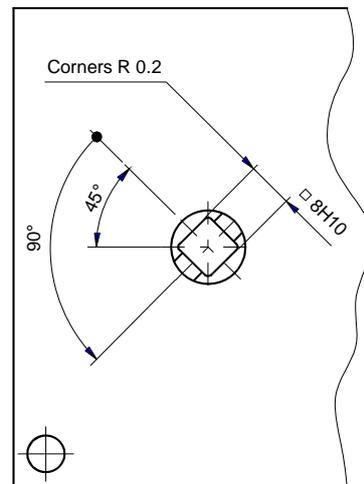
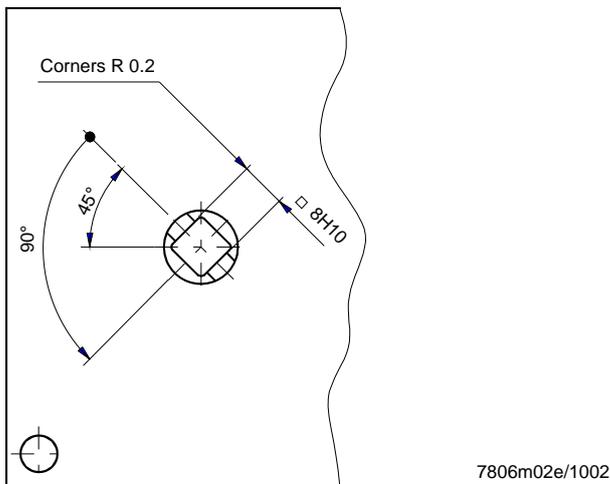
Schematic drawing



SQN90...



SQN91...



Drive shafts shown in «fully closed» position (end switch II)