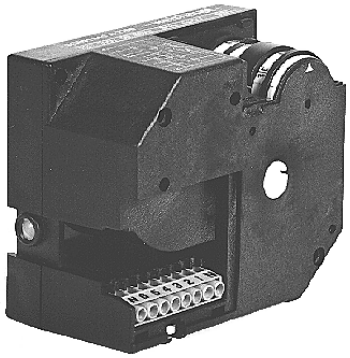
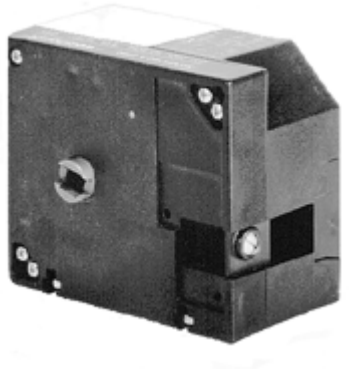


SQN9..., front
(covers removed)



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

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

- Ensure that the relevant national safety regulations are complied with

Standards and certificates

Conformity to EEC directives

- Electromagnetic compatibility EMC (immunity)	2004/108/EC
- Low-voltage directive	2006/95/EC

ISO 9001: 2000
Cert. 00739

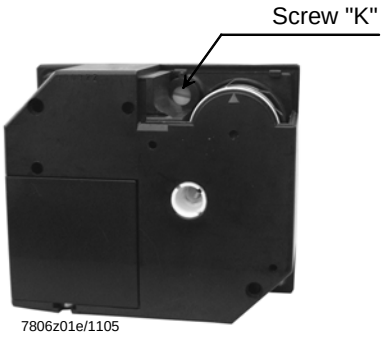
ISO 14001: 2004
Cert. 38233

Disposal notes

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

Housing	-	Made of impact-proof and heat-resistant plastic
	-	The housing accommodates: – The reversible synchronous motor with the gear train, which can be **disengaged** – The camshaft of the control section – The relays, depending on the type of actuator – The switches, connected to the terminals via the printed circuit board
	-	Color: black
Drive motor	-	Reversible and locking-proof synchronous motor
Coupling	-	Drive shaft can be manually disengaged from the gear train and motor (by pressing screw «K»)
	-	Automatic reengagement



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Adjustment of switching points	-	By means of adjustable cams
	-	Scales beside the cams indicate the angle of the switching points
	-	Cams can be adjusted manually or with the enclosed hook-spanner or a similar tool
Position indication	-	Via scale at the end of the camshaft and index on the front
Electrical connections	-	Refer to «Technical data»
Gear train	-	Maintenance-free
Drive shaft	-	Made of sinter metal
	-	Ready fitted to the front of the gear train
Mounting and fixing	-	Rear of the gear train is used as the mounting surface
	-	Actuator is secured via through-holes
	-	Housing side with recessed fixing nuts M4

Type summary (other types of actuators available on request)

Actuators SQN90… / counterclockwise rotation [1])

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

Actuators SQN91… / clockwise rotation [1])

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

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

Actuator	Mains voltage	AC 220 V –15 %...AC 240 V +10 % 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 mm² and max. 2.5 mm² 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	
End and auxiliary switches	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:	Peak current	Operating current
	Switching		
	- Under load «On», without load «Off»	Max. 14 A	2 A
	- Under load «On», under load «Off»	Max. 7 A	1 A
Environmental conditions	**Storage**	DIN EN 60721-3-1	
	Climatic conditions	Class 1K3	
	Mechanical conditions	Class 1M2	
	Temperature range	-20...+60 °C	
	Humidity	<95 % r.h.	
	Transport	DIN EN 60721-3-2	
	Climatic conditions	Class 2K2	
	Mechanical conditions	Class 2M2	
	Temperature range	-50...+60 °C	
	Humidity	<95 % r.h.	
	Operation	DIN EN 60721-3-3	
	Climatic conditions	Class 3K5	
	Mechanical conditions	Class 3M2	
	Temperature range	-20...+60 °C	
	Humidity	<95 % r.h.	

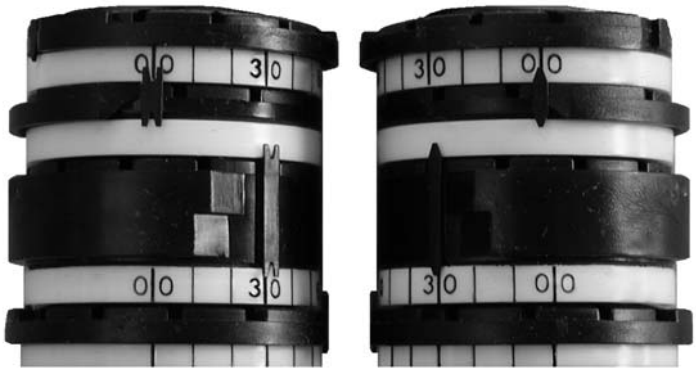
Caution!
Condensation, formation of ice and ingress of water are not permitted!

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.

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

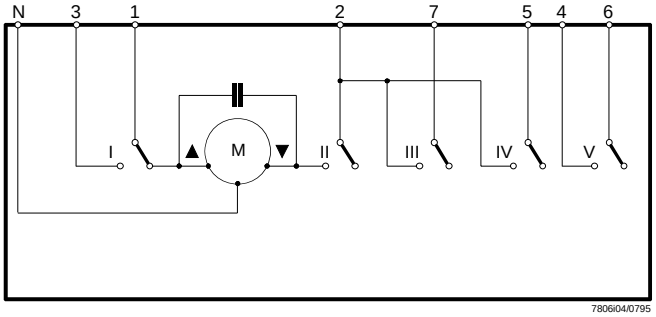


Diagram S2

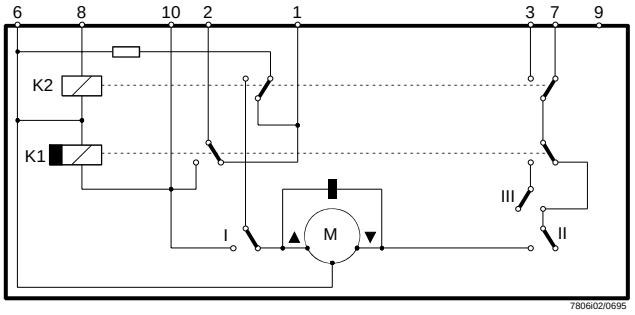


Diagram S3

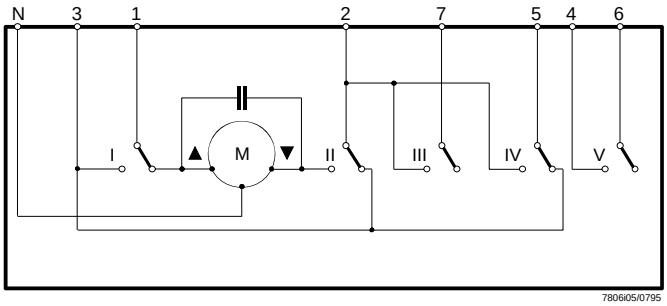


Diagram S4

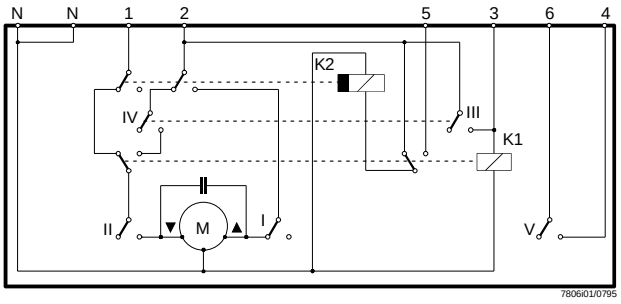
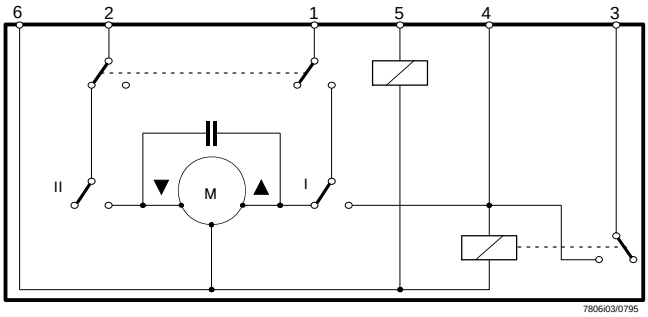
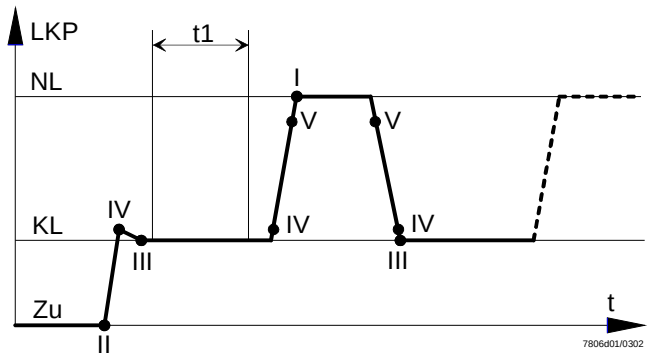


Diagram S5

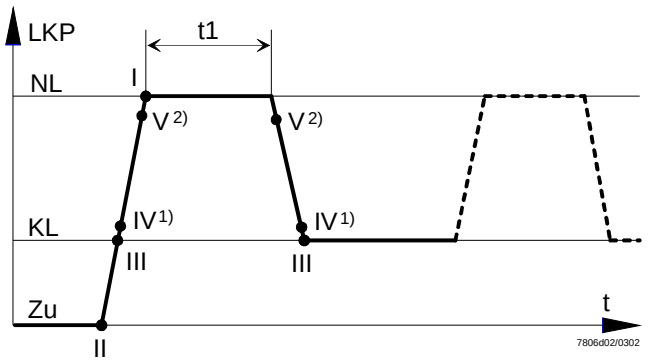


Function sequence

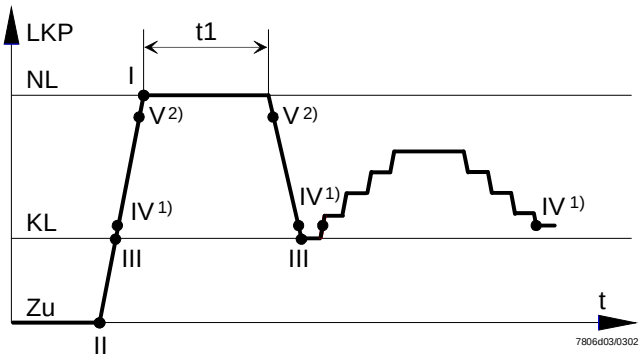
Function sequence F1



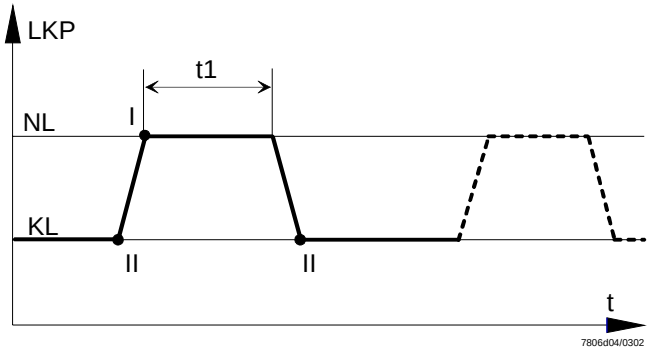
Function sequence F2



Function sequence F3



Function sequence F4



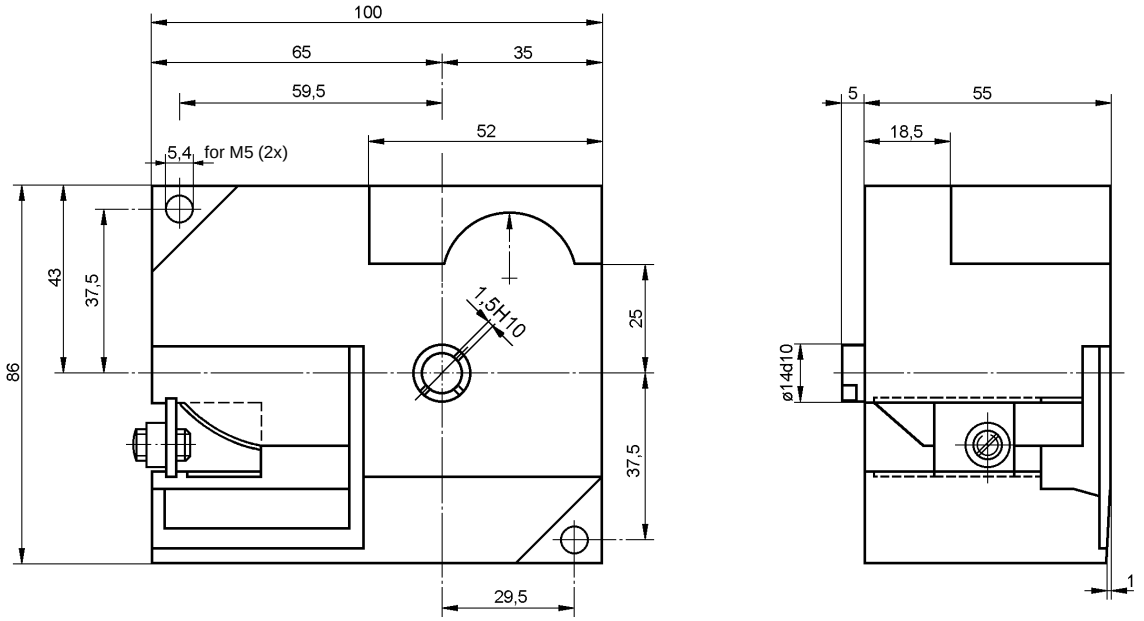
Legend

KL	Low-fire
LKP	Air damper position
NL	High-fire
t	Time
t1	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

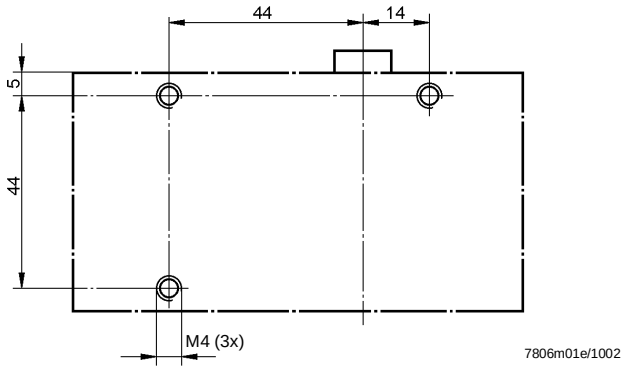
Dimensions

Dimensions in mm

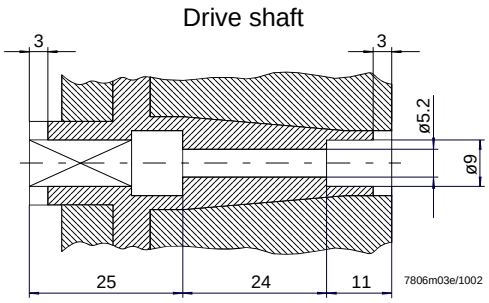
Drawing shows actuator with terminal cover removed



Schematic drawing

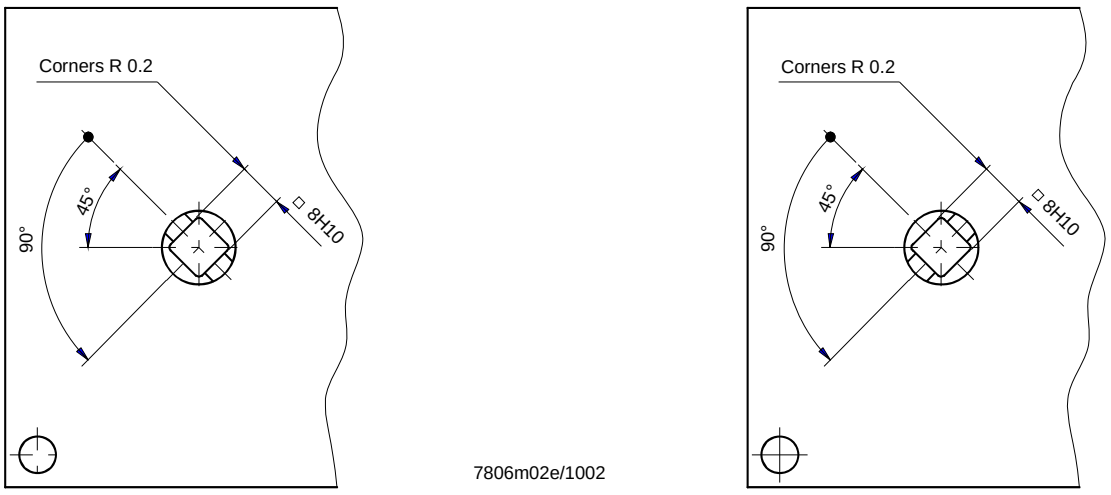


Drive shaft



SQN90...

SQN91...



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