



Actuator SQM40.../SQM41...

Actuators for air and gas dampers

**SQM40...
SQM41...**

-
- Electromotoric actuator up to 18 Nm torque
 - Clockwise and counterclockwise variants
 - Running times from 5 up to 65 seconds
 - Different shaft ends available
 - Electronic version with analog control input
 - Internal position indication
 - Drive shaft can be disengaged
 - Variants with UL and CSA approval, as well as GL marine approval

The SQM40.../SQM41... and this Data Sheet are intended for use by OEMs which integrate the actuators in their products!

Use

The SQM40.../SQM41... actuators are suited for driving oil pressure controller, butterfly valves, dampers or for use on other applications that require rotary motion. Areas of application are oil and gas burners of medium to higher capacity as well as thermal process plants.

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

- 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 |
|---------------------|-----------------------|-----------------------|
| SQM45... / SQM48... | Data Sheet | N7814 |
| SQM10... / SQM20... | Data Sheet | N7812 |
| ASZ... | Data Sheet | N7921 |
| ASZ22.3x | Mounting Instruction | 74 319 0921 0 (M7921) |

Warning notes



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

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

- Read the documentation on the actuators carefully and fully. If not observed, dangerous situations might occur
- The user must ensure that the actuators meet the requirements of the relevant application standards
- Safety-related applications are only available with Siemens burner controls!
- All product-related activities (mounting, settings and maintenance) must be performed by qualified and authorized personnel



Caution!

- Risk of electric shock hazard – to disconnect the actuator from power, it may be necessary to open more than one switch. Before performing maintenance work, the actuator must be disconnected from power
 - The electrical connection between the conduit fittings is not made automatically. It must be established on 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 provide protection against electric shock hazard, the connecting terminals must have adequate touch 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 actuator's electronic components when touched.

Recommendation: Use ESD equipment

Notes on use in North America

- Use of flexible conduit including adequate accessories is mandatory
- Use of copper wiring is mandatory
- All circuits of class 2 must use cables type CL3, CL3R, CL3P or comparable types, OR
All circuits are wired according to class 1 (electrical light or power circuits)

Mounting notes

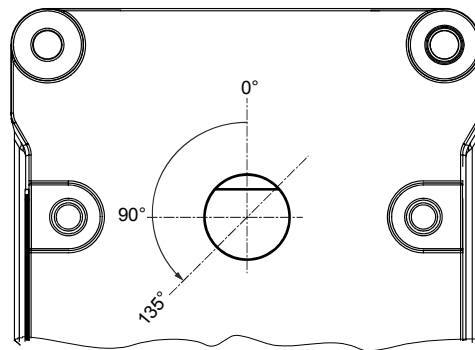
- Ensure that the relevant national safety regulations and notes on standards are complied with
- In geographical areas where DIN regulations apply, the mounting and installation requirements of VDE must be satisfied, especially DIN/VDE 0100, 0550 and DIN/VDE 0722
- Make certain that the actuator is not exposed to direct solar radiation
- Required tightening torques for the fixing screws of the
 - housing cover: 3.5 Nm
 - connecting cover: 2 Nm



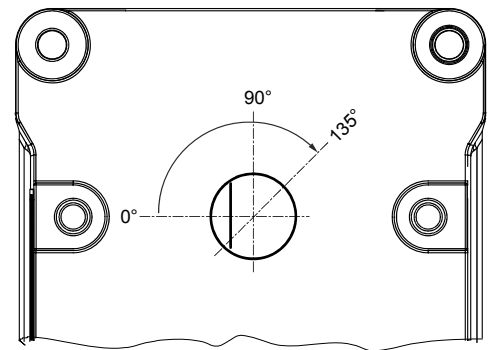
Note!

Ensure correct direction of rotation!

SQM40... (left, CCW)



SQM41... (right, CW)



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Installation notes

- Ensure that the electrical wiring is in compliance with national and local safety regulation
- Make certain that strain relief of the connected cables conforms to the relevant standards (e.g. as per DIN EN 60730 and DIN EN 60335)
- Ensure that spliced wires cannot get into contact with neighboring terminals. Use adequate ferrules
- Unused terminals of the SQM40.../SQM41... must be covered by dummy plugs
- When making the wiring, the AC 120 V or AC 230 V section must be separated from other voltage sections, thus ensuring protection against electric shock hazard
- 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

Electrical connection

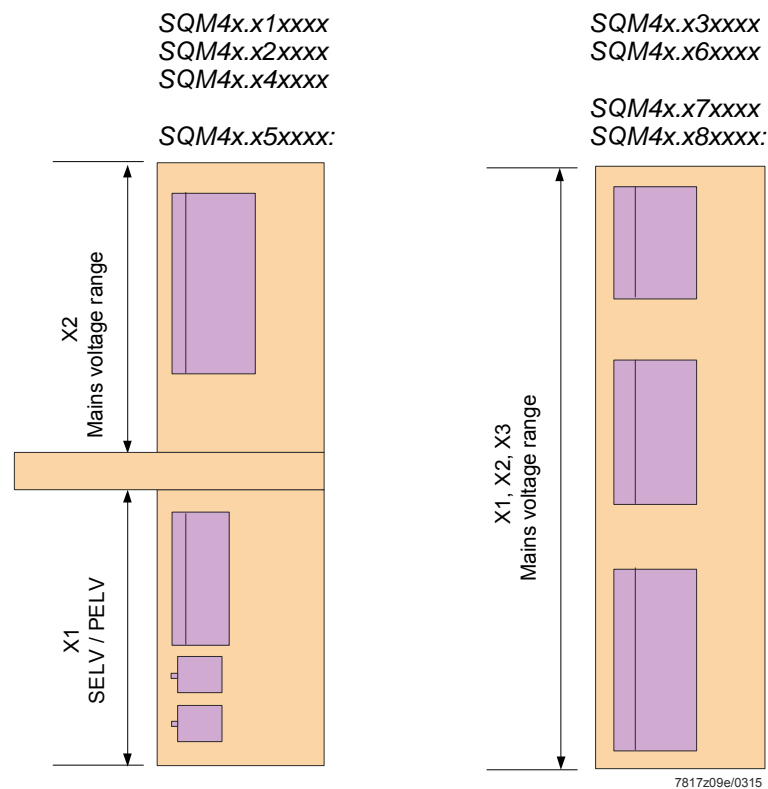
- The actuators must always be powered via a prefuse of max. 6.3 AT (as per DIN EN 6012- 2/5)
- For the protective earth connection, the housing of all variants has a marked **PE** connecting terminal. A tightening torque of 1.2 Nm must be observed for fitting the screw
- The supplied RAST3.5 connectors or RAST5 connectors must be used with screw terminals for electrical connections. A tightening torque of 0.25 Nm must be observed for fitting the screw



Note!

The connection of fuel valves is only permitted on fused output terminals, see chapter *Connection diagrams*. For this purpose, specific unit variants are available fitted with a unit-internal, non-replaceable fuse. The unit-internal fuse is used to protect each switching contact from welding in the event of external short-circuit. In addition, please note that the maximum current load for the fused output terminals is reduced, see chapter *Connection diagrams*.

Marking of the SQM40... / SQM41... connection areas:



Note

SELV or PELV depends on the safety class of the connected components. In the case of PELV, the relevant component is connected to protective earth.

Cam settings

The mechanical setting facility for the cams is physically separated from the connection terminals. When the actuator is disconnected from power, the switches can be adjusted via a scale. The cams can be changed via adjusting screws. The scale indicates the angles of the switching points.

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



EAC Conformity mark (Eurasian Conformity mark)



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



For types marked with **R**
Example: SQM40.264**R**10

For use in US/Canada where the power supply lines require a connection facility for flexible conduit, the actuator's product no. includes type suffix «R» (see following example). These products are **UL**-listed.



For types marked with **36** or **38**
Examples: SQM4x.36x**A**2x, SQM4x.38x**A**2x
For marine applications, environmental category A.

Lifetime

The actuator has a designed lifetime* of 250,000 start cycles (close ⇒ open ⇒ close) 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 usage (starting from the date of manufacture on the device type plate). This lifetime is based on the endurance tests specified in standard EN 298.

A summary of the conditions has been published by the European Control Manufacturers Association (Afecor - www.afecor.org).

The designed 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 startup cycles, or the respective time of usage time, the actuator is to be replaced by authorized personnel.

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

Disposal notes

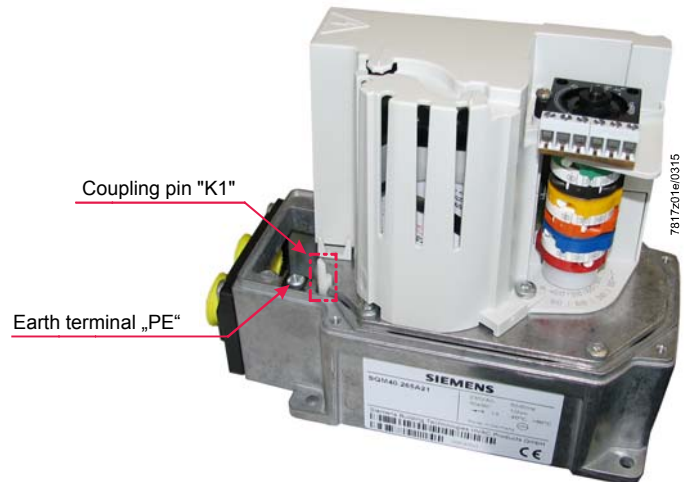


The unit contains electrical and electronic components and must not be disposed of together with domestic waste.

Local and currently valid legislation must be observed.

Mechanical design

| | |
|-------------|--|
| Housing | <ul style="list-style-type: none"> • Lower housing part made of die-cast aluminum • Housing cover made of impact-proof and heat-resistant plastic |
| Drive motor | <ul style="list-style-type: none"> • Synchronous motor |
| Coupling | <ul style="list-style-type: none"> • Shaft can be manually disengaged from the motor by operating the coupling (coupling pin (K1)) • Automatic reengagement <p>Disengagement of drive shaft / motor by pressing coupling pin «K1»</p> |



| | |
|--------------------------------|---|
| Earthing connection | <ul style="list-style-type: none"> • Earth terminal (PE) with screw fitting |
| Cam shaft drive | <ul style="list-style-type: none"> • Non-reactive gear |
| Adjustment of switching points | <ul style="list-style-type: none"> • With adjustable cams • Scales beside the cams indicate the angle of the switching point |
| Position indicator | <ul style="list-style-type: none"> • Internally <ul style="list-style-type: none"> – Scale 0...135° at the end of the cam assembly – Scale range to direction of rotation with arrow marking for SQM41 or with marking in slot die for SQM40 |
| Electrical connections | <ul style="list-style-type: none"> • RAST3.5 screw terminals are factory supplied, depending on the PCB variant • RAST5 screw terminals are factory supplied, depending on the PCB variant • Optional: Insulation displacement connectors • Cable entry by means of 2 openings in the connector cover supplied. The cable glands are not included in the scope of delivery • Large openings in the housing allow easy cable installation |
| Gear train | Maintenance-free gearwheels and bearings. |
| Drive shaft | <ul style="list-style-type: none"> • Different shaft versions available, shafts are supplied assembled • Drive shaft is not replaceable |
| Actuator fixing | Mounting holes on the lower side of the housing (shaft side), such as actuators SQM45... / SQM48... using M5 screws, or alternatively as actuators SQM10... / SQM20... front mounting using M5 self-tapping screws (see chapter <i>Dimensions</i>). |

Type summary (other types on request)

| Article no. | Type | Direction of rotation | | Torque ¹⁾ / running time ¹⁾ for 90° | PCB | | | | | | Shaft no. | Regional version | | Operating voltage | | Potentiometer | |
|------------------|--------------|-----------------------|-----------|--|--------------------------------|----------------------------|------------|------------|-----------------|--------------|-----------|------------------|-------------|-------------------|--------|---------------|-------------|
| | | Counter-clockwise | Clockwise | | Electronic version Diagram no. | Switch version Diagram no. | 3-position | 2-position | No. of switches | No. of relay | | EU | US / Canada | AC120V | AC230V | Double 90° | Double 135° |
| BPZ:SQM40.025A21 | SQM40.025A21 | ● | | 2,5 Nm / 5 s | 2 | | | | 4 | | 5 | ● | | | ● | ● | |
| BPZ:SQM40.065A23 | SQM40.065A23 | ● | | 2,5 Nm / 5 s | | 6 | ● | | 6 | | 5 | ● | | | ● | | ● |
| BPZ:SQM40.115R11 | SQM40.115R11 | ● | | 5 Nm / 15 s | 1 | | | | 3 | | 5 | | ● | ● | | ● | |
| BPZ:SQM40.115R13 | SQM40.115R13 | ● | | 5 Nm / 15 s | 1 | | | | 3 | | 5 | | ● | ● | | | ● |
| BPZ:SQM40.141A21 | SQM40.141A21 | ● | | 5 Nm / 15 s | 4 | | | | 3 | | 1 | ● | | | ● | ● | |
| BPZ:SQM40.144R11 | SQM40.144R11 | ● | | 5 Nm / 15 s | 4 | | | | 3 | | 4 | | ● | ● | | ● | |
| BPZ:SQM40.145A21 | SQM40.145A21 | ● | | 5 Nm / 15 s | 4 | | | | 3 | | 5 | ● | | | ● | ● | |
| BPZ:SQM40.145R11 | SQM40.145R11 | ● | | 5 Nm / 15 s | 4 | | | | 3 | | 5 | | ● | ● | | ● | |
| BPZ:SQM40.155R11 | SQM40.155R11 | ● | | 5 Nm / 15 s | 5 | | | | 4 | | 5 | | ● | ● | | ● | |
| BPZ:SQM40.155R13 | SQM40.155R13 | ● | | 5 Nm / 15 s | 5 | | | | 4 | | 5 | | ● | ● | | | ● |
| BPZ:SQM40.161A20 | SQM40.161A20 | ● | | 5 Nm / 15 s | | 6 | ● | | 6 | | 1 | ● | | | ● | | |
| BPZ:SQM40.165A20 | SQM40.165A20 | ● | | 5 Nm / 15 s | | 6 | ● | | 6 | | 5 | ● | | | ● | | |
| BPZ:SQM40.165A21 | SQM40.165A21 | ● | | 5 Nm / 15 s | | 6 | ● | | 6 | | 5 | ● | | | ● | ● | |
| BPZ:SQM40.165R11 | SQM40.165R11 | ● | | 5 Nm / 15 s | | 6 | ● | | 6 | | 5 | | ● | ● | | ● | |
| BPZ:SQM40.171A20 | SQM40.171A20 | ● | | 5 Nm / 15 s | | 7 | | ● | 5 | 1 | 1 | ● | | | ● | | |
| BPZ:SQM40.175A21 | SQM40.175A21 | ● | | 5 Nm / 15 s | | 7 | | ● | 5 | 1 | 5 | ● | | | ● | ● | |

Type summary (other types on request) (cont'd)

| Article no. | Type | Direction of rotation | | Torque ¹⁾ / running time ¹⁾ for 90° | PCB | | | | | | Shaft no. | Regional version | | Operating voltage | | Potentiometer | |
|------------------|--------------|-----------------------|-----------|--|--------------------------------|----------------------------|------------|------------|-----------------|--------------|-----------|------------------|-------------|-------------------|--------|---------------|-------------|
| | | Counter-clockwise | Clockwise | | Electronic version Diagram no. | Switch version Diagram no. | 3-position | 2-position | No. of switches | No. of relay | | EU | US / Canada | AC120V | AC230V | Double 90° | Double 135° |
| BPZ:SQM40.185R11 | SQM40.185R11 | ● | | 5 Nm / 15 s | | 8 | ● | | 6 | | 5 | | ● | ● | | ● | |
| BPZ:SQM40.215R11 | SQM40.215R11 | ● | | 10 Nm / 30 s | 1 | | | | 3 | | 5 | | ● | ● | | ● | |
| BPZ:SQM40.215R13 | SQM40.215R13 | ● | | 10 Nm / 30 s | 1 | | | | 3 | | 5 | | ● | ● | | | ● |
| BPZ:SQM40.235A20 | SQM40.235A20 | ● | | 10 Nm / 30 s | | 3 | | ● | 4 | 3 | 5 | ● | | | ● | | |
| BPZ:SQM40.241A21 | SQM40.241A21 | ● | | 10 Nm / 30 s | 4 | | | | 3 | | 1 | ● | | | ● | ● | |
| BPZ:SQM40.241R11 | SQM40.241R11 | ● | | 10 Nm / 30 s | 4 | | | | 3 | | 1 | | ● | ● | | ● | |
| BPZ:SQM40.244A21 | SQM40.244A21 | ● | | 10 Nm / 30 s | 4 | | | | 3 | | 4 | ● | | | ● | ● | |
| BPZ:SQM40.244R11 | SQM40.244R11 | ● | | 10 Nm / 30 s | 4 | | | | 3 | | 4 | | ● | ● | | ● | |
| BPZ:SQM40.245A11 | SQM40.245A11 | ● | | 10 Nm / 30 s | 4 | | | | 3 | | 5 | ● | | ● | | ● | |
| BPZ:SQM40.245A21 | SQM40.245A21 | ● | | 10 Nm / 30 s | 4 | | | | 3 | | 5 | ● | | | ● | ● | |
| BPZ:SQM40.245R11 | SQM40.245R11 | ● | | 10 Nm / 30 s | 4 | | | | 3 | | 5 | | ● | ● | | ● | |
| BPZ:SQM40.247A21 | SQM40.247A21 | ● | | 10 Nm / 30 s | 4 | | | | 3 | | 7 | ● | | | ● | ● | |
| BPZ:SQM40.255A21 | SQM40.255A21 | ● | | 10 Nm / 30 s | 5 | | | | 4 | | 5 | ● | | | ● | ● | |
| BPZ:SQM40.255R11 | SQM40.255R11 | ● | | 10 Nm / 30 s | 5 | | | | 4 | | 5 | | ● | ● | | ● | |
| BPZ:SQM40.255R13 | SQM40.255R13 | ● | | 10 Nm / 30 s | 5 | | | | 4 | | 5 | | ● | ● | | | ● |
| BPZ:SQM40.261A11 | SQM40.261A11 | ● | | 10 Nm / 30 s | | 6 | ● | | 6 | | 1 | ● | | ● | | ● | |
| BPZ:SQM40.261A20 | SQM40.261A20 | ● | | 10 Nm / 30 s | | 6 | ● | | 6 | | 1 | ● | | | ● | | |
| BPZ:SQM40.261A21 | SQM40.261A21 | ● | | 10 Nm / 30 s | | 6 | ● | | 6 | | 1 | ● | | | ● | ● | |
| BPZ:SQM40.261R11 | SQM40.261R11 | ● | | 10 Nm / 30 s | | 6 | ● | | 6 | | 1 | | ● | ● | | ● | |

Type summary (other types on request) (cont'd)

| Article no. | Type | Direction of rotation | | Torque ¹⁾ / running time ¹⁾ for 90° | PCB | | | | | | Shaft no. | Regional version | | Operating voltage | | Potentiometer | |
|------------------|--------------|-----------------------|-----------|--|--------------------------------|----------------------------|------------|------------|-----------------|--------------|-----------|------------------|-------------|-------------------|--------|---------------|-------------|
| | | Counter-clockwise | Clockwise | | Electronic version Diagram no. | Switch version Diagram no. | 3-position | 2-position | No. of switches | No. of relay | | EU | US / Canada | AC120V | AC230V | Double 90° | Double 135° |
| BPZ:SQM40.265A11 | SQM40.265A11 | ● | | 10 Nm / 30 s | | 6 | ● | | 6 | | 5 | ● | | ● | | ● | |
| BPZ:SQM40.265A20 | SQM40.265A20 | ● | | 10 Nm / 30 s | | 6 | ● | | 6 | | 5 | ● | | | ● | | |
| BPZ:SQM40.265A21 | SQM40.265A21 | ● | | 10 Nm / 30 s | | 6 | ● | | 6 | | 5 | ● | | | ● | ● | |
| BPZ:SQM40.265R11 | SQM40.265R11 | ● | | 10 Nm / 30 s | | 6 | ● | | 6 | | 5 | | ● | ● | | ● | |
| BPZ:SQM40.267A20 | SQM40.267A20 | ● | | 10 Nm / 30 s | | 6 | ● | | 6 | | 7 | ● | | | ● | | |
| BPZ:SQM40.271A20 | SQM40.271A20 | ● | | 10 Nm / 30 s | | 7 | | ● | 5 | 1 | 1 | ● | | | ● | | |
| BPZ:SQM40.274R10 | SQM40.274R10 | ● | | 10 Nm / 30 s | | 7 | | ● | 5 | 1 | 4 | | ● | ● | | | |
| BPZ:SQM40.275A20 | SQM40.275A20 | ● | | 10 Nm / 30 s | | 7 | | ● | 5 | 1 | 5 | ● | | | ● | | |
| BPZ:SQM40.275A21 | SQM40.275A21 | ● | | 10 Nm / 30 s | | 7 | | ● | 5 | 1 | 5 | ● | | | ● | ● | |
| BPZ:SQM40.275R10 | SQM40.275R10 | ● | | 10 Nm / 30 s | | 7 | | ● | 5 | 1 | 5 | | ● | ● | | | |
| BPZ:SQM40.281A20 | SQM40.281A20 | ● | | 10 Nm / 30 s | | 8 | ● | | 6 | | 1 | ● | | | ● | | |
| BPZ:SQM40.285R11 | SQM40.285R11 | ● | | 10 Nm / 30 s | | 8 | ● | | 6 | | 5 | | ● | ● | | ● | |
| BPZ:SQM40.317A23 | SQM40.317A23 | ● | | 18 Nm / 65 s | 1 | | | | 3 | | 7 | ● | | | ● | | ● |
| BPZ:SQM40.317R11 | SQM40.317R11 | ● | | 18 Nm / 65 s | 1 | | | | 3 | | 7 | | ● | ● | | ● | |
| BPZ:SQM40.317R13 | SQM40.317R13 | ● | | 18 Nm / 65 s | 1 | | | | 3 | | 7 | | ● | ● | | | ● |
| BPZ:SQM40.357R11 | SQM40.357R11 | ● | | 18 Nm / 65 s | 5 | | | | 4 | | 7 | | ● | ● | | ● | |
| BPZ:SQM40.357R13 | SQM40.357R13 | ● | | 18 Nm / 65 s | 5 | | | | 4 | | 7 | | ● | ● | | ● | |
| S55452-D301-A100 | SQM40.367A10 | ● | | 18 Nm / 65 s | | 6 | ● | | 6 | | 7 | ● | | ● | | | |
| BPZ:SQM40.387A20 | SQM40.387A20 | ● | | 18 Nm / 65 s | | 8 | ● | | 6 | | 7 | ● | | | ● | | |
| BPZ:SQM40.387A23 | SQM40.387A23 | ● | | 18 Nm / 65 s | | 8 | ● | | 6 | | 7 | ● | | | ● | | ● |

Type summary (other types on request) (cont'd)

| Article no. | Type | Direction of rotation | | Torque ¹⁾ / running time ¹⁾ for 90° | PCB | | | | | | Shaft no. | Regional version | | Operating voltage | | Potentiometer | |
|------------------|--------------|-----------------------|-----------|--|--------------------------------|----------------------------|------------|------------|-----------------|--------------|-----------|------------------|-------------|-------------------|--------|---------------|-------------|
| | | Counter-clockwise | Clockwise | | Electronic version Diagram no. | Switch version Diagram no. | 3-position | 2-position | No. of switches | No. of relay | | EU | US / Canada | AC120V | AC230V | Double 90° | Double 135° |
| BPZ:SQM40.387R11 | SQM40.387R11 | ● | | 18 Nm / 65 s | | 8 | ● | | 6 | | 7 | | ● | ● | | ● | |
| BPZ:SQM41.141A21 | SQM41.141A21 | | ● | 5 Nm / 15 s | 4 | | | | 3 | | 1 | ● | | | ● | ● | |
| BPZ:SQM41.145A21 | SQM41.145A21 | | ● | 5 Nm / 15 s | 4 | | | | 3 | | 5 | ● | | | ● | ● | |
| BPZ:SQM41.161A20 | SQM41.161A20 | | ● | 5 Nm / 15 s | | 6 | ● | | 6 | | 1 | ● | | | ● | | |
| BPZ:SQM41.165R11 | SQM41.165R11 | | ● | 5 Nm / 15 s | | 6 | ● | | 6 | | 5 | | ● | ● | | ● | |
| BPZ:SQM41.185R11 | SQM41.185R11 | | ● | 5 Nm / 15 s | | 8 | ● | | 6 | | 5 | | ● | ● | | ● | |
| BPZ:SQM41.241A11 | SQM41.241A11 | | ● | 10 Nm / 30 s | 4 | | | | 3 | | 1 | ● | | ● | | ● | |
| BPZ:SQM41.241A21 | SQM41.241A21 | | ● | 10 Nm / 30 s | 4 | | | | 3 | | 1 | ● | | | ● | ● | |
| BPZ:SQM41.241R11 | SQM41.241R11 | | ● | 10 Nm / 30 s | 4 | | | | 3 | | 1 | | ● | ● | | ● | |
| BPZ:SQM41.244A21 | SQM41.244A21 | | ● | 10 Nm / 30 s | 4 | | | | 3 | | 4 | ● | | | ● | ● | |
| BPZ:SQM41.244R11 | SQM41.244R11 | | ● | 10 Nm / 30 s | 4 | | | | 3 | | 4 | | ● | ● | | ● | |
| BPZ:SQM41.245A11 | SQM41.245A11 | | ● | 10 Nm / 30 s | 4 | | | | 3 | | 5 | ● | | ● | | ● | |
| BPZ:SQM41.245A21 | SQM41.245A21 | | ● | 10 Nm / 30 s | 4 | | | | 3 | | 5 | ● | | | ● | ● | |
| BPZ:SQM41.245R11 | SQM41.245R11 | | ● | 10 Nm / 30 s | 4 | | | | 3 | | 5 | | ● | ● | | ● | |

Type summary (other types on request) (cont'd)

| Article no. | Type | Direction of rotation | | Torque ¹⁾ / running time ¹⁾ for 90° | PCB | | | | | | Shaft no. | Regional version | | Operating voltage | | Potentiometer | |
|------------------|--------------|-----------------------|-----------|--|--------------------------------|----------------------------|------------|------------|-----------------|--------------|-----------|------------------|-------------|-------------------|--------|---------------|-------------|
| | | Counter-clockwise | Clockwise | | Electronic version Diagram no. | Switch version Diagram no. | 3-position | 2-position | No. of switches | No. of relay | | EU | US / Canada | AC120V | AC230V | Double 90° | Double 135° |
| BPZ:SQM41.254R11 | SQM41.254R11 | | ● | 10 Nm / 30 s | 5 | | | | 4 | | 4 | | ● | ● | | ● | |
| BPZ:SQM41.261A11 | SQM41.261A11 | | ● | 10 Nm / 30 s | | | 6 | ● | | 6 | | 1 | ● | | ● | | ● |
| BPZ:SQM41.261A21 | SQM41.261A21 | | ● | 10 Nm / 30 s | | | 6 | ● | | 6 | | 1 | ● | | ● | | ● |
| BPZ:SQM41.261R11 | SQM41.261R11 | | ● | 10 Nm / 30 s | | | 6 | ● | | 6 | | 1 | | ● | ● | | ● |
| BPZ:SQM41.264A21 | SQM41.264A21 | | ● | 10 Nm / 30 s | | | 6 | ● | | 6 | | 4 | ● | | ● | | ● |
| BPZ:SQM41.264R11 | SQM41.264R11 | | ● | 10 Nm / 30 s | | | 6 | ● | | 6 | | 4 | | ● | ● | | ● |
| BPZ:SQM41.265R11 | SQM41.265R11 | | ● | 10 Nm / 30 s | | | 6 | ● | | 6 | | 5 | | ● | ● | | ● |
| BPZ:SQM41.267A21 | SQM41.267A21 | | ● | 10 Nm / 30 s | | | 6 | ● | | 6 | | 7 | ● | | ● | | ● |
| BPZ:SQM41.271R10 | SQM41.271R10 | | ● | 10 Nm / 30 s | | | 7 | | ● | 5 | 1 | 1 | | ● | ● | | |
| BPZ:SQM41.275A21 | SQM41.275A21 | | ● | 10 Nm / 30 s | | | 7 | | ● | 5 | 1 | 5 | ● | | ● | | ● |
| BPZ:SQM41.275R10 | SQM41.275R10 | | ● | 10 Nm / 30 s | | | 7 | | ● | 5 | 1 | 5 | | ● | ● | | |
| BPZ:SQM41.285R11 | SQM41.285R11 | | ● | 10 Nm / 30 s | | | 8 | ● | | 6 | | 5 | | ● | ● | | ● |
| BPZ:SQM41.357A23 | SQM41.357A23 | | ● | 18 Nm / 65 s | 5 | | | | | 4 | | 7 | ● | | ● | | ● |
| BPZ:SQM41.357R11 | SQM41.357R11 | | ● | 18 Nm / 65 s | 5 | | | | | 4 | | 7 | | ● | ● | | ● |
| BPZ:SQM41.367A21 | SQM41.367A21 | | ● | 18 Nm / 65 s | | | 6 | ● | | 6 | | 7 | ● | | ● | | ● |
| BPZ:SQM41.387R11 | SQM41.387R11 | | ● | 18 Nm / 65 s | | | 8 | ● | | 6 | | 7 | | ● | ● | | ● |

1) Specifications apply to ambient temperatures of 23 °C and a mains voltage of AC 120 V or AC 230 V and a mains frequency of 50 Hz. With a mains frequency of 60 Hz, the running times are approx. 17% shorter. Torques lower by the same rate.

Type summary (cont'd) (other types on request) (cont'd)



Note

Not all types of actuators are available ex stock. Additional versions are available on request.

Drive shafts:

| Type of drive shaft | Max. torque | Shaft no. |
|---|-------------|-----------|
| Ø 10 mm, woodruff key as per DIN 6888 | 10 Nm | 1 |
| □ 9.5 mm, square shaft | 15 Nm | 4 |
| Ø 10 mm D type shaft, compatible with SQM45... | 10 Nm | 5 |
| Ø 14 mm with parallel key as per DIN 6885, compatible with SQM48... | 20 Nm | 7 |

Accessories must be ordered as separate items:



Mounting plate

ASK33.1

For mounting the SQM40... / SQM41... onto the VKP... proportional controlling element

See Mounting Instruction 74 319 0843 0 (M7646)



Mounting kit

ASK33.4

For fitting SQM40... / SQM41... to the butterfly valve VKF41.xxC

See Mounting Instruction 74 319 0916 0 (M7813 / 7814)



Front cover (on request)

For making the connections for the power supply lines

- For 1/2" NPT protective sleeve
- For metric cable gland

AGA45.11

AGA45.12



Note!

Front covers AGA45.11 and AGA45.12 are only to be used as replacements. The corresponding AGA45... version is factory-prefitted onto the SQM40... / SQM41...



Connector sets (on request)

With screw terminals for replacement:

- For SQM4x.x1xxxx
- For SQM4x.x4xxxx
- For SQM4x.x2xxxx, SQM4x.x5xxxx
- For SQM4x.x3xxxx, SQM4x.x6xxxx, SQM4x.x7xxxx, SQM4x.x8xxxx

AGA45.1

AGA45.4

AGA45.5

AGA45.6



Potentiometers (on request)

For retrofitting

- For SQM40... / SQM41...: Double potentiometer 2*1000 Ω, 90°
- For SQM40...: Double potentiometer 2*1000 Ω, 135°
- For SQM41...: Double potentiometer 2*1000 Ω, 135°

ASZ22.32

ASZ22.35

ASZ22.34

Refer to Data Sheet N7921.



Note!

ASZ22... potentiometers are only intended for the retrofitting onto SQM40... / SQM41... types with the end number 0 (SQM4x.xxxx0).


For all SQM40... / SQM41... types with the end number 1 (SQM4x.xxxx1) or 3 (SQM4x.xxxx3), the potentiometers are already factory installed.

Technical Data

| | | |
|--|--|---|
| General unit data | Operating voltage | |
| | - SQM4x.xxxA1... | AC 120 V -15%/+10% |
| | - SQM4x.xxxA2... | AC 230 V -15%/+10% |
| | - SQM4x.xxxR1... | AC 120 V -15%/+10% |
| | Operating frequency | 50...60 Hz \pm 6% |
| | Drive motor | Synchronous motor |
| | Power consumption | 10 VA |
| | Operating angle | Between 0° and max. 90° or between 0° and max. 135°, depending on the type |
| | Mounting position | Optional |
| | Degree of protection | IP66 |
| | Safety class | I |
| | External overload fuse | Max. 6.3 AT (slow) to DIN EN 60127-2/5 |
| | Internal overload fuse | 2 AT (slow), depending on the type, non-exchangeable |
| | Cable entry | 2 x M16 without thread or 2 x 1/2" NPT thread, depending on the type |
| | Wire cross-sectional area of the connecting wires, including earth terminal (PE) | 0.5...2.5 mm ² |
| | Direction of rotation | Facing the shaft end (mounting surface): |
| | • SQM40... | Counterclockwise (CCW) |
| | • SQM41... | Clockwise (CW) |
| | Torque | 2.5 Nm / 5 Nm / 10 Nm / 18 Nm, depending on type ¹⁾ |
| | Torque tolerance | -25% |
| | Holding torque | Each valid at the tolerance limits of temperature and operating voltage 50% Of the torque for types with 5 Nm, 10 Nm, and 18 Nm torque 36% Of the torque for types with 2.5 Nm torque |
| | Running time | 5 s, 15 s, 30 s and 65 s, depending on type ¹⁾ |
| | Running time tolerance | +10% |
| | Pause time at change in direction of rotation, zero-current state | >100 ms |
| | End and auxiliary switches | |
| | • Type | To DIN 41636 |
| | • Switching voltage | AC 24...250 V |
| • Switching capacity | See specifications in chapter <i>Connection diagrams</i> | |
| Number of end switches | 2 | |
| Number of auxiliary switches | Max. 4, depending on type | |
| Drive shaft | Supplied as standard, non-exchangeable | |
| Weight | Approx. 2 kg | |
| Temperature of the mounting surface | Max. 60 °C | |
| Rated surge voltage | Overvoltage category III in accordance with DIN EN 60730-1 chapter 20 | |
| Backlash between the actuator motor and actuator shaft | | |
| - ex works | <1° | |
| - after 250,000 cycles | <1.2° | |

- 1) Specifications apply to ambient temperatures of 23 °C and a mains voltage of AC 120 V or AC 230 V and a mains frequency of 50 Hz. With a mains frequency of 60 Hz, the running times are approx. 17% shorter. The torques lower by the same rate

Technical Data (cont'd)

| | | |
|---------------------------|---|---|
| | Lifetime | 250,000 start cycles (close ⇒ open ⇒ close) 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° |
| Analog inputs | General | |
| | Linearity | <5% of the control range |
| | Control range | 0...90° or 0...135°, depending on type |
| | Voltage setpoint | |
| | X1-1 (U-IN), X1-2 (GND) | DC 2...10 V |
| | - Umin | DC 2 V |
| | - Umax | DC 10 V |
| | Input impedance | ≥5 kΩ |
| | Current setpoint | |
| | X1-3 (I-IN), X1-2 (GND) | DC 4...20 mA |
| | - Imin | DC 4 mA |
| | - Imax | DC 20 mA |
| | Input impedance | ≤500 Ω |
| Impedance setpoint | | |
| X1-4, X1-5, X1-6 (GND) | 0...135 Ω | |
| - RNominal | 135 Ω ±5% | |
| For use in North America | Cross-sectional area of the power supply lines | |
| | SQM4x.x1xxxx / SQM4x.x4xxxx / SQM4x.x5xxxx, (X2), (PE) | Class 1, min. AWG 16 Suited for 105 °C |
| | SQM4x.x6xxxx / SQM4x.x7xxxx / SQM4x.x8xxxx, (X1)/(X2)/(X3), (PE) | Max. 2.5 mm ² or AWG 14 |
| | SQM4x.x1xxxx / SQM4x.x2xxxx / SQM4x.x4xxxx / SQM4x.x5xxxx (X1) | Class 2, min. AWG 22 Suited for 105 °C Max. 1 mm ² or AWG 18 |
| | NEMA classification | NEMA4 (in progress) |
| | Outdoor use | |
| |  | Attention! Waterproof cable conduits and cable glands are required (e.g. type DWTT/7 or QCRV2/8) |
| | | |
| | | |
| | | |
| Environmental conditions | Storage | |
| | Storage | DIN EN 60721-3-1 |
| | Climatic conditions | Class 1K3 |
| | Mechanical conditions | Class 1M2 |
| | Temperature range | -20...60 °C |
| | Humidity | <95% r.h. |
| | Transport | |
| | Transport | DIN EN 60721-3-2 |
| | Climatic conditions | Class 2K3 |
| | Mechanical conditions | Class 2M2 |
| | Temperature range | -20...60 °C |
| | Humidity | <95% r.h. |
| | Operation | |
| | Operation | DIN EN 60721-3-3 |
| | Climatic conditions | Class 3K5 |
| | Mechanical conditions | Class 3M4 |
| | Temperature range | -20...60 °C |
| | | -15...+60 °C for 18 Nm design |
| Humidity | <95% r.h. | |



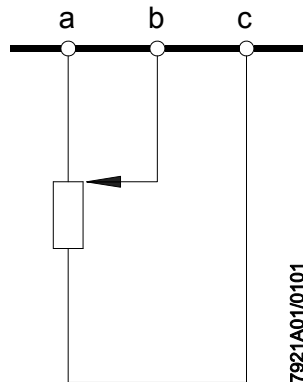
Notice!

Condensation, formation of ice, and ingress of water are not permitted. If this is not observed, there is a risk of loss of safety functions and a risk of electric shock.

Technical Data (cont'd)

| | | |
|----------------------------------|---|---|
| Conductive plastic potentiometer | Resistance | 2*1000 Ω double potentiometer with separated resistance tracks |
| | Operating voltage | DC 10 V |
| | Permissible hysteresis | 0.3% of 90° or of 135°, depending on type |
| | Total resistance tolerance | $\pm 20\%$ |
| | Effective angular rotation | 90° or 135°, depending on type |
| | Terminal strip | Triple-pole |
| | For cross-sectional areas of | 0.5...1 mm ² |
| | Wiper current rating | Max. 100 μ A |
| | Transfer resistance of wiper contact | Max. $R_{ü} \leq 100 \Omega$ |
| | Linearity (referred to $R_{ges} = 1000 \Omega$) | $\pm 1\%$ |
| | Smoothness ($\alpha = 10^\circ$) / microlinearity | <0.5% |
| | Life cycle | Approx. 2 million positioning cycles |
| | Temperature coefficient | 0.4 Ω /K |

Conductive plastic potentiometer connection diagram



Potentiometer drawn in start position (as supplied).

Terminal markings:
a = high end of potentiometer
b = potentiometer wiper
c = low end of potentiometer

Apply operating voltage only on terminals «a» and «c». Conductive plastic potentiometers can be destroyed if operating voltage is applied incorrectly between «a → b» or «b → c».

The polarity of the potentiometer end pickups «a → c» must be observed in order to achieve the correct signal direction to the potentiometer wiper «b».

If the potentiometer specified for 90° is operated outside of the effective range of angular rotation of 90°, no valid signal will be present at the wiper contact (interrupted circuit). This can happen if the switch position of the switching cam I for high-fire is configured for over 90°.

The 90° version ASZ22.32 can be used for both directions of rotation, SQM40... (counterclockwise) and SQM41... (clockwise).

The 135° versions ASZ22.34 and ASZ22.35 are each intended for a particular direction of rotation.

The direction of rotation of the potentiometer must correspond with the direction of rotation of the actuator as follows:

- ASZ22.34 can only be used with SQM41... (clockwise)
- ASZ22.35 can only be used with SQM40... (counterclockwise)

Connection diagrams and connection terminals

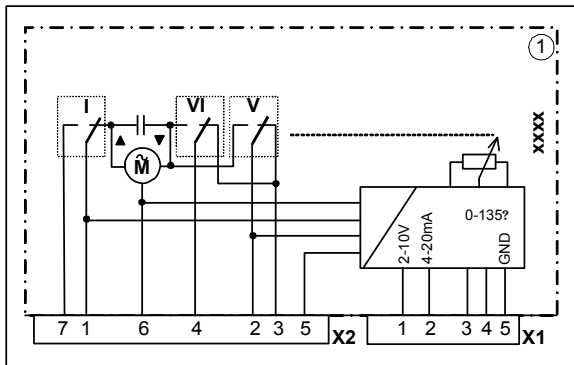
SQM4x.x1xxxx

Electronic version



Note!

For the sake of clarity, the plug-in contacts do not appear in sequential order in the circuit diagram. Consecutive numbers are printed on the unit, however, e.g. 1...7.



| Mains voltage terminals | | | Dimensioning |
|-------------------------|-------------------------------|--------|--|
| X1-1 | 2...10 V | Input | max. DC 10 V to X1-5 |
| X1-2 | 4...20 mA | Input | max. 20 mA to X1-5 |
| X1-3 | 0...135 Ω 1 | Input | |
| X1-4 | 0...135 Ω 2 | Input | |
| X1-5 | 0...135 Ω 3 (GND) | Input | |
| X2-1 | Open (I) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ * |
| X2-2 | Move to low-fire (V) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ * |
| X2-3 | Low-fire position reached (V) | Output | AC 120 V / AC 230 V max. 10 mA, $\cos\phi > 0.9$ |
| X2-4 | Close / ignition (VI) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X2-5 | Controller release | Input | AC 120 V / AC 230 V max. 60 mA / 30 mA |
| X2-6 | Neutral | Input | AC 120 V / AC 230 V max. 60 mA / 30 mA |
| X2-7 | Open position reached (I) | Output | AC 120 V / AC 230 V max. 10 mA, $\cos\phi > 0.9$ |

| Mains voltage terminals | | | Dimensioning |
|-------------------------|-------------------------------|--------|--|
| X2-1 | Open (I) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ * |
| X2-2 | Move to low-fire (V) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ * |
| X2-3 | Low-fire position reached (V) | Output | AC 120 V / AC 230 V max. 10 mA, $\cos\phi > 0.9$ |
| X2-4 | Close / ignition (VI) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X2-5 | Controller release | Input | AC 120 V / AC 230 V max. 60 mA / 30 mA |
| X2-6 | Neutral | Input | AC 120 V / AC 230 V max. 60 mA / 30 mA |
| X2-7 | Open position reached (I) | Output | AC 120 V / AC 230 V max. 10 mA, $\cos\phi > 0.9$ |

* Only the control lines to the burner controls or to the control unit may be connected at the marked terminals.

It is not permitted to connect additional external loads, such as signal lamps.

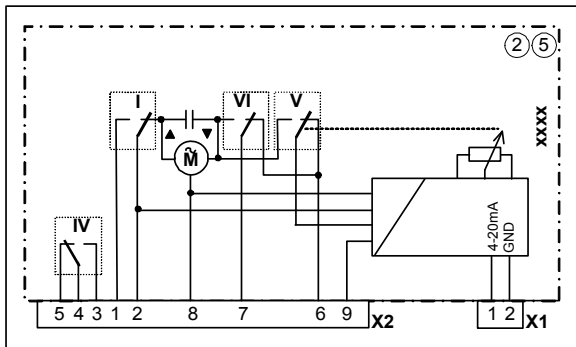
Range adjustment

See SQM4x.x4xxxx in this chapter.



Note!

For the sake of clarity, the plug-in contacts do not appear in sequential order in the circuit diagram. Consecutive numbers are printed on the unit, however, e.g. 1...7.



| Low-voltage terminals | | | Dimensioning |
|-------------------------|---|--------|--|
| X1-1 | 4...20 mA | Input | max. 20 mA to X1-2 |
| X1-2 | GND | Input | --- |
| Mains voltage terminals | | | Dimensioning |
| X2-1 | Open position reached (I) | Output | AC 120 V / AC 230 V max. 10 mA, $\cos\phi > 0.9$ |
| X2-2 | Open, high-fire (I) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ * |
| X2-3 | Auxiliary switch AUX (IV) NO contact | Output | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X2-4 | Auxiliary switch AUX (IV) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X2-5 | Auxiliary switch AUX (IV) NC opener | Output | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X2-6 | Low-fire position / ignition load position reached (V / VI) | Output | AC 120 V / AC 230 V max. 10 mA, $\cos\phi > 0.9$ |
| X2-7 | Close / ignition (VI) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ * |
| X2-8 | Neutral | Input | AC 120 V / AC 230 V max. 60 mA / 30 mA |
| X2-9 | Controller release | Input | AC 120 V / AC 230 V max. 60 mA / 30 mA |

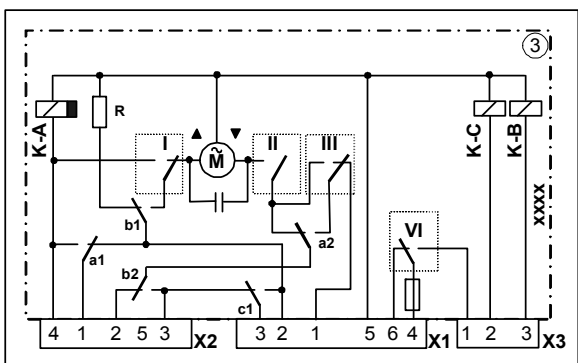
* Only the control lines to the burner controls or to the control unit may be connected at the marked terminals. It is not permitted to connect additional external loads, such as signal lamps.

Range adjustment

See SQM4x.x4xxxx in this chapter.

Note!

For the sake of clarity, the plug-in contacts do not appear in sequential order in the circuit diagram. Consecutive numbers are printed on the unit, however, e.g. 1...7.



| Mains voltage terminals | | | Dimensioning |
|-------------------------|---|--------|---|
| X1-1 | Free | --- | --- |
| X1-2 | Controller, open | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X1-3 | Controller release | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X1-4 | Auxiliary switch AUX (VI) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ ** |
| X1-5 | Neutral | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X1-6 | Auxiliary switch AUX (VI) NC opener | Output | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ ** |
| X2-1 | Fan supply voltage | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X2-2 | Mains voltage, close | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X2-3 | Low-fire controller | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X2-4 | Fan motor | Output | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X2-5 | Free | --- | --- |
| X3-1 | Auxiliary switch AUX (VI) NO contact | Output | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ ** |
| X3-2 | Open (I) / close (II), changeover relay K-C | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X3-3 | Operation, changeover relay K-B | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |



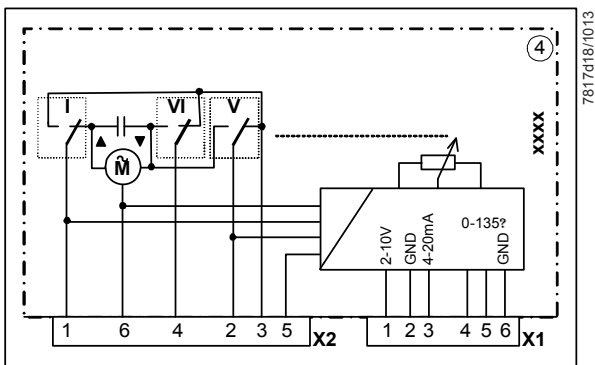
Notice!

** When connecting a fuel valve: Max. 0.3 A, $\cos\phi > 0.8$ inductive.

Range adjustment

See SQM4x.x4xxxx in this chapter.

Note!
 For the sake of clarity, the plug-in contacts do not appear in sequential order in the circuit diagram.
 Consecutive numbers are printed on the unit, however, e.g. 1...7.



| Low-voltage terminals | | | Dimensioning |
|-------------------------|-----------------------|--------|---|
| X1-1 | 2...10 V | Input | max. DC 10 V to X1-2 |
| X1-2 | GND | Input | |
| X1-3 | 4...20 mA | Input | Max. 20 mA to X1-2 |
| X1-4 | 0...135 Ω 1 | Input | |
| X1-5 | 0...135 Ω 2 | Input | |
| X1-6 | 0...135 Ω 3 (GND) | Input | |
| Mains voltage terminals | | | Dimensioning |
| X2-1 | Opening (I) | Input | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 * |
| X2-2 | Move to low-fire (V) | Input | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 * |
| X2-3 | Position reached | Output | AC 120 V / AC 230 V max. 10 mA, cosφ >0.9 |
| X2-4 | Closing/ignition (VI) | Input | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 |
| X2-5 | Controller release | Input | AC 120 V / AC 230 V max. 60 mA / 30 mA |
| X2-6 | Neutral | Input | AC 120 V / AC 230 V max. 60 mA / 30 mA |

* Only the control lines to the burner controls or to the control unit may be connected at the marked terminals.
 It is not permitted to connect additional external loads, such as signal lamps.

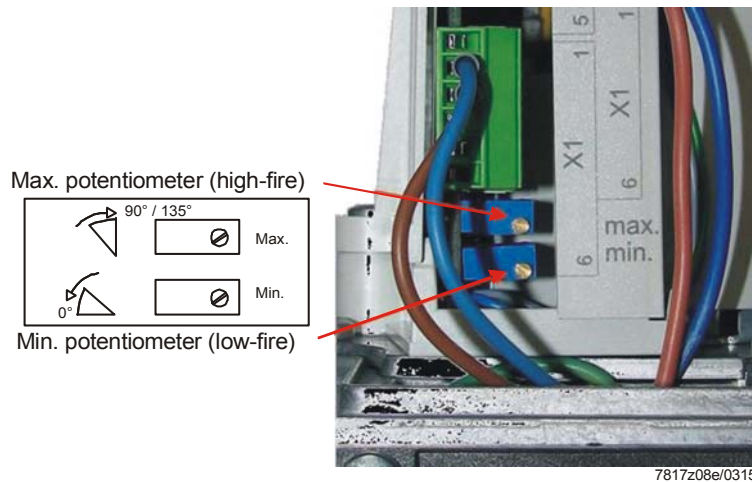
Range adjustment

Adjust the range of the analog signal to match the switch positions (min. and max. position):

1. Set cam I to the required high-fire position (e.g. 85°; position is indicated on the scale next to the cam).
2. Set cam V to the required low-fire position (e.g. 20°).
3. Preset the signal at the analog input according to the required high-fire position (e.g. 20 mA).
4. Turn the potentiometer for maximum angular rotation
 - a) clockwise, if the actuator has not yet reached its maximum angular rotation, or
 - b) counterclockwise until the actuator starts
5. Preset the signal at the analog input according to the low-fire position (e.g. 4 mA).
6. Turn the potentiometer for minimum angular rotation
 - a) counterclockwise, if the actuator has not yet reached its minimum angular rotation, or
 - b) clockwise until the actuator starts

Modulation always takes place between high- and low-fire.

Also, it is possible to define a closed position or a separate ignition position by setting cam VI (independent of cam V, e.g. for defining a position higher than the low-fire position).

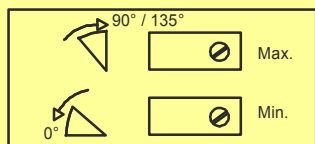


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Note!

When starting up, the direction of rotation of the potentiometer setting must be observed:

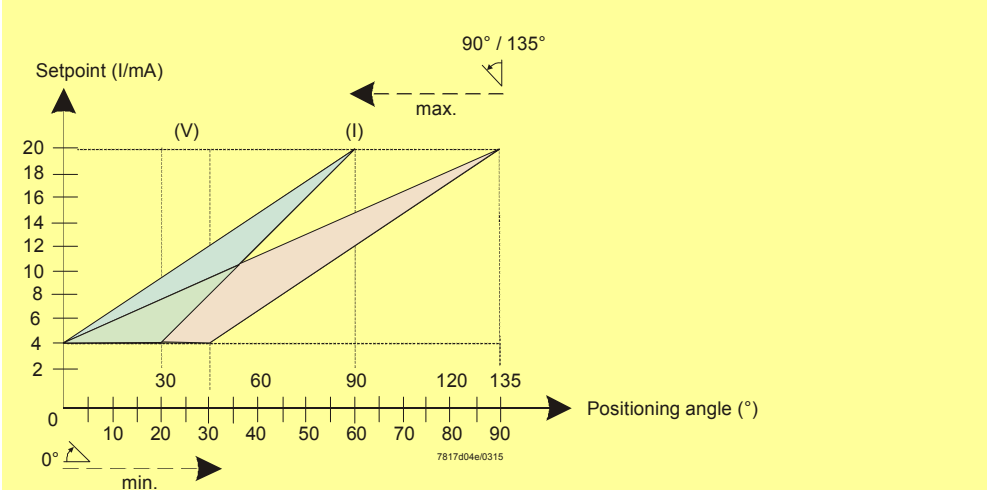


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Note

The working range of the potentiometer setting, shown as an example for the current input 4...20 mA.

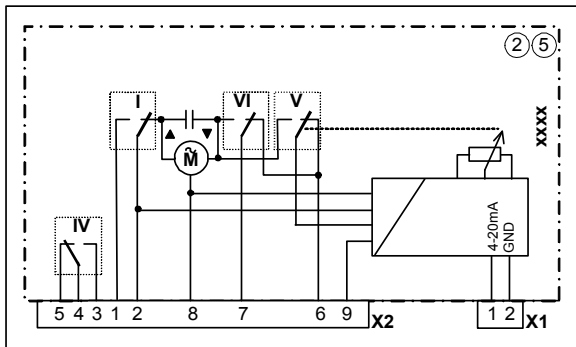


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Note!

For the sake of clarity, the plug-in contacts do not appear in sequential order in the circuit diagram. Consecutive numbers are printed on the unit, however, e.g. 1...7.



| Low-voltage terminals | | | Dimensioning |
|-------------------------|--|--------|---|
| X1-1 | 4...20 mA | Input | max. 20 mA to X1-2 |
| X1-2 | GND | Input | --- |
| Mains voltage terminals | | | Dimensioning |
| X2-1 | Open position reached (I) | Output | AC 120 V / AC 230 V max. 10 mA, $\cos\varphi > 0.9$ |
| X2-2 | Open / high-fire (I) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ * |
| X2-3 | Auxiliary switch AUX (IV) NO contact | Output | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ |
| X2-4 | Auxiliary switch AUX (IV) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ |
| X2-5 | Auxiliary switch AUX (IV) / NC opener | Output | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ |
| X2-6 | Low-fire position / ignition load position reached (V, VI) | Output | AC 120 V / AC 230 V max. 10 mA, $\cos\varphi > 0.9$ |
| X2-7 | Close / ignition (VI) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ * |
| X2-8 | Neutral | Input | AC 120 V / AC 230 V max. 60 mA / 30 mA |
| X2-9 | Controller release | Input | AC 120 V / AC 230 V max. 60 mA / 30 mA |

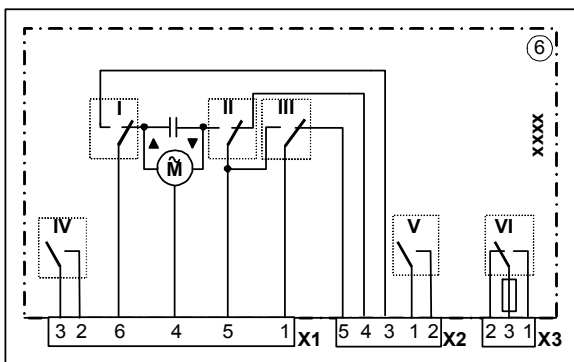
* Only the control lines to the burner controls or to the control unit may be connected at the marked terminals. It is not permitted to connect additional external loads, such as signal lamps.

Range adjustment

See SQM4x.x4xxxx in this chapter.

Note!

For the sake of clarity, the plug-in contacts do not appear in sequential order in the circuit diagram. Consecutive numbers are printed on the unit, however, e.g. 1...7.



| Mains voltage terminals | | | Dimensioning |
|-------------------------|--------------------------------------|--------|---|
| X1-1 | Move to ignition position (III) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X1-2 | Auxiliary switch AUX (IV) NO contact | Output | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X1-3 | Auxiliary switch AUX (IV) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X1-4 | Neutral | | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X1-5 | Closing (II) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X1-6 | Opening (I) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X2-1 | Auxiliary switch AUX (V) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X2-2 | Auxiliary switch AUX (V) NO contact | Output | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ |
| X2-3 | Open position reached (I) | Output | AC 120 V / AC 230 V max. 0.3 A, $\cos\phi > 0.8$ |
| X2-4 | Close position reached (II) | Output | AC 120 V / AC 230 V max. 0.3 A, $\cos\phi > 0.8$ |
| X2-5 | Ignition position reached (III) | Output | AC 120 V / AC 230 V max. 0.3 A, $\cos\phi > 0.8$ |
| X3-1 | Auxiliary switch AUX (VI) NO contact | Output | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ ** |
| X3-2 | Auxiliary switch AUX (VI) NC opener | Output | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ ** |
| X3-3 | Auxiliary switch AUX (VI) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\phi > 0.9$ ** |



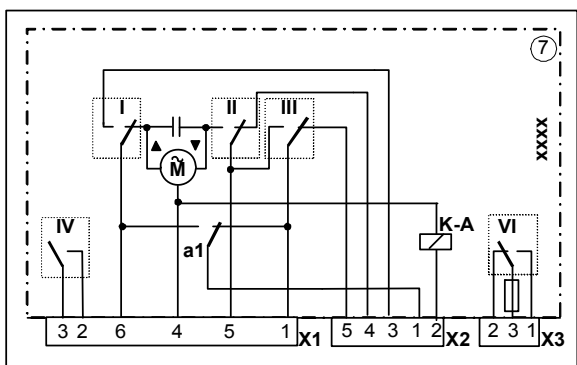
Notice!

** When connecting a fuel valve: Max. 0.3 A, $\cos\phi > 0.8$ inductive.

Range adjustment

See SQM4x.x4xxxx in this chapter.

Note!
 For the sake of clarity, the plug-in contacts do not appear in sequential order in the circuit diagram.
 Consecutive numbers are printed on the unit, however, e.g. 1...7.



| Mains voltage terminals | | | Dimensioning |
|-------------------------|---|--------|---|
| X1-1 | Move to ignition position (III) | Input | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 |
| X1-2 | Auxiliary switch AUX (IV) NO contact | Output | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 |
| X1-3 | Auxiliary switch AUX (IV) | Input | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 |
| X1-4 | Neutral | | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 |
| X1-5 | Closing (II) | Input | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 |
| X1-6 | Opening (I) | Input | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 |
| | | | |
| X2-1 | Mains voltage | Input | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 |
| X2-2 | Open / close relay | Input | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 |
| X2-3 | Open position reached (I) | Output | AC 120 V / AC 230 V max. 0.3 A, cosφ >0.8 |
| X2-4 | Close position reached (II) | Output | AC 120 V / AC 230 V max. 0.3 A, cosφ >0.8 |
| X2-5 | Ignition position reached (III) | Output | AC 120 V / AC 230 V max. 0.3 A, cosφ >0.8 |
| | | | |
| X3-1 | Auxiliary switch AUX (VI) NO contact | Output | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 ** |
| X3-2 | Auxiliary switch AUX (VI) NC opener | Output | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 ** |
| X3-3 | Auxiliary switch AUX (VI) | Input | AC 120 V / AC 230 V max. 1 A, cosφ >0.9 ** |



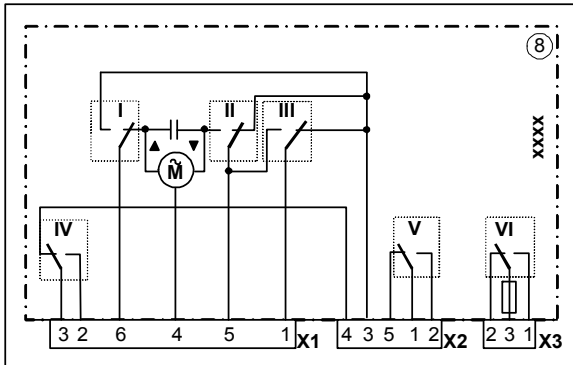
Notice!
**** When connecting a fuel valve:
 Max. 0.3 A, cosφ >0.8 inductive.**

Range adjustment

See SQM4x.x4xxxx in this chapter.

Note!

For the sake of clarity, the plug-in contacts do not appear in sequential order in the circuit diagram. Consecutive numbers are printed on the unit, however, e.g. 1...7.



| Mains voltage terminals | | | Dimensioning |
|-------------------------|---|--------|---|
| X1-1 | Move to position (III) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ |
| X1-2 | Auxiliary switch AUX (IV) NO contact | Output | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ |
| X1-3 | Auxiliary switch AUX (IV) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ |
| X1-4 | Neutral | Input | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ inductive |
| X1-5 | Closing (II) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ |
| X1-6 | Opening (I) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ |
| X2-1 | Auxiliary switch AUX (V) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ |
| X2-2 | Auxiliary switch AUX (V) NO contact | Input | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ |
| X2-3 | Position reached (I / II / III) | Output | AC 120 V / AC 230 V max. 0.3 A, $\cos\varphi > 0.8$ |
| X2-4 | Auxiliary switch AUX (IV) NC opener | Output | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ |
| X2-5 | Auxiliary switch AUX (V) NC opener | Output | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ |
| X3-1 | Auxiliary switch AUX (VI) NO contact | Output | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ ** |
| X3-2 | Auxiliary switch AUX (VI) NC opener | Output | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ ** |
| X3-3 | Auxiliary switch AUX (VI) | Input | AC 120 V / AC 230 V max. 1 A, $\cos\varphi > 0.9$ ** |



Notice!

** When connecting a fuel valve:
Max. 0.3 A, $\cos\varphi > 0.8$ inductive.

Range adjustment

See SQM4x.x4xxxx in this chapter.

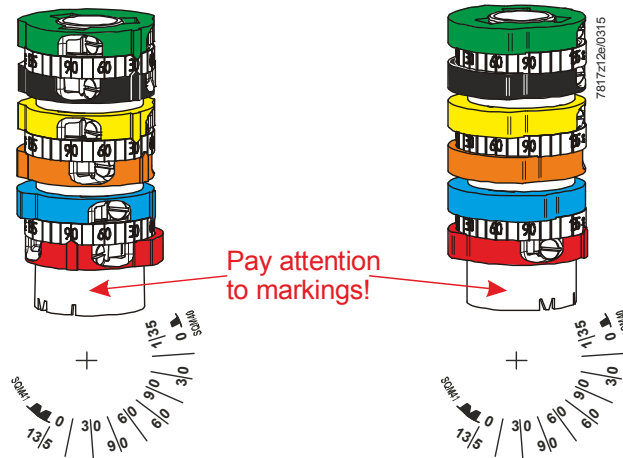
Position indication, preadjustment and coloring of the cams

Position indication SQM40...

External angle scale
Marking in slot shape

Position indication SQM41...

Internal angle scale
Arrow marking



Note!
The setting of the switch positions must be checked before startup.

SQM4x.x1xxx
SQM4x.x4xxx

| Electronic version | | | |
|--------------------|--------|----------------|---------------|
| Cam | Color | Position | Preadjustment |
| Cam I | Red | High-fire | 90° |
| Cam II | Blue | Not used | --- |
| Cam III | Orange | Not used | --- |
| Cam IV | Yellow | Not used | --- |
| Cam V | Black | Low-fire | 15° |
| Cam VI | Green | OFF / ignition | 0° |

SQM4x.x3xxx

| 2 position version | | | |
|--------------------|--------|-------------------|---------------|
| Cam | Color | Position | Preadjustment |
| Cam I | Red | High-fire | 90° |
| Cam II | Blue | OFF / low-fire | 0° |
| Cam III | Orange | Ignition position | 15° |
| Cam IV | Yellow | Not used | --- |
| Cam V | Black | Not used | --- |
| Cam VI | Green | Auxiliary switch | 30° |

SQM4x.x2xxx
SQM4x.x5xxx

| Electronic version | | | |
|--------------------|--------|------------------|---------------|
| Cam | Color | Position | Preadjustment |
| Cam I | Red | High-fire | 90° |
| Cam II | Blue | Not used | --- |
| Cam III | Orange | Not used | --- |
| Cam IV | Yellow | Auxiliary switch | 30° |
| Cam V | Black | Low-fire | 30° |
| Cam VI | Green | OFF / ignition | 0° |

Position indication, preadjustment and coloring of the cams (cont'd)

SQM4x.x6xxxx

SQM4x.x8xxxx

| 3 position version | | | |
|--------------------|--------|-------------------|---------------|
| Cam | Color | Position | Preadjustment |
| Cam I | Red | High-fire | 90° |
| Cam II | Blue | OFF / low-fire | 0° |
| Cam III | Orange | Ignition position | 15° |
| Cam IV | Yellow | Auxiliary switch | 30° |
| Cam V | Black | Auxiliary switch | 30° |
| Cam VI | Green | Auxiliary switch | 30° |

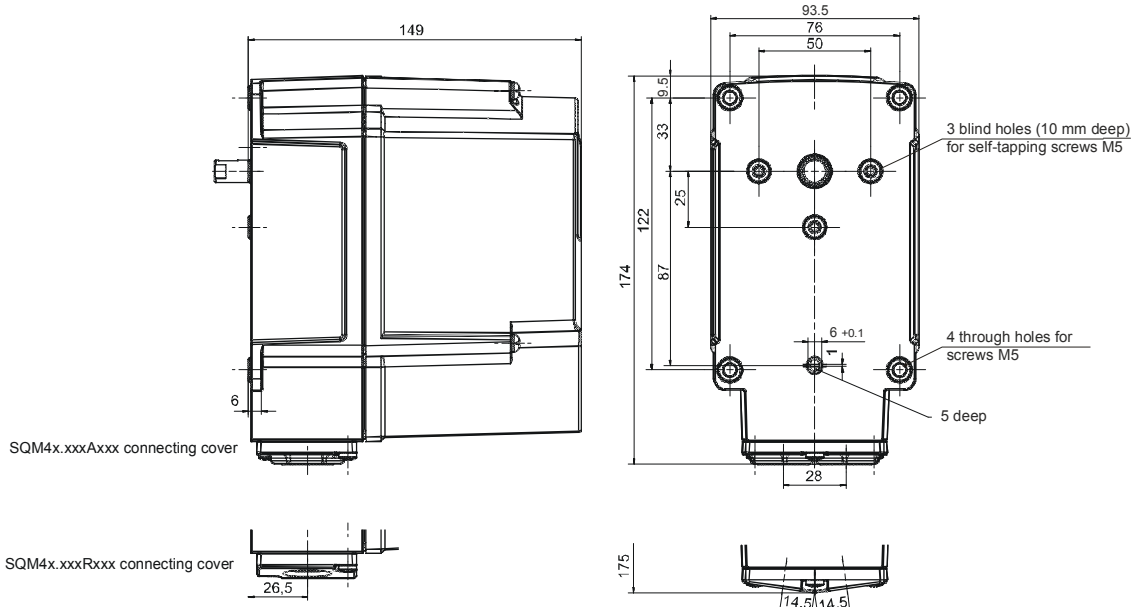
SQM4x.x7xxxx

| 3 position version | | | |
|--------------------|--------|-------------------|---------------|
| Cam | Color | Position | Preadjustment |
| Cam I | Red | High-fire | 90° |
| Cam II | Blue | OFF / low-fire | 0° |
| Cam III | Orange | Ignition position | 15° |
| Cam IV | Yellow | Auxiliary switch | 30° |
| Cam V | Black | Not used | --- |
| Cam VI | Green | Auxiliary switch | 30° |

Dimensions

Dimensions in mm

SQM40.../SQM41...



| Model | Key Type | Key Dimensions | Shaft no. |
|--------------|--|----------------|-----------|
| SQM4x.xx1xxx | Slot for woodruff key 3x3.7 series A Din6888 | | 1 |
| SQM4x.xx4xxx | Square | | 4 |
| SQM4x.xx5xxx | D-shaft | | 5 |
| SQM4x.xx7xxx | Slot for parallel key A5x3x28 DIN6885 T3 | | 7 |

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