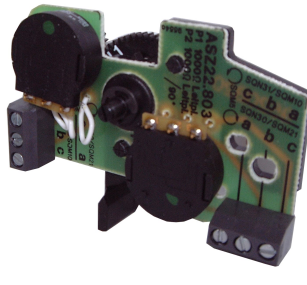


ASZxx.7xx / ASZxx.8xx



ASZxx.7xx / ASZxx.8xx /
ASZxx.9xx



ASZxx.3x



ASZxx.3x

Potentiometer

ASZ...

For integration into SQM and SQN actuators to electrically indicate the positions of the actuator shafts. Single and double potentiometers in wire, cermet, or conductive plastic design.

The ASZ and this data sheet are intended for original equipment manufacturers (OEMs) using the ASZ in or on their products.

Use

The ASZs are specially designed for mounting to the drive shafts of SQM4 and SQN actuators. They can be used for both position indication and position feedback (position checkback signal). The wire and cermet potentiometers are suitable for general use. For SQM1/SQM2/SQM4 and SQN actuators in combination with electronic fuel-air ratio control systems or SQM5 actuators together with AGA56 electronic function modules, only conductive plastic potentiometers may be used due to their longer service life and higher resolution.

Supplementary documentation

Product type	Product name	Type of documentation	Documentation number
SQN3 / SQN4	Actuator	Data sheet	N7808
SQN70 / SQN71	Actuator	Data sheet	N7804
SQN72	Actuator	Data sheet	N7802
SQN73	Actuator	Data sheet	N7808
SQN74 / SQN75	Actuator	Data sheet	N7804
SQN90 / SQN91	Actuator	Data sheet	N7806
SQM1 / SQM2	Actuator	Data sheet	N7812
SQM40 / SQM41	Actuator	Data sheet	N7817
SQM5 + AGA56	Actuator + electronic function module	Data sheet	N7815

Disclaimer

Please note that this translation may not fully reflect all linguistic nuances, technical terminology, or cultural context of the original text. Although it has been prepared with due care, variations in content or interpretation cannot be entirely excluded. This translation is provided for general informational purposes only and shall **not** be regarded as legally binding or as the final version. For any official or legally binding matters, reference should always be made to the **original version** in German.

Warning notes



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

Do not interfere with or modify the ASZ.

- All activities (mounting, installation, service work, etc.) must be performed by qualified staff
- Before carrying out any wiring changes in the connection area, isolate the plant from the power supply (all-pole disconnection). Ensure that the plant cannot be inadvertently switched on again and that it is indeed dead. Failure to observe this information poses a risk of electric shock
- Take suitable measures to provide protection against accidental contact at the electrical connections
- Each time work has been carried out (mounting, installation, service work, etc.), check that the wiring is correctly set
- These ASZs must not be put into operation following impact or shock; even if they do not exhibit any visible damage, their safety functions may be impaired

Mounting notes

Ensure that the relevant national safety regulations are complied with.

Standards and certificates



Note
Only in connection with the actuator!



Note
Environmental Product Declaration (EPD).
The Environmental Product Declaration for the ASZ includes a full life cycle assessment (LCA) and can be accessed via the following link:
<http://www.siemens.com/bt/download>



EAC conformity (Eurasian conformity)

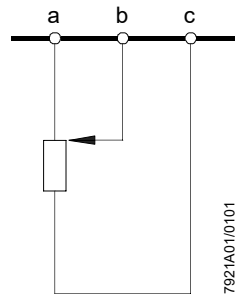


China RoHS
Hazardous substances table:
<http://www.siemens.com/download?A6V10883536>

Disposal notes

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

Connection diagram



The ASZ is illustrated in the start position.

Terminal markings:

a = pickup at end of potentiometer

b = potentiometer wiper

c = pickup at end of potentiometer

Apply operating voltage to “a” and “c”. Apply operating voltage to ‘a’ and ‘c’.
Conductive plastic ASZs can be destroyed if operating voltage is applied between ‘a → b’ or ‘b → c’.

If the ASZ envisaged 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 is configured for a high-fire over 90°. This can happen if the switch position of the switching cam I is configured for a high-fire over 90°.

For SQM40/SQM41 actuators

ASZ22.32:

The 90° design can be used for both directions of rotation (SQM40 actuator (counterclockwise) / SQM41 actuator (clockwise)).

ASZ22.34 and ASZ22.35:

The 135° designs are each intended for a particular direction of rotation.

The direction of rotation of the ASZ must correspond with the direction of rotation of the SQM4x actuator as follows:

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

For SQN7x actuators

ASZx2.30:

The 90° design can be used for both directions of rotation (SQN70/SQN72/SQN74 actuator (counterclockwise) / SQN71/SQN73/SQN75 actuator (clockwise)).

ASZx2.33

The 135° design can be used for both directions of rotation (SQN70/SQN72/SQN74 actuator (counterclockwise) / SQN71/SQN73/SQN75 actuator (clockwise)).

The ASZs consist of a wire, cermet, or conductive plastic resistance track and are accommodated in a plastic housing mounted on a printed circuit board. The electrical connection is established for single potentiometers via a 3-pole screw terminal strip and for double potentiometers via two 3-pole screw terminal strips. The ASZs have no mechanical limitation of the angular rotation.

The force is transmitted between the actuator shaft and the potentiometer spindle:

- For the ASZ12.30, ASZ12.33, ASZ22.30, and ASZ22.33
 - Frictionally engaged, by means of a collet
 - Sitting directly on the actuator shaft
- For the ASZ22.32, ASZ22.34, and ASZ22.35
 - Form fitted, by means of a D-hole
 - Sitting directly on the actuator shaft
- For the ASZxx.7xx, ASZxx.8xx, and ASZxx.9xx
 - Frictionally engaged, by means of a collet
 - Sitting directly on the actuator shaft.
 - Low backlash and low hysteresis, via plastic gear wheels

Type summary

			For actuators				
			SQM1, SQM2, SQM5	SQN3 ²⁾ , SQN4, SQN90 / SQN91 ⁵⁾	SQN7x ³⁾ SQM1, SQM2 ⁴⁾ SQM5	SQM40	SQM41
Material	Angular rotation	Resistance	Type reference				
Single potentiometer							
Wire or cermet	90°	135 Ω	ASZ16.703	ASZ16.703	---	---	---
		220 Ω	ASZ8.703	ASZ8.703	---	---	---
		1000 Ω	ASZ12.703	ASZ12.703	---	---	---
	135°	135 Ω	ASZ16.733 ¹⁾	ASZ16.733 ¹⁾	---	---	---
		220 Ω	ASZ8.733	ASZ8.733	---	---	---
		1000 Ω	ASZ12.733	ASZ12.733	---	---	---
Conductive plastic	90°	1000 Ω	ASZ12.803	ASZ12.803	ASZ12.30	---	---
	135°	1000 Ω	ASZ12.833	ASZ12.833	ASZ12.33 ⁶⁾	---	---
Double potentiometer							
Wire or cermet	90°	1000 / 1000 Ω	ASZ22.703	ASZ22.703	---	---	---
		135 / 135 Ω	ASZ66.703	ASZ66.703	---	---	---
	135°	220 / 220 Ω	ASZ88.733 ¹⁾	ASZ88.733 ¹⁾	---	---	---
		1000 / 220 Ω	ASZ82.733 ¹⁾	ASZ82.733 ¹⁾	---	---	---
		1000 / 1000 Ω	ASZ22.733	ASZ22.733	---	---	---
Conductive plastic	90°	1000 / 1000 Ω	ASZ22.803	ASZ22.803	ASZ22.30	ASZ22.32	ASZ22.32
	135°	1000 / 1000 Ω	ASZ22.833	ASZ22.833	ASZ22.33 ⁶⁾	ASZ22.35	ASZ22.34
Wire or cermet / conductive plastic	90°	1000 / 1000 Ω	ASZ22.903	ASZ22.903	---	---	---
	135°	1000 / 1000 Ω	ASZ22.933	ASZ22.933	---	---	---

¹⁾ Only available on request

²⁾ Only with a high AGA32 conversion kit, refer to Data Sheet N7808 and 'Accessories'

³⁾ Design with a high AGA34 cover, refer to Data Sheet N7804:

- SQN70/SQN71 actuator (refer to Data Sheet N7804): Circuit diagram no. 0, 6, 7
- SQN74/SQN75 actuator (refer to Data Sheet N7804): Circuit diagram no. 6, 7, 8, 9, K
- SQN72 actuator (refer to Data Sheet N7802): Circuit diagram A, C, D, E

⁴⁾ Not for actuators with external position indication

⁵⁾ Only with additional AGA09 potentiometer fixing, refer to 'Accessories'

⁶⁾ Only for SQN72 actuators

Article no.	Type
BPZ:ASZ8.703	ASZ8.703
BPZ:ASZ8.733	ASZ8.733
BPZ:ASZ12.30	ASZ12.30
BPZ:ASZ12.33	ASZ12.33
BPZ:ASZ12.703	ASZ12.703
BPZ:ASZ12.733	ASZ12.733
BPZ:ASZ12.803	ASZ12.803
BPZ:ASZ12.833	ASZ12.833
BPZ:ASZ16.703	ASZ16.703
BPZ:ASZ16.733	ASZ16.733
BPZ:ASZ22.30	ASZ22.30
S55852-Z301-A100	ASZ22.32
BPZ:ASZ22.33	ASZ22.33
S55852-Z302-A100	ASZ22.34
S55852-Z303-A100	ASZ22.35
BPZ:ASZ22.703	ASZ22.703
BPZ:ASZ22.733	ASZ22.733
BPZ:ASZ22.803	ASZ22.803
BPZ:ASZ22.833	ASZ22.833
BPZ:ASZ22.903	ASZ22.903
BPZ:ASZ22.933	ASZ22.933
BPZ:ASZ66.703	ASZ66.703
BPZ:ASZ82.733	ASZ82.733
BPZ:ASZ88.733	ASZ88.733

Accessories (must be ordered separately)

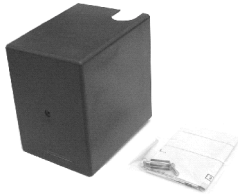


Potentiometer fixing

(only for ASZxx.7xx and ASZxx.8xx)
For use with the SQN9x actuator

AGA09

Article no.: **BPZ:AGA09**

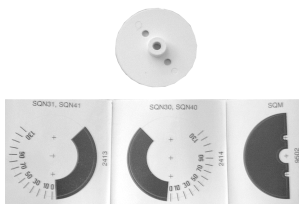


Conversion kit

For retrofitting an SQN3/SQN4 actuator with an ASZxx.7xx or ASZxx.8xx
(conversion from low to high housing cover).

AGA32

Article no.: **BPZ:AGA32**



Service kit

(only for ASZxx.7xx and ASZxx.8xx)

- For use with SQM1 / SQM2 / SQM5 / SQN3 / SQN4 actuators
- For replacing ASZxx.5xx / ASZxx.6xx with ASZxx.7xx / ASZxx.8xx

AGA33

Article no.: **BPZ:AGA33**



Cover

For retrofitting an SQN70/SQN71 actuator with an ASZxx.3x

AGA34

Article no.: **BPZ:AGA34**

Design with a high AGA34 cover, refer to Data Sheet N7804:

- SQN70/SQN71 actuator (refer to Data Sheet N7804): Circuit diagram no. 0, 6, 7
- SQN74/SQN75 actuator (refer to Data Sheet N7804): Circuit diagram no. 6, 7, 8, 9, K
- SQN72 actuator (refer to Data Sheet N7802): Circuit diagram A, C, D, E

Technical data

General unit data	Type	ASZxx.7xx ASZxx.8xx ASZxx.9xx	ASZxx.3x
	Operating voltage	10 V DC	10 V DC
	Permissible hysteresis	0.2% of 90° or 135°	0.3% of 90° or 135°
	Total resistance tolerance	±20%	±20%
	Mechanical angular rotation	360°, with no end stops	360°, with no end stops
	Effective angular rotation	90° or 135°	90° or 135°
	Total resistance values (Rges) at		
	• < 0°	Infinite	Infinite
	• > 90° or > 135°	Infinite	Infinite
	Connection terminal strip		
	• Single potentiometer	3-pole	3-pole
	• Double potentiometer	6-pole	6-pole
	For cross-sectional areas of	0.5 to 1 mm ²	0.5 to 1 mm ²
	Adjusting torque of potentiometer unit	≤0.025 Nm	≤0.04 Nm
	Mounting position	Optional	Optional
	Weight		
	• Single potentiometer	Approx. 27 g	Approx. 15 g
	• Double potentiometer	Approx. 41 g	Approx. 20 g
Environmental conditions	Storage	DIN EN 60721-3-1:1997	
	Climatic conditions	Class 1K3	
	Mechanical conditions	Class 1M2	
	Temperature range	-20 to +60°C	
	Humidity	< 95% r.h.	
	Transport	DIN EN 60721-3-2:1997	
	Climatic conditions	Class 2K2	
	Mechanical conditions	Class 2M2	
	Temperature range	-50 to +75°C	
	Humidity	< 95% r.h.	
	Operation	DIN EN 60721-3-3:1995 + A2:1997	
	Climatic conditions	Class 3K3	
	Mechanical conditions	Class 3M3	
	Temperature range	-20 to +70°C	
	Humidity	< 95% r.h.	
	Installation altitude	Max. 2,000 m above sea level	



Warning!

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

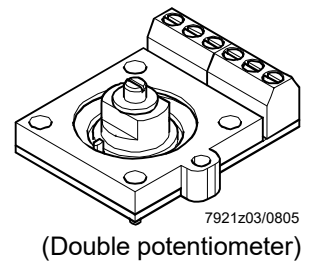
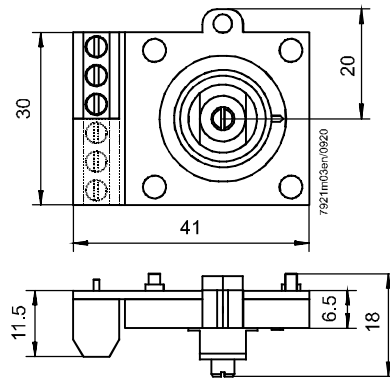
Wire potentiometer / Cermet potentiometer	Load capacity	Max. 1 W at 70°C	---
	Wiper current rating	Min. 1 mA Max. 100 mA	---
	Transfer resistance (Rü) of wiper contact	Rü ≤2% of Rges at 1 mA	---
	Lifetime	Approx. 250,000 switching cycles	---
Conductive plastic potentiometer	Wiper current rating	Max. 100 µA	Max. 100 µA
	Transfer resistance of the wiper contact	Max. Rü ≤100 Ω	Max. Rü ≤500 Ω
	Linearity (based on Rges = 1000 Ω)	±1%	±1%
	Sleekness (alpha = 10°) / microlinearity	< 0.1%	±0.5%
	Lifetime	Approx. 2 million switching cycles	Approx. 2 million switching cycles

Dimensions

Dimensions in mm

ASZxx.3x

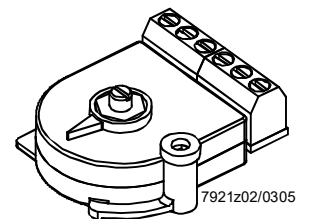
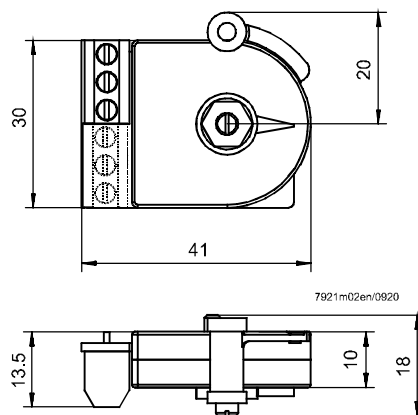
Area with broken lines
→ Lower terminal strip
only with double
potentiometer equipped



(Double potentiometer)

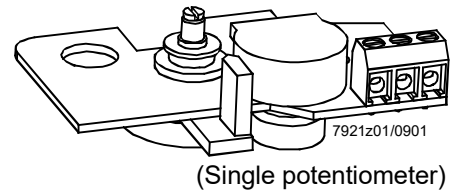
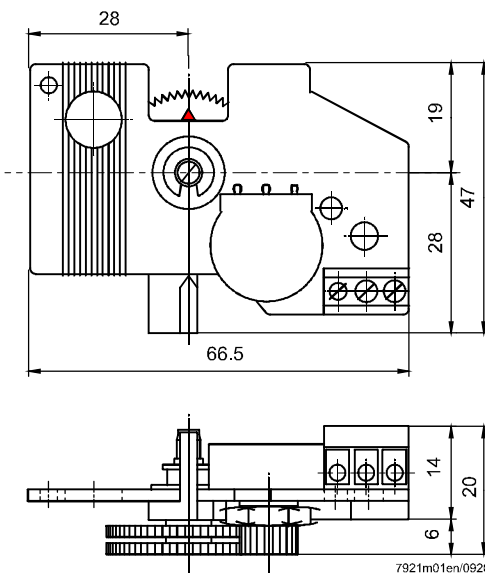
Alternative design of
ASZxx.3x

Area with broken lines
→ Lower terminal strip
only with double
potentiometer equipped



(Double potentiometer)

ASZxx.7xx
ASZxx.8xx
ASZxx.9xx



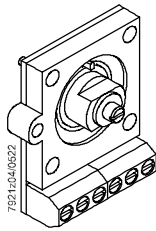
(Single potentiometer)

Mounting the ASZx2.30/ASZx2.33 on the SQN7x actuator

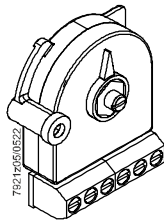


Please note!
Electric shock hazard.
The ASZx2.30/ASZx2.33 must be switched off before mounting.

ASZx2.30/ASZx2.33 potentiometer

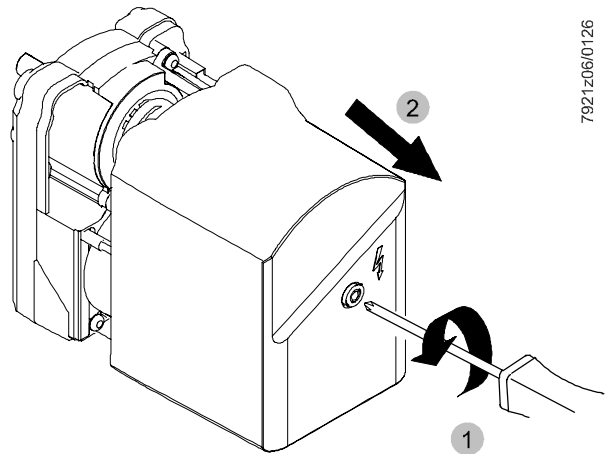


Option

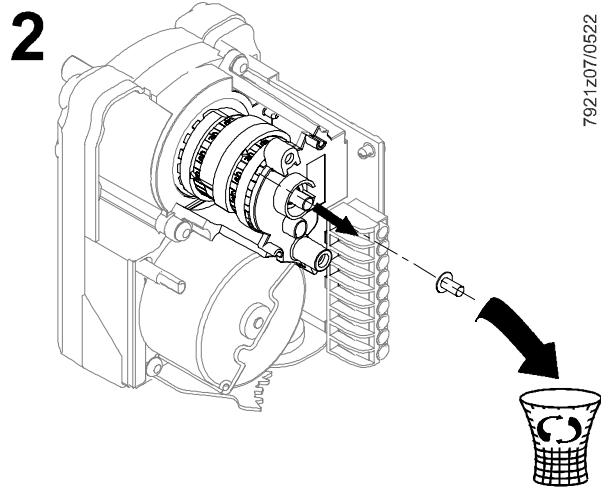


SQN7x/SQM5 actuators

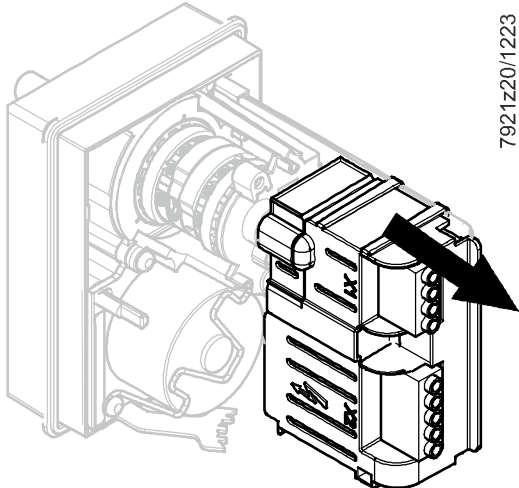
SQN7x.x0xxx	SQN7x.xAxxx	SQM5
SQN7x.x6xxx	SQN7x.xBxxx	
SQN7x.x7xxx	SQN7x.xCxxx	
SQN7x.x8xxx	SQN7x.xKxxx	
SQN7x.x9xxx		



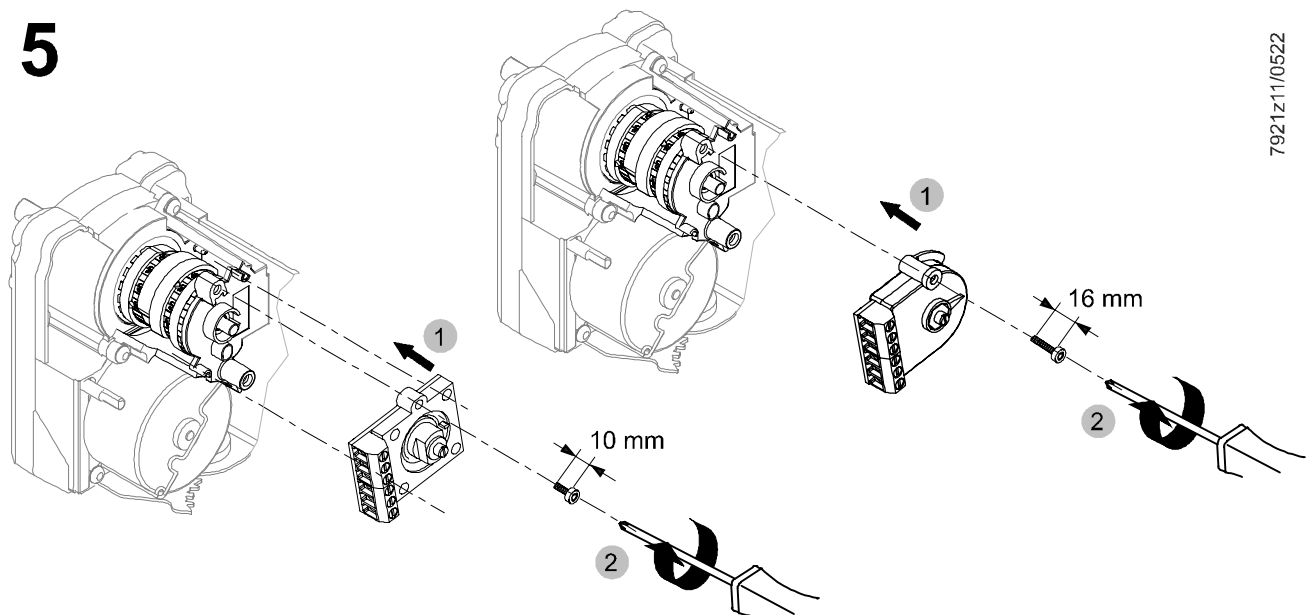
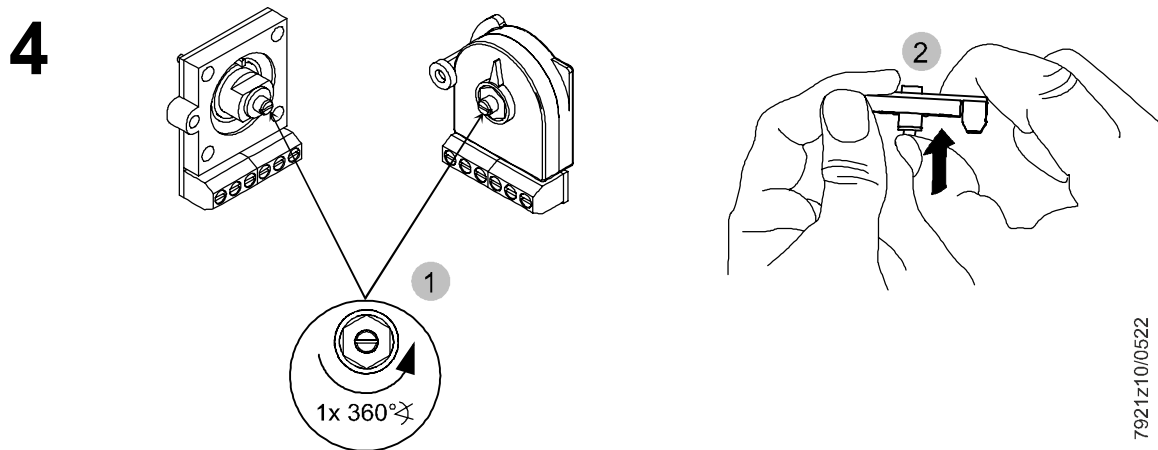
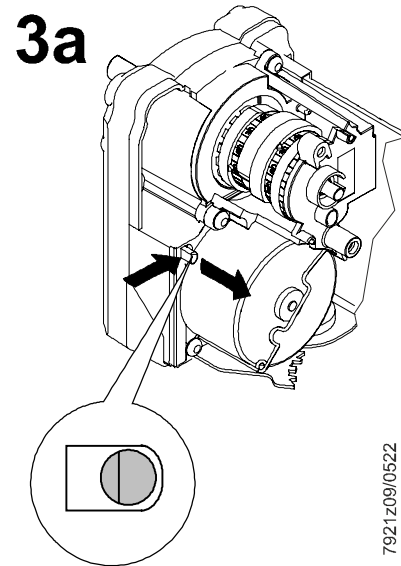
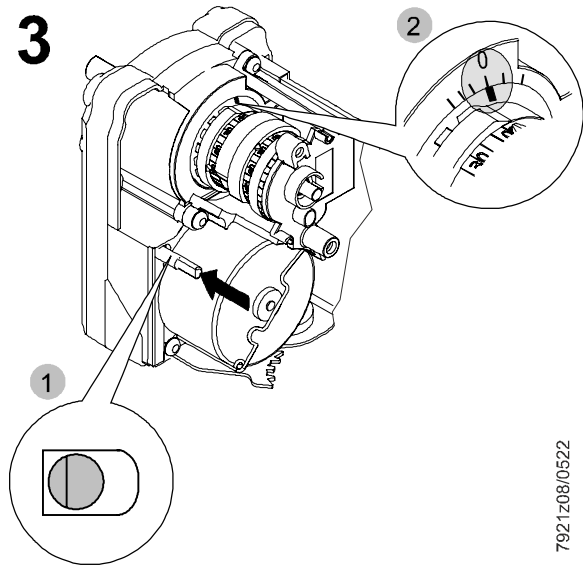
SQN70/SQN71 and SQN74/SQN75 actuator



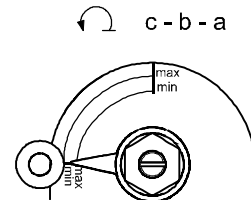
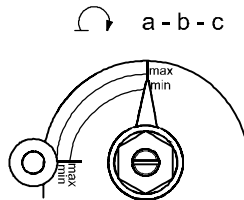
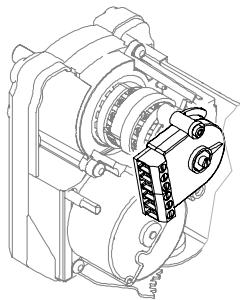
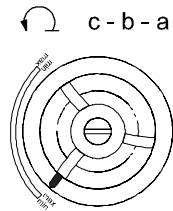
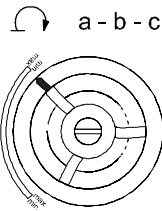
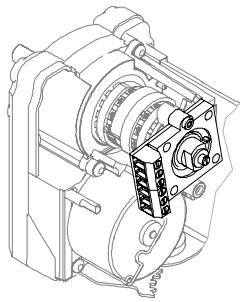
SQN72/SQN73 actuator



Please note!
Refer to Step 8.

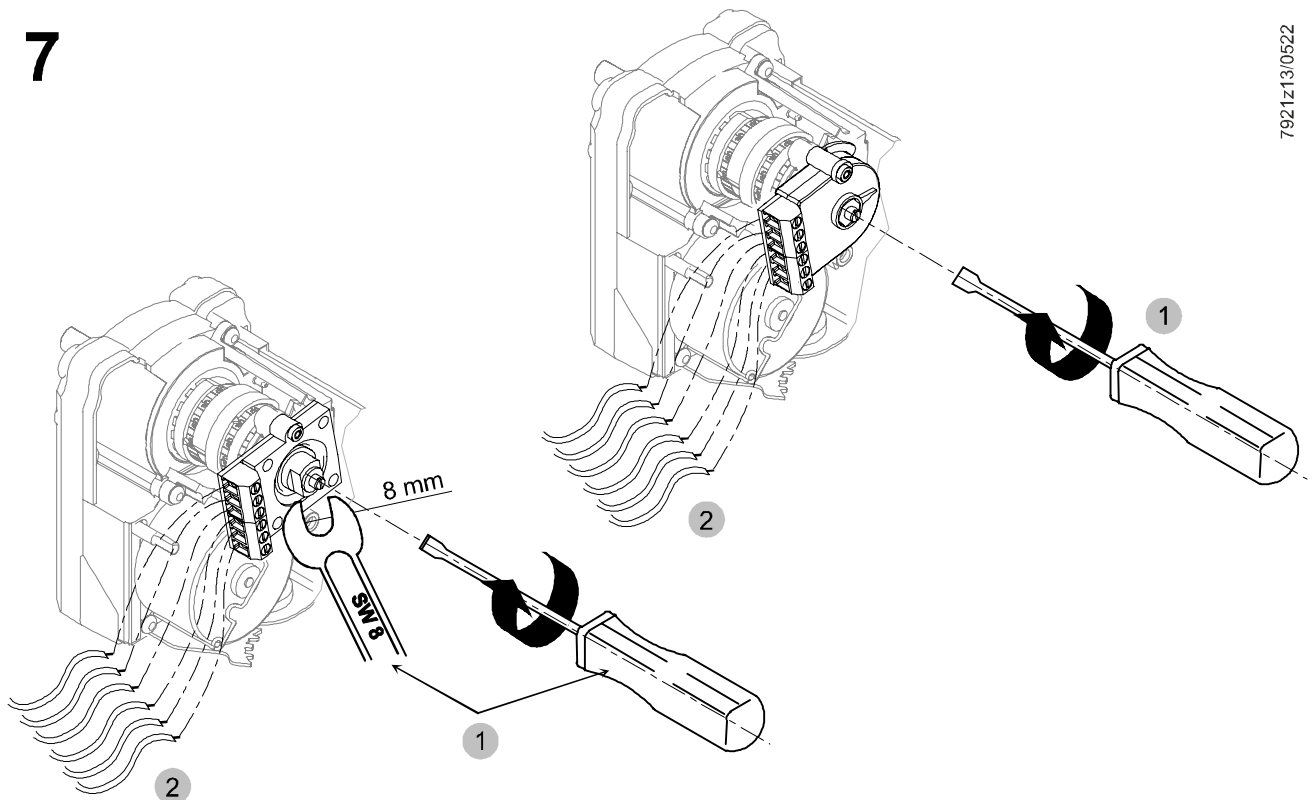


6



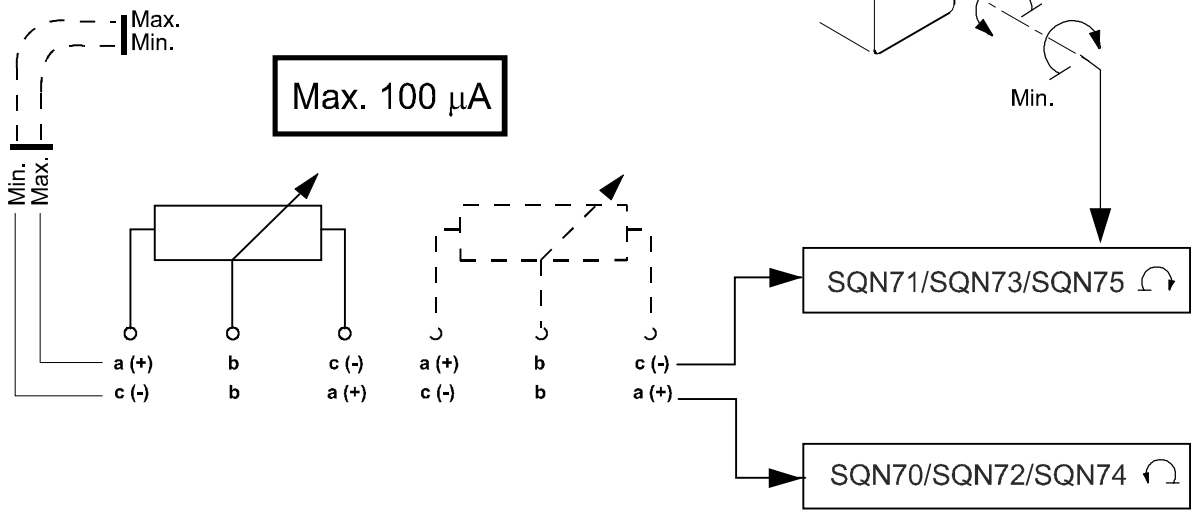
7921z12/0522

7

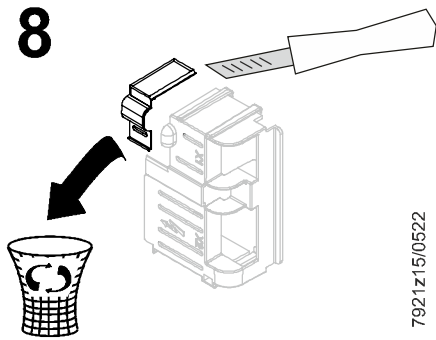


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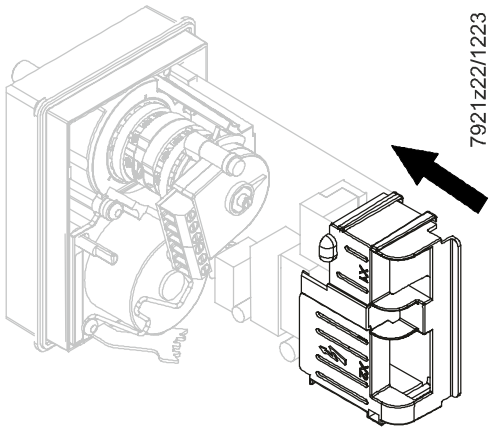
7a



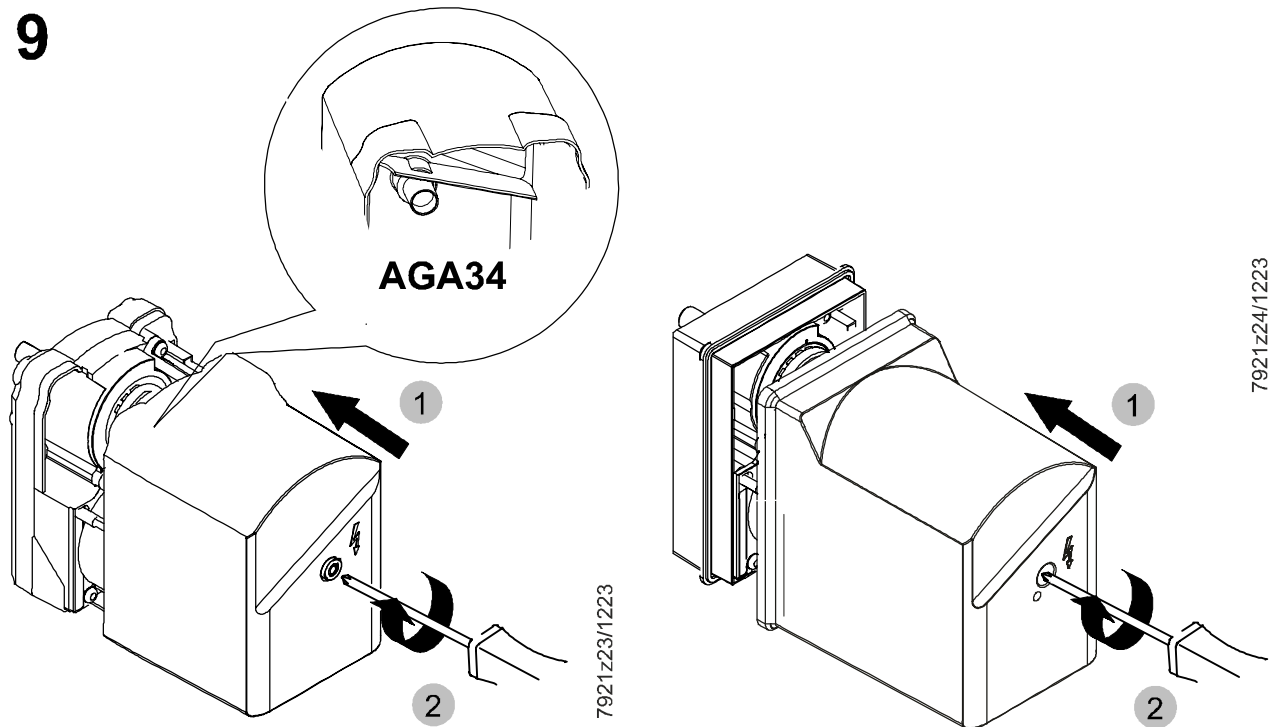
SQN72/SQN73 actuator



SQN72/SQN73 actuator



9



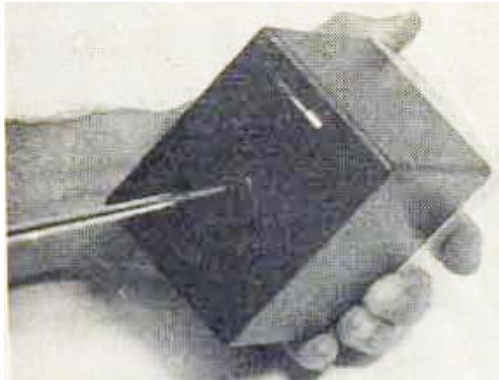
Only actuator ...
SQN7x.x0xxx
SQN7x.x6xxx
SQN7x.x7xxx

- 1 Attach the AGA34 cover.
- 2 Secure the AGA34 cover with screws.

Mounting the ASZxx.7xx/ASZxx.8xx/ASZxx.9xx on the SQN3 actuator

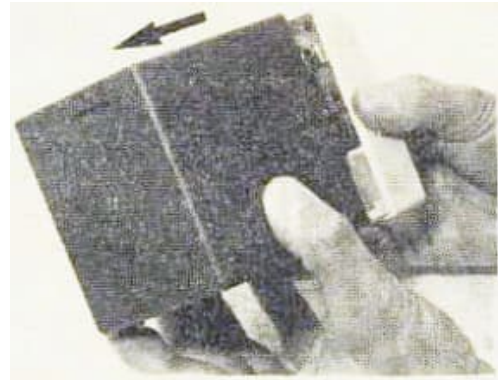
Step 1

Unscrew the SQN3 cover.



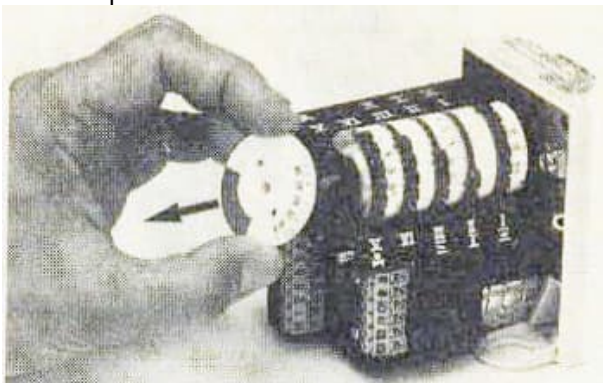
Step 2

Remove the SQN3 cover.



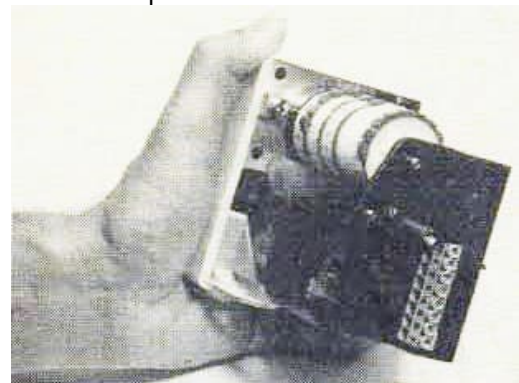
Step 3

Pull off the position indication disk.



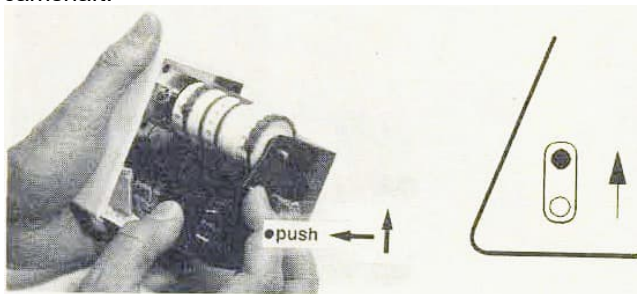
Step 4

Pull off the white spacer sleeve.



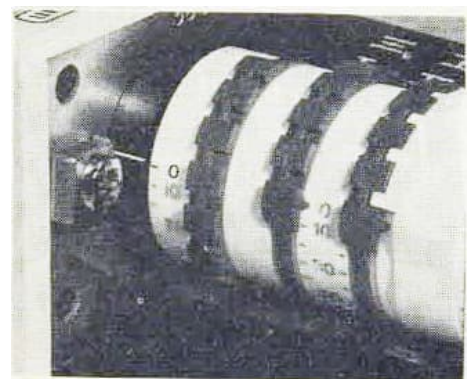
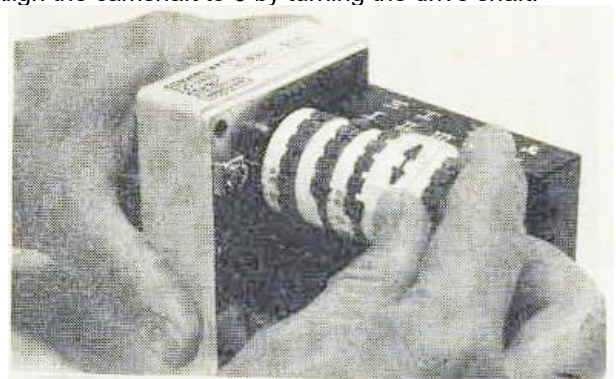
Step 5

Ensure that the camshaft is aligned to position 0. If necessary, set the coupling on the SQN3 to 0 by pressing the coupling downward and toward the camshaft.



Step 6

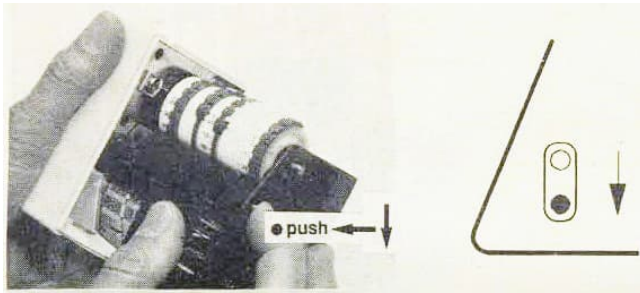
Align the camshaft to 0 by turning the drive shaft.



Mounting the ASZxx.7xx/ASZxx.8xx/ASZxx.9xx on the SQN3 actuator (continued)

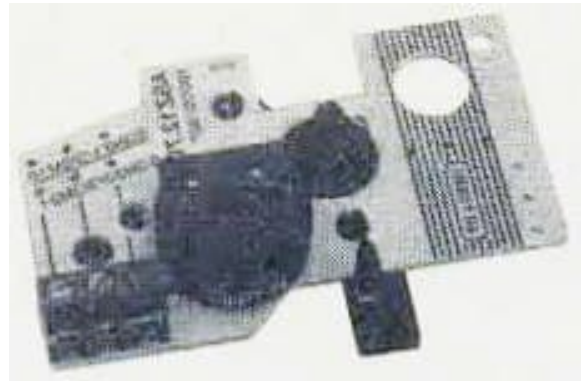
Step 7

Press the coupling downward again and away from the camshaft, then release the coupling.



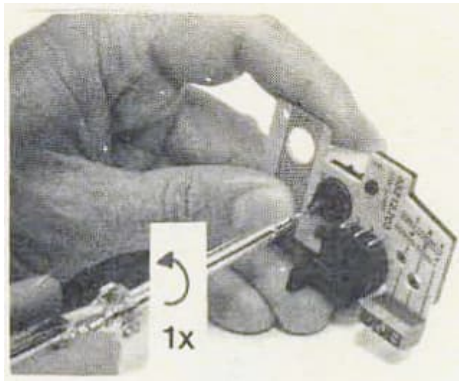
Step 8

Remove the ASZ from the packaging and pull the adhesive strip off the potentiometer.



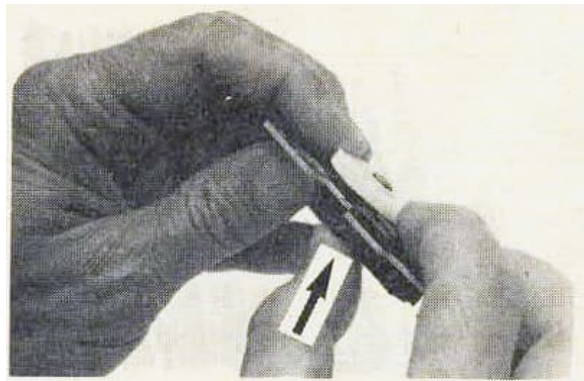
Step 9

Remove the screw from the potentiometer and turn the potentiometer over.



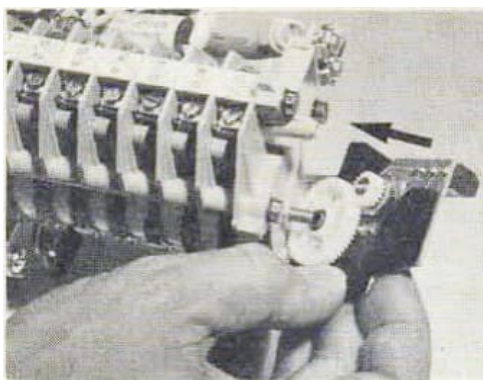
Step 10

Remove the brass sleeve from the potentiometer.



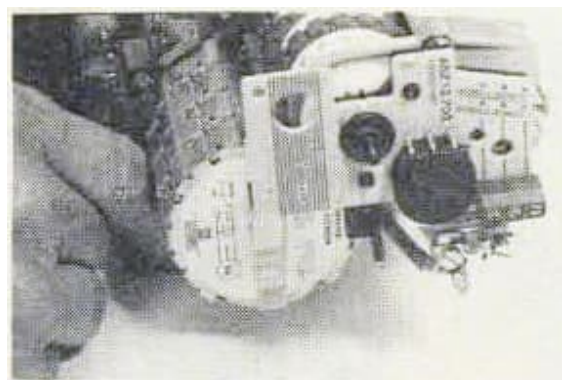
Step 11

Push the potentiometer onto the SQN3.



Step 12

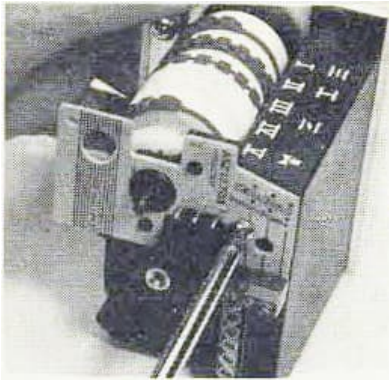
Push the brass sleeve onto the potentiometer.



Mounting the ASZxx.7xx/ASZxx.8xx/ASZxx.9xx on the SQN3 actuator (continued)

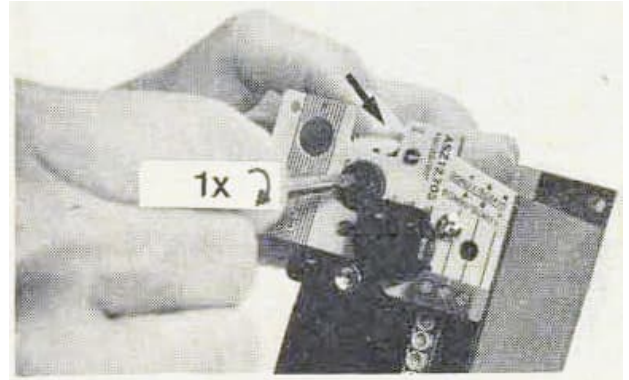
Step 13

Secure the brass sleeve again with screws.



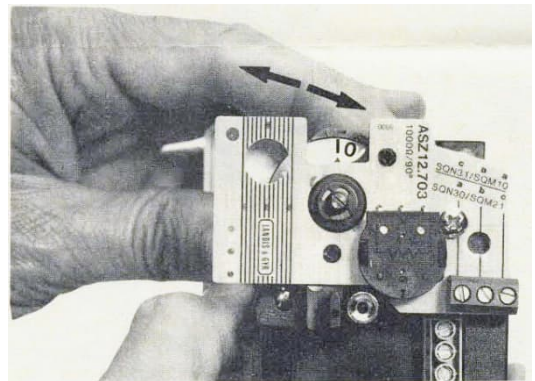
Step 14

Secure the potentiometer with screws.



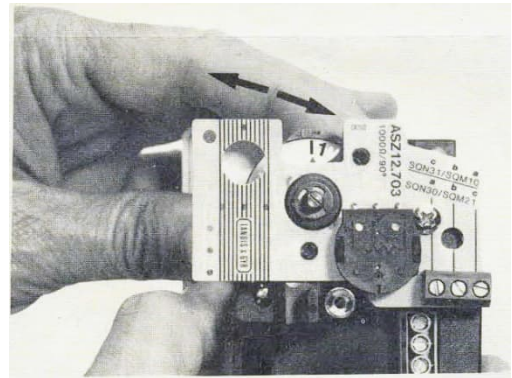
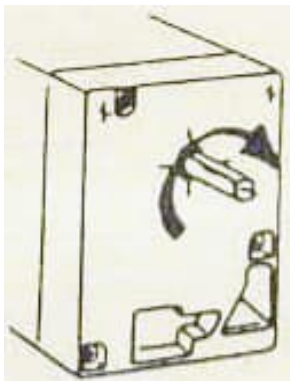
Step 14 a

SQN30 position = cam 0 + potentiometer 0.



Step 14 b

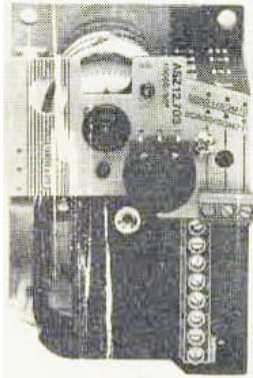
SQN31 position = cam 0 + potentiometer 1.



Mounting the ASZxx.7xx/ASZxx.8xx/ASZxx.9xx on the SQN3 actuator (continued)

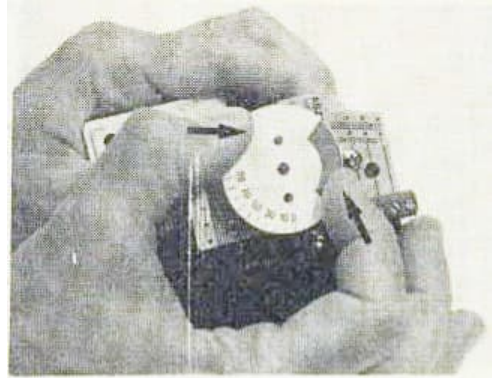
Step 15

Press the disk for the position indication on.

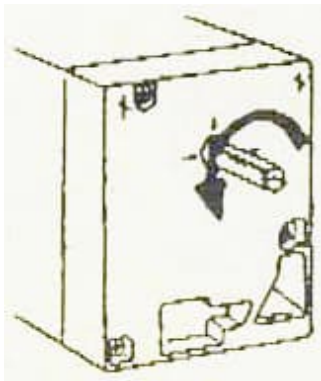


Step 16

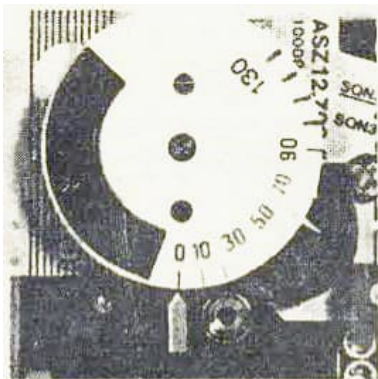
Check the alignment of the disk.



Step 16 a SQN30



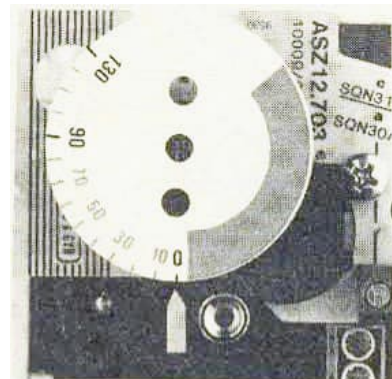
90°/130°



Step 16 b SQN31

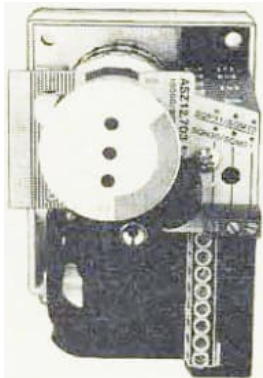


90°/130°



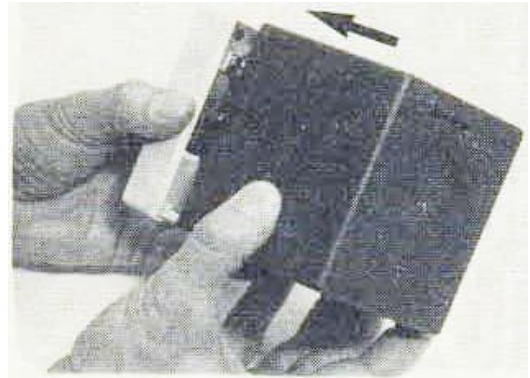
Step 17

Secure the potentiometer screw.



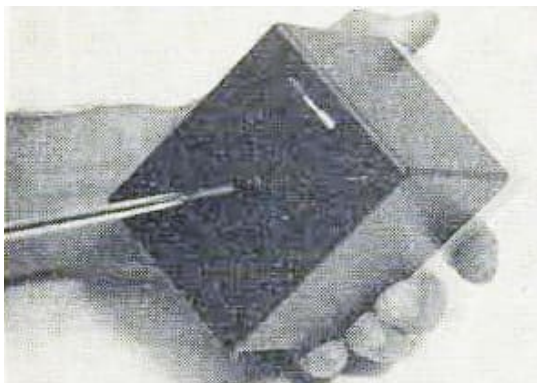
Step 18

Slide the cover back onto the SQN3.



Step 19

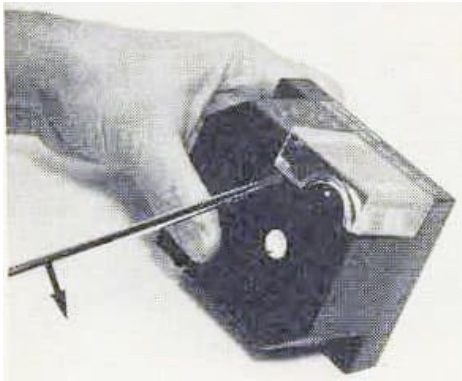
Secure the cover again with screws



Mounting the ASZxx.7xx/ASZxx.8xx/ASZxx.9xx on the SQN9x actuator

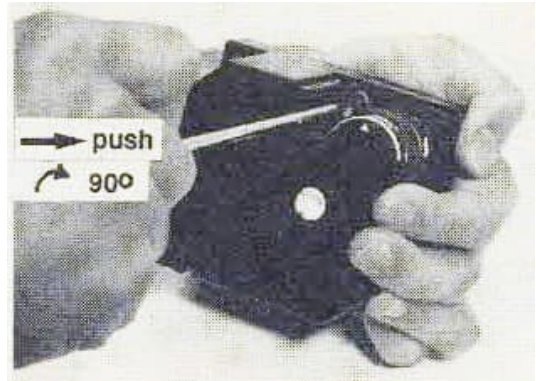
Step 1

Use a tool to remove the cover.



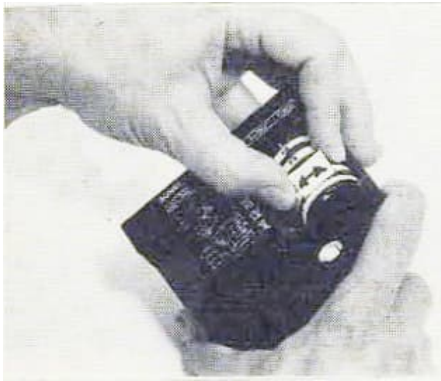
Step 2

Use a tool to press the pin and rotate it 90° clockwise.

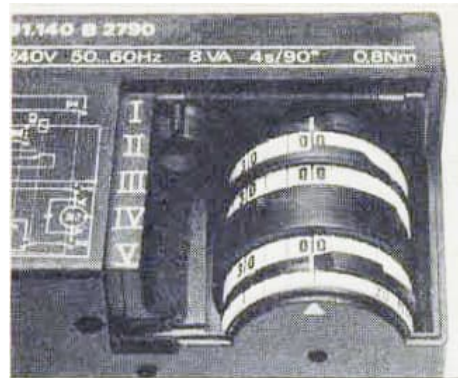


Step 3

Align the camshaft to the zero position.

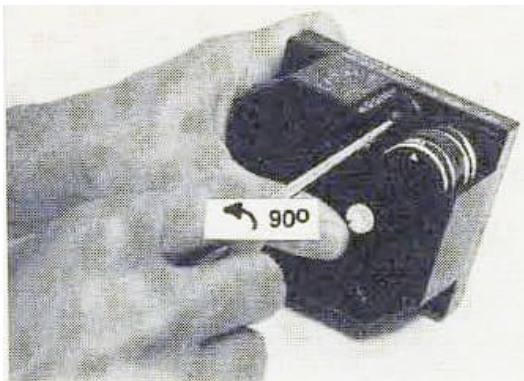


Step 4



Step 5

Use a tool to rotate the pin 90° counterclockwise.

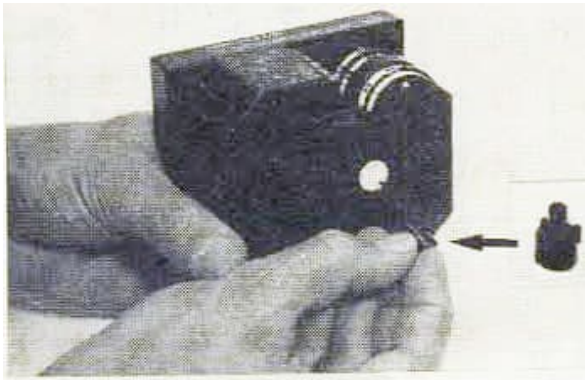


Step 6

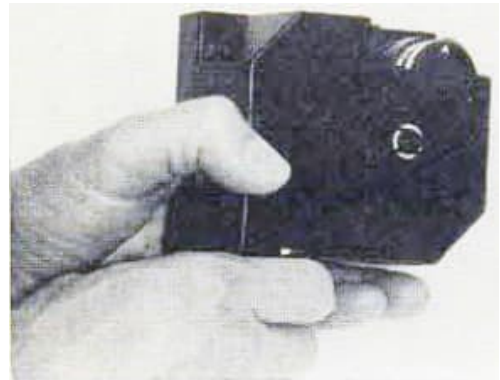
Remove the AGA09 from the packaging.



Step 7



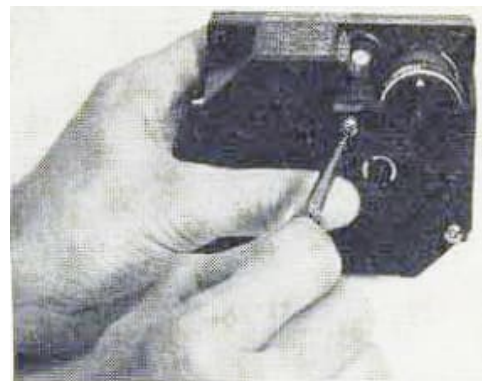
Step 8



Step 9

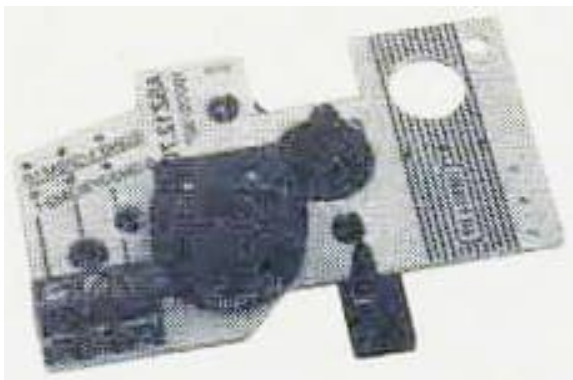


Step 10



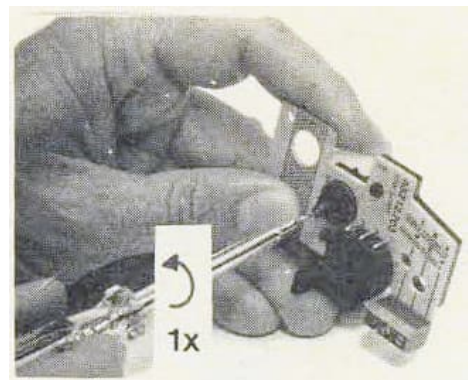
Step 11

Remove the ASZ from the packaging and pull the adhesive strip off the potentiometer.



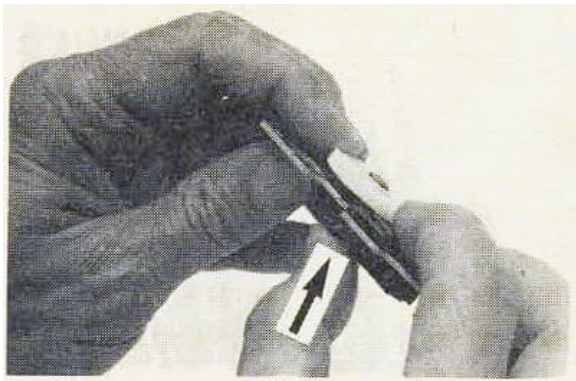
Step 12

Remove the screw from the potentiometer and turn the potentiometer over.



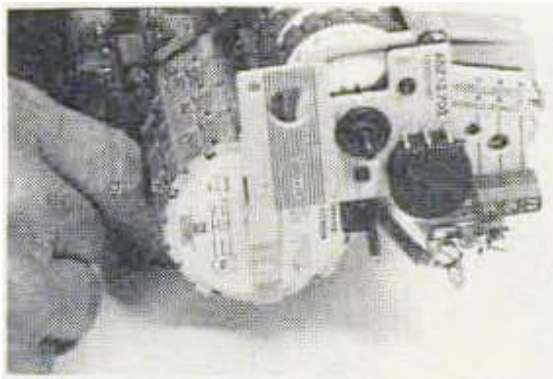
Step 13

Remove the brass sleeve from the potentiometer.



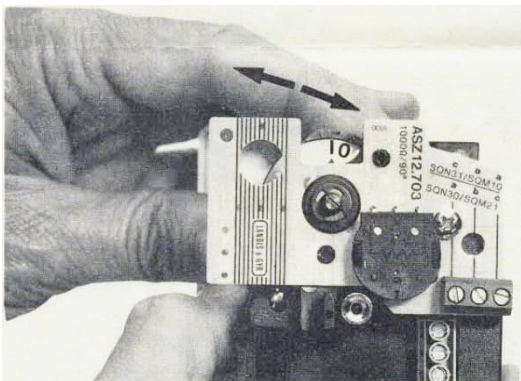
Step 15

Push the brass sleeve onto the potentiometer.



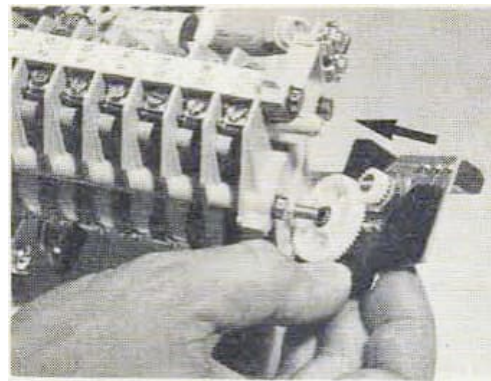
Step 17 a

SQN90 position = potentiometer 0.



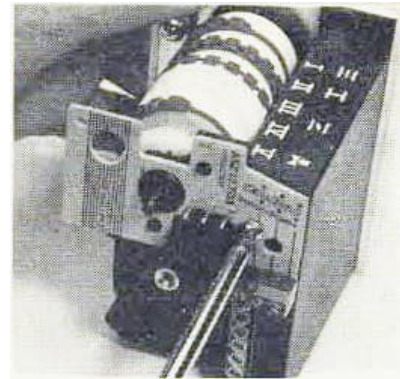
Step 14

Push the potentiometer onto the SQN9.



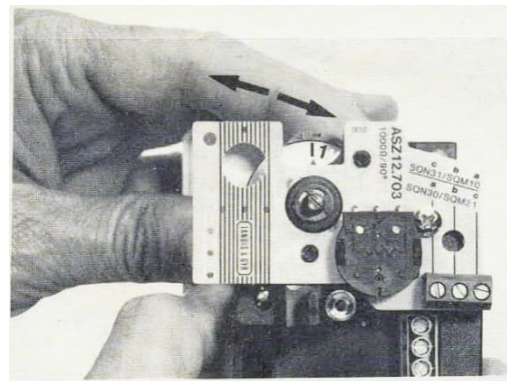
Step 16

Secure the brass sleeve again with screws.



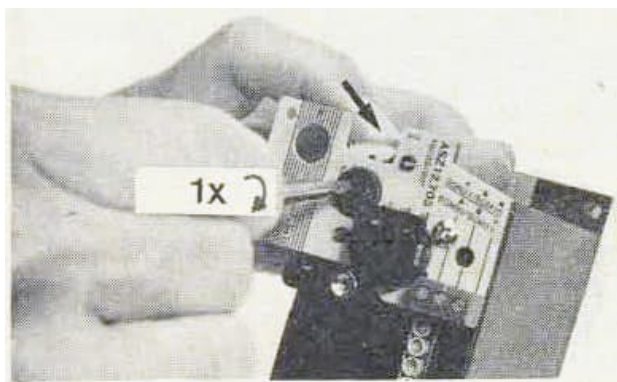
Step 17 b

SQN91 position = potentiometer 1.



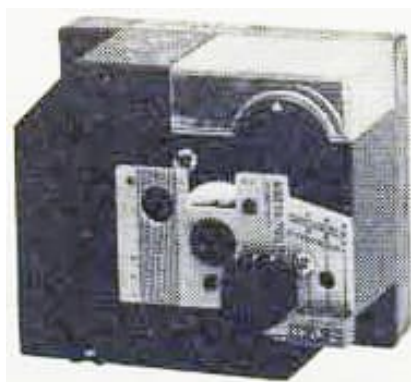
Step 18

Secure the potentiometer with screws.



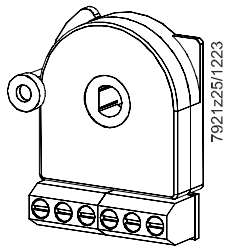
Step 19

Fit the cover.



Mounting the ASZ22.3x on the SQM4 actuator

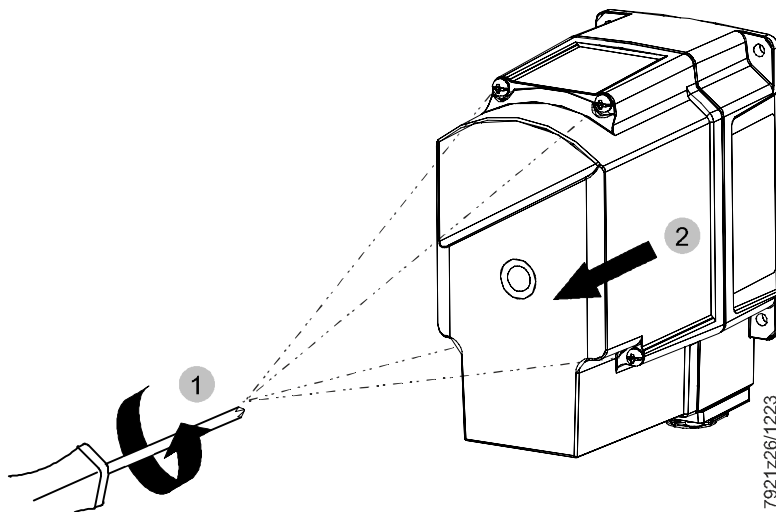
Double potentiometer (2x 1000 Ω)



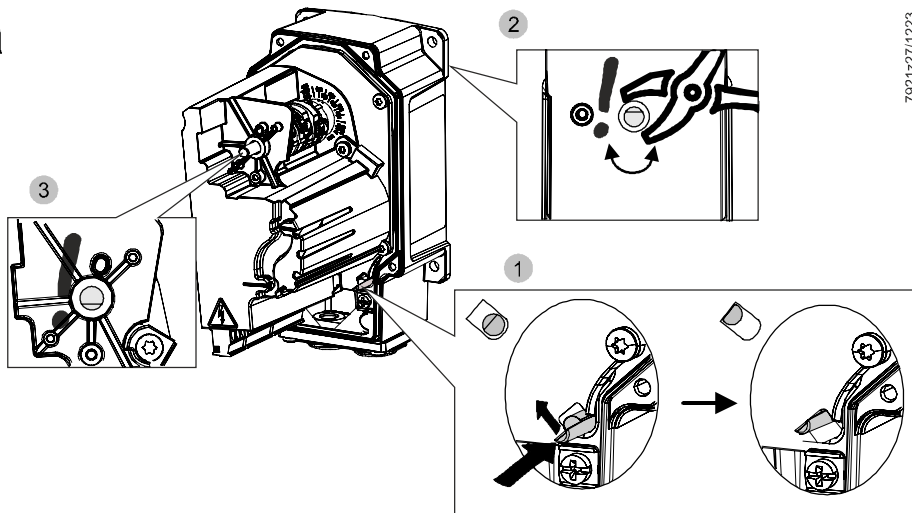
16 mm

	Actuators
ASZ22.32 →	SQM4x.xxxx0
ASZ22.34 →	SQM41.xxxx0
ASZ22.35 →	SQM40.xxxx0

1

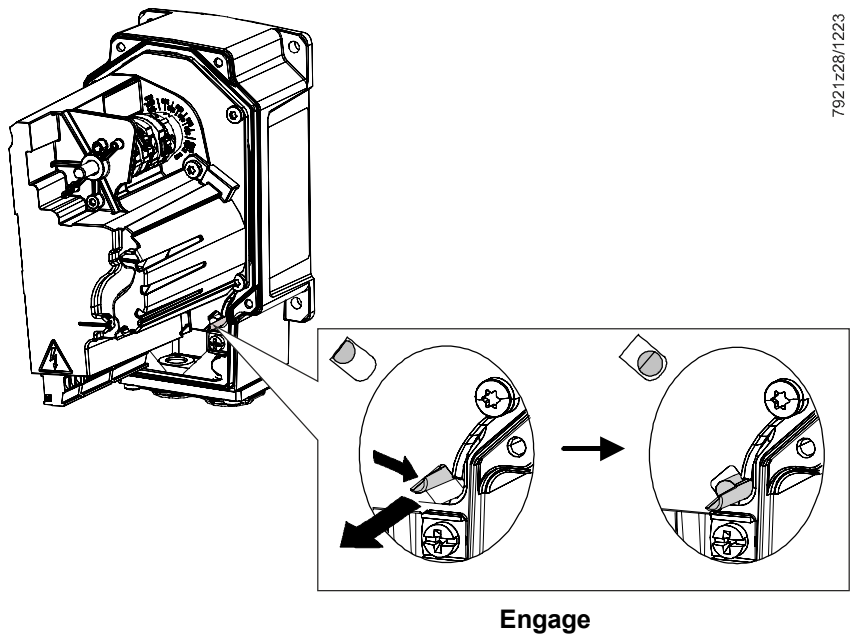


2a

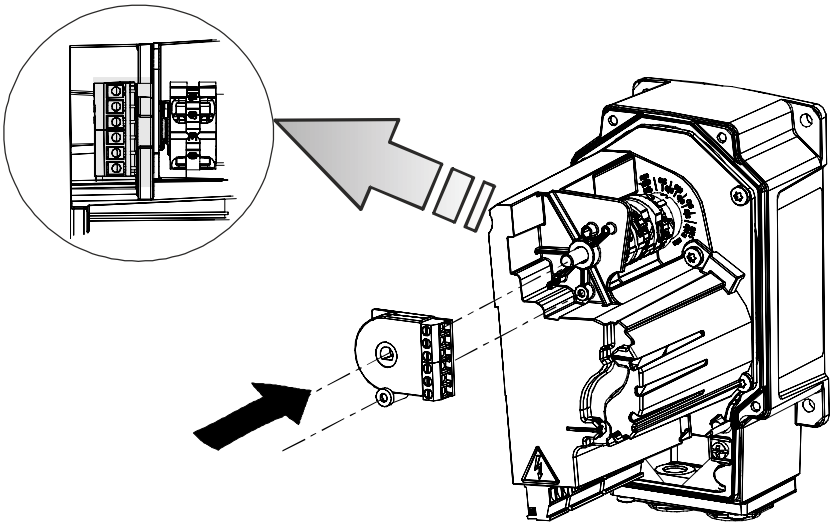


- 1 Disengage
- 2 Rotate the shaft
- 3 Rotate the shaft until the flat side is at the bottom

2b

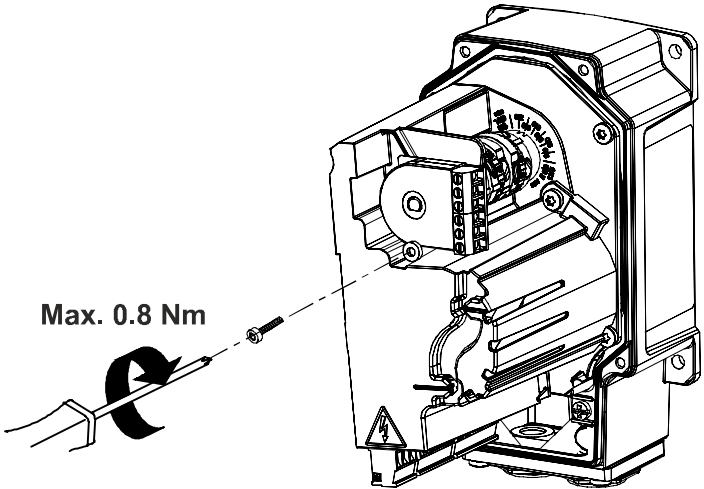


3

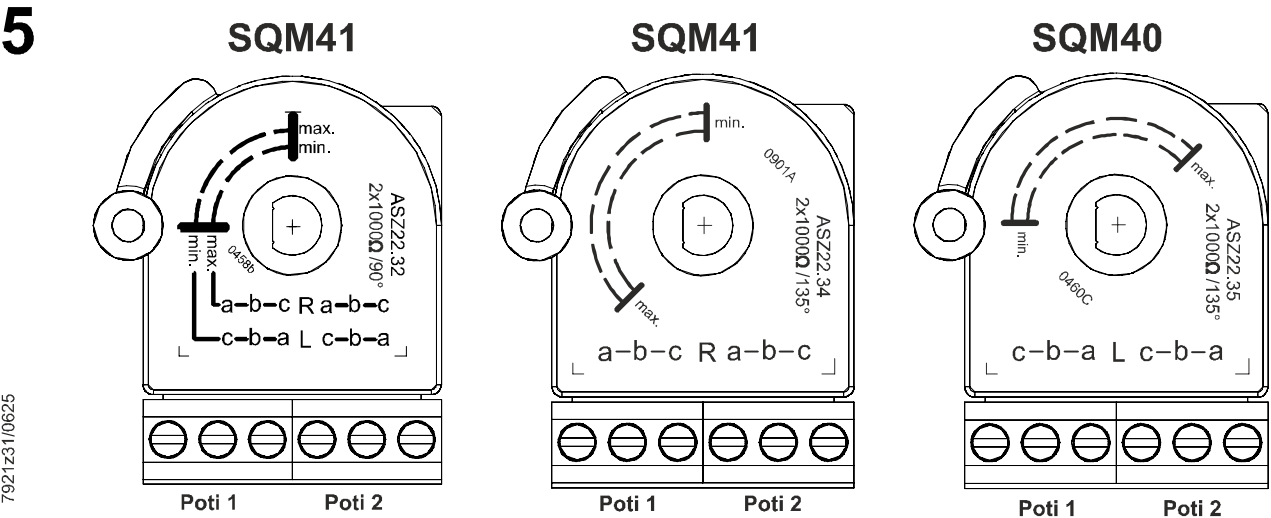


Push the ASZ22.3x onto the shaft as far as it will go

4

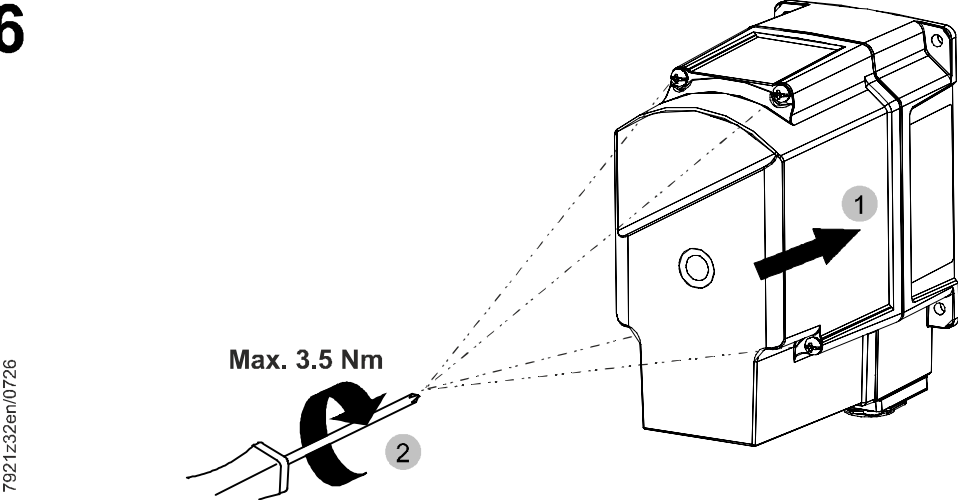


5



7921z31/0625

6



7921z32en/0726