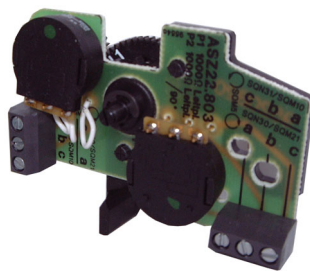


ASZxx.7xx / ASZxx.8xx



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 ASZ potentiometers are specially designed for fitting to the drive shafts of SQM 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 actuators in combination with electronic fuel/air ratio control systems or SQM5 actuators together with AGA56 electronic function modules, conductive plastic potentiometers are mandatory (extended lifetime and better 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
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

## 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 potentiometers 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!



EAC conformity (Eurasian conformity)



ISO 9001:2015  
ISO 14001:2015  
OHSAS 18001:2007



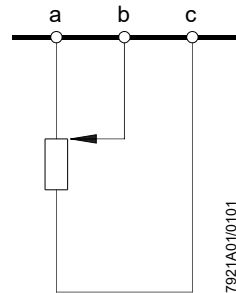
China RoHS  
Hazardous substances table:  
<http://www.siemens.com/download?A6V10883536>

## Disposal notes

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

## Engineering notes

Connection diagram



The ASZ potentiometer shown in 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”.

Conductive plastic ASZ potentiometers can be destroyed if operating voltage is applied between “a → b” or “b → c”.

For SQM40/SQM41 actuators

If the ASZ potentiometer 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°.

ASZ22.32:

The 90° design can be configured for both directions of rotation (SQM40 (counterclockwise) and SQM41 (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 potentiometer must correspond with the direction of rotation of the SQM4x actuator as follows:

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

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 <sup>2)</sup> , SQN4, SQN90 / SQN91 <sup>5)</sup>	SQN7 <sup>3)</sup> SQM1, SQM2 <sup>4)</sup> SQM5	SQM40	SQM41
Material	Angular rotation	Resistance	Type reference				
<b>Single potentiometer</b>							
Wire or cermet	90°	135 Ω	<b>ASZ16.703</b>	<b>ASZ16.703</b>	---	---	---
		220 Ω	<b>ASZ8.703</b>	<b>ASZ8.703</b>	---	---	---
		1000 Ω	<b>ASZ12.703</b>	<b>ASZ12.703</b>	---	---	---
	135°	135 Ω	<b>ASZ16.733</b> <sup>1)</sup>	<b>ASZ16.733</b> <sup>1)</sup>	---	---	---
		220 Ω	<b>ASZ8.733</b>	<b>ASZ8.733</b>	---	---	---
		1000 Ω	<b>ASZ12.733</b>	<b>ASZ12.733</b>	---	---	---
Conductive plastic	90°	1000 Ω	<b>ASZ12.803</b>	<b>ASZ12.803</b>	<b>ASZ12.30</b>	---	---
	135°	1000 Ω	<b>ASZ12.833</b>	<b>ASZ12.833</b>	<b>ASZ12.33</b>	---	---
<b>Double potentiometer</b>							
Wire or cermet	90°	1000 / 1000 Ω	<b>ASZ22.703</b>	<b>ASZ22.703</b>	---	---	---
		135 / 135 Ω	<b>ASZ66.703</b>	<b>ASZ66.703</b>	---	---	---
		1000 / 550 Ω	<b>ASZ72.703</b>	<b>ASZ72.703</b>	---	---	---
	135°	220 / 220 Ω	<b>ASZ88.733</b> <sup>1)</sup>	<b>ASZ88.733</b> <sup>1)</sup>	---	---	---
		1000 / 220 Ω	<b>ASZ82.733</b> <sup>1)</sup>	<b>ASZ82.733</b> <sup>1)</sup>	---	---	---
		1000 / 1000 Ω	<b>ASZ22.733</b>	<b>ASZ22.733</b>	---	---	---
Conductive plastic	90°	1000 / 1000 Ω	<b>ASZ22.803</b>	<b>ASZ22.803</b>	<b>ASZ22.30</b>	<b>ASZ22.32</b>	<b>ASZ22.32</b>
	135°	1000 / 1000 Ω	<b>ASZ22.833</b>	<b>ASZ22.833</b>	<b>ASZ22.33</b>	<b>ASZ22.35</b>	<b>ASZ22.34</b>
Wire or cermet / conductive plastic	90°	1000 / 1000 Ω	<b>ASZ22.903</b>	<b>ASZ22.903</b>	---	---	---
	135°	1000 / 1000 Ω	<b>ASZ22.933</b>	<b>ASZ22.933</b>	---	---	---

<sup>1)</sup> Only available on request

<sup>2)</sup> Only with a high AGA34 cover, refer to Data Sheet N7808 and *Accessories*

<sup>3)</sup> Design with a high AGA34 cover, refer to Data Sheet N7804:

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

<sup>4)</sup> Not for actuators with external position indication

<sup>5)</sup> Only with additional AGA09 fixing unit, refer to *Accessories*

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:ASZ72.703	ASZ72.703
BPZ:ASZ82.733	ASZ82.733
BPZ:ASZ88.733	ASZ88.733

**ASZx potentiometer**

Refer to *Type summary*

- ASZxx.3x Refer to Mounting Instruction 4 319 9604 0 (M7921)
- ASZxx.7xx Refer to Mounting Instruction 4 319 2263 0 (M7806 / M7808 / M7812)
- ASZxx.8xx Refer to Mounting Instruction 4 319 2263 0 (M7806 / M7808 / M7812)
- ASZxx.9xx Refer to Mounting Instruction 4 319 2263 0 (M7806 / M7808 / M7812)
- ASZ22.3x Refer to Mounting Instruction 74 319 0921 0 (M7921)

## Accessories (must be ordered separately)

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### Potentiometer fixing

**AGA09**

Article no.: **BPZ:AGA09**

(only for ASZxx.7xx and ASZxx.8xx)  
For use with SQN9.

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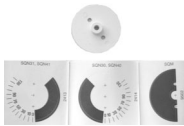
### Conversion kit

**AGA32**

Article no.: **BPZ:AGA32**

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

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### Service kit

**AGA33**

Article no.: **BPZ:AGA33**

(Only for ASZxx.7xx and ASZxx.8xx potentiometers)

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



### Cover

**AGA34**

Article no.: **BPZ:AGA34**

For retrofitting an SQN70 / SQN71 actuator with ASZxx.3xx potentiometer

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

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

## Technical data

General unit data	Potentiometer type	ASZxx.7xx ASZxx.8xx ASZxx.9xx	ASZxx.3x
	Operating voltage		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 <sup>2</sup>	0.5 to 1 mm <sup>2</sup>
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	<b>Storage</b>	DIN EN 60721-3-1	DIN EN 60721-3-1
	Climatic conditions	Class 1K3	Class 1K3
	Mechanical conditions	Class 1M2	Class 1M2
	Temperature range	-20 to +60°C	-20 to +60°C
	Humidity	< 95% r.h.	< 95% r.h.
	<b>Transport</b>	DIN EN 60721-3-2	DIN EN 60721-3-2
	Climatic conditions	Class 2K2	Class 2K3
	Mechanical conditions	Class 2M2	Class 2M2
	Temperature range	-50 to +75°C	-50 to +75°C
	Humidity	< 95% r.h.	< 95% r.h.
	<b>Operation</b>	DIN EN 60721-3-3	DIN EN 60721-3-3
	Climatic conditions	Class 3K3	Class 3K3
	Mechanical conditions	Class 3M3	Class 3M3
	Temperature range	-20 to +70°C	-20 to +70°C
	Humidity	< 95% r.h.	< 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
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

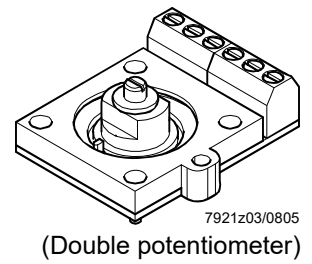
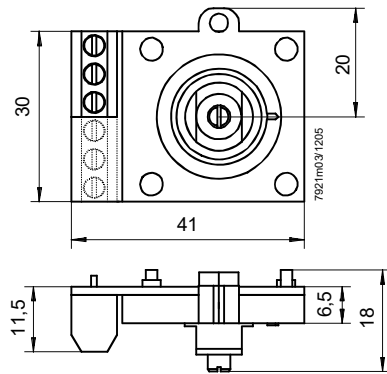


# Dimensions

Dimensions in mm

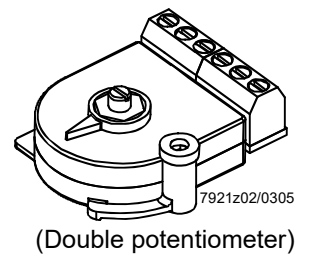
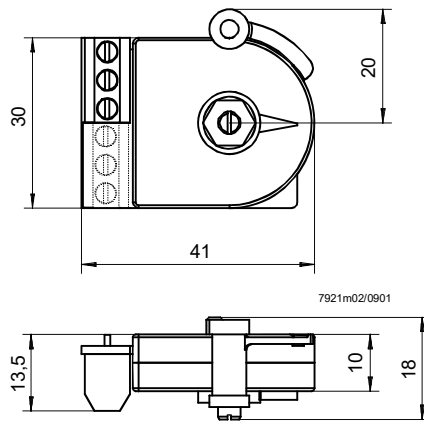
## ASZxx.3x

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



Alternative design of  
ASZxx.3x

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



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

