



SQM5..., gear train side  
with drive shaft no. 7



SQM5..., rear, version without  
second drive shaft end



SQM5..., rear, version with  
2 drive shaft ends

## Damper Actuators

## SQM5...

with electronic modules

- Reversible electromotoric actuators delivering torques up to 40 Nm
- Running times from 10 to 90 seconds
- With 1 or 2 drive shaft ends; drive shafts are available as separate items and can be exchanged
- Can be equipped with electronic modules for control and position indication
- Internal and external position indication
- Drive shaft and cam shaft can be separately disengaged
- Choice of UL-listed types for use in the U.S. and Canada
- Supplementary Data Sheets: N7921 and N7922

The SQM5... and this Data Sheet are intended for use by OEMs which integrate the air damper actuators in their products!

### Use

The SQM5... actuators are used to drive gas or air dampers of oil and gas burners of medium to large capacity.

They are used primarily for load-dependent control of the amounts of gas, oil and combustion air:

- In connection with 3-position or modulating controllers (e.g. 4...20 mA), or
- Directly by burner controls

## Warning notes

---



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

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

- Before performing any wiring changes in the connection area of the actuator, completely isolate the equipment from the mains supply (all-polar disconnection)
- Ensure protection against electric shock hazard by providing adequate protection for the connection terminals
- Protection against electric shock hazard is ensured by a hinged plastic cover, allowing safe setting of the cams when mains voltage is present
- Check to ensure that wiring is in an orderly state
- Fall or shock can adversely affect the safety functions. Such actuators may not be put into operation even if they do not exhibit any damage

## Mounting notes

---

- Ensure that the relevant national safety regulations are complied with

## Installation notes

---

- Prior to commissioning, check to ensure that wiring is in an orderly state

## Norms and certificates

---



Conformity to EEC directives  
- Electromagnetic compatibility EMC (immunity)  
- Low-voltage directive

89 / 336 EEC  
73 / 23 EEC



ISO 9001: 2000  
Cert. 00739



ISO 14001: 1996  
Cert. 38233



## Service notes

---

- Each time an actuator has been replaced, check to ensure that wiring is in an orderly state

## Disposal notes

---



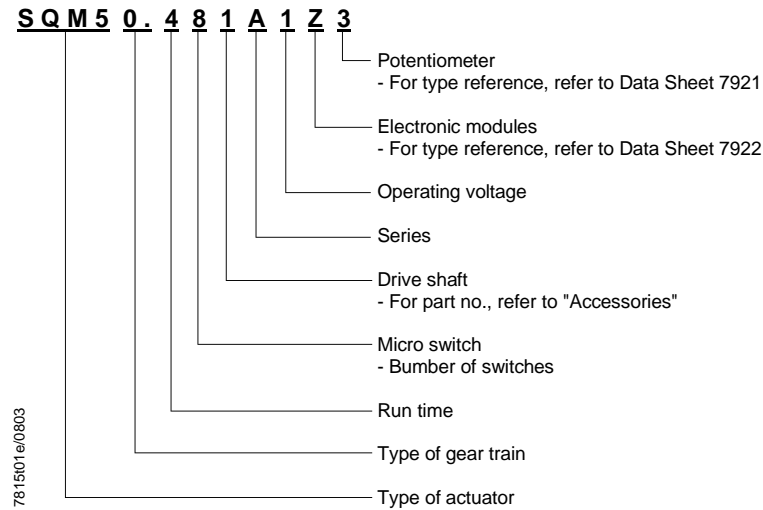
The actuator contains electrical and electronic components and may not be disposed of together with household waste.  
Local and currently valid legislation must be observed.

## Mechanical design

---

Housing	<ul style="list-style-type: none"><li>• Housing sections made of die-cast aluminium</li><li>• Covers made of impact-proof and heat-resistant plastic</li></ul>
Drive motor	<ul style="list-style-type: none"><li>• Reversible and locking-proof synchronous motor</li></ul>
Couplings	<ul style="list-style-type: none"><li>• Drive shaft and cam shaft can be adjusted separately, independent of the gear train</li></ul>
Cam shaft drive	<ul style="list-style-type: none"><li>• Nearly backlash-free</li></ul>
Adjustment of switching points	<ul style="list-style-type: none"><li>• With adjustable cams</li><li>• Scales beside the cams indicate the angle of the switching point</li></ul>
Position indication	<ul style="list-style-type: none"><li>• Internally:<ul style="list-style-type: none"><li>– Scale at the end of the drive shaft</li><li>– Black scale for counterclockwise rotation, single arrow on the cam</li><li>– Red scale for clockwise rotation, double arrow on the cam</li></ul></li><li>• Externally:<ul style="list-style-type: none"><li>– Scale in viewing window</li></ul></li></ul>
Electrical connections	<ul style="list-style-type: none"><li>• Micro switch with tabs</li><li>• Screw terminals for «N» and «PE»</li><li>• Possibility of premounting and fixing wiring by means of removable Pg plastic insert</li><li>• Easy introduction of cables through large openings in the housing</li><li>• Fixing of Pg insert with all cables by means of a screw</li></ul>
Gear train	<ul style="list-style-type: none"><li>• Maintenance-free gearwheels and bearings</li></ul>
Drive shaft	<ul style="list-style-type: none"><li>• Secured with a removable circlip</li><li>• Easily exchangeable</li><li>• Choice of drive shaft on both sides</li></ul>
Actuator fixing	<ul style="list-style-type: none"><li>• Fixing holes on the front of the housing and at the bottom</li><li>• Front fixing also possible from inside the housing</li><li>• Variable mounting height through the use of an extra adapter</li></ul>

**Type code (do not use for ordering)**



**Type summary** (other types of actuators are available on request)

Running time at 50 Hz <sup>1)</sup> and angular rotation		Auxiliary switches incl. 2 end switches	Type of drive shaft <b>AGA58...</b>	Max. torque and holding torque <sup>3)</sup>	AC 220 V –15 %... AC 240 V +10 % 50...60 Hz ±6 %	AC 100 V –15 %... AC 110 V +10 % 50...60 Hz ±6 %	AC 24 V –15 / +10 % 50...60 Hz ± 6%
90°	130°	Pieces	No.	Nm <sup>2)</sup>	Type reference	Type reference	Type reference
15 s	22 s	4	1	10	<b>SQM50.341A2</b>	--- <sup>4)</sup>	--- <sup>4)</sup>
15 s	22 s	8	<sup>5)</sup>	10	--- <sup>4)</sup>	<b>SQM50.380A1</b> <sup>5)</sup>	--- <sup>4)</sup>
15 s	22 s	8	1	10	<b>SQM50.381A2</b>	--- <sup>4)</sup>	--- <sup>4)</sup> <sup>5)</sup>
34 s	49 s	4	3	15	--- <sup>4)</sup>	--- <sup>4)</sup>	<b>SQM50.443A8</b>
15 s	22 s	4	4	15	--- <sup>4)</sup>	--- <sup>4)</sup>	<b>SQM50.444A8</b>
34 s	49 s	5	4	15	--- <sup>4)</sup>	--- <sup>4)</sup>	<b>SQM50.454A8</b>
34 s	49 s	8	<sup>5)</sup>	15	<b>SQM50.480A2</b>	<b>SQM50.480A1</b> <sup>5)</sup>	--- <sup>4)</sup>
34 s	49 s	8	<sup>5)</sup>	15	<b>SQM50.480A2Z3</b>	<b>SQM50.480A1Z3</b>	--- <sup>4)</sup>
34 s	49 s	8	1	10	<b>SQM50.481A2</b>	--- <sup>4)</sup>	--- <sup>4)</sup>
34 s	49 s	8	1	10	<b>SQM50.481A2Z3</b>	--- <sup>4)</sup>	--- <sup>4)</sup>
34 s	49 s	8	2	15	<b>SQM50.482A2</b>	--- <sup>4)</sup>	--- <sup>4)</sup>
34 s	49 s	8	3	15	<b>SQM50.483A2</b>	--- <sup>4)</sup>	<b>SQM50.483A8</b>
34 s	49 s	8	3	15	<b>SQM50.483A2Z3</b> <sup>8)</sup>	<b>SQM50.483A1Z3</b> <sup>8)</sup>	<b>SQM50.483A8Z3</b> <sup>8)</sup>
60 s	87 s	8	1	10	<b>SQM50.681A2</b>	--- <sup>4)</sup> <sup>5)</sup>	--- <sup>4)</sup> <sup>5)</sup>
30 s	43 s	8	<sup>5)</sup>	25	--- <sup>4)</sup>	SQM53.480A1	--- <sup>4)</sup>
30 s	43 s	8	2	20	<b>SQM53.482A2</b>	--- <sup>4)</sup>	--- <sup>4)</sup>
30 s	43 s	8	2	20	<b>SQM53.482A2Z3</b>	SQM53.482A1Z3	--- <sup>4)</sup>
30 s	43 s	8	9	25	SQM53.489A2	--- <sup>4)</sup>	--- <sup>4)</sup>
45 s	65 s	8	2	20	<b>SQM53.582A2</b>	--- <sup>4)</sup>	--- <sup>4)</sup>
30 s	43 s	8	<sup>5)</sup>	25	<b>SQM54.480A2</b>	--- <sup>4)</sup>	--- <sup>4)</sup>
30 s	43 s	8	2	20	<b>SQM54.482A2</b> <sup>6)</sup>	--- <sup>4)</sup>	--- <sup>4)</sup>
45 s	65 s	8	<sup>5)</sup>	25	<b>SQM54.580A2</b> <sup>6)</sup>	--- <sup>4)</sup>	--- <sup>4)</sup>
60 s	87 s	8	<sup>5)</sup>	40	SQM56.680A2	--- <sup>4)</sup>	--- <sup>4)</sup>
60 s	87 s	8	4	30	SQM56.684A2Z3	--- <sup>4)</sup>	--- <sup>4)</sup>
60 s	87 s	8	7	40	SQM56.687A2	SQM56.687A1	--- <sup>4)</sup>
60 s	87 s	8	7	40	<b>SQM56.687A2Z3</b> <sup>8)</sup>	<b>SQM56.687A1Z3</b> <sup>8)</sup>	--- <sup>4)</sup>

- 1) At 60 Hz frequency, running times are about 17 % shorter
- 2) Based on 250,000 position changes
- 3) Refer to «Drive shafts» and «Torques», depending on voltage
- 4) Voltage version on request
- 5) Drive shaft to be ordered separately

- 6) With reduced backlash, specifically for RVW... / RPO... applications or electronic fuel / air ratio control
- 7) With premounted potentiometer ASZ12.803
- 8) With premounted electronic module AGA56.9 and potentiometer ASZ12.803

## Ordering

When ordering, please give type reference according to «Type summary».  
Accessories are to be ordered separately.  
Actuators with premounted accessories are only available on request.

## Accessories

**Potentiometers ASZ...** refer to Data Sheet 7921

### Mounting kit

**ASK33.9**

- For fitting the SQM5... to butterfly valves VKF41... , always with drive shaft AGA58.1

### Spacer

**AGA57.1**

- Adapter for SQM10... / SQM20...

### Adapter for actuator ME8

**AGA57.2**

### Adapter for Honeywell Mod. III actuator

**AGA57.3**

### Electronic modules

refer to Data Sheet 7922

- For control of the actuator
- For integration into the actuator, complete with mounting frame and fixing screws

### Drive shafts

Type of drive shaft	Max. torque	Part no.	Type reference
<b>10 mm dia., single-sided</b> , Woodruff key to DIN 6888, drive shaft of SQM10...	10 Nm	1	<b>AGA58.1</b>
<b>12 mm dia., single-sided</b> , Woodruff key to DIN 6888, drive shaft of SQM20...	20 Nm	2	<b>AGA58.2</b>
<b>9 mm square, double-sided</b> , drive shaft of ME8	25 Nm	3	<b>AGA58.3</b>
<b>9.5 mm square, double-sided</b> , drive shaft of Honeywell Mod. III	30 Nm	4	<b>AGA58.4</b>
<b>14 mm dia., single-sided</b> , parallel key to DIN 6885, mandatory with SQM56...	40 Nm	7	<b>AGA58.7</b>
<b>12 mm square, single-sided</b>	30 Nm	9	<b>AGA58.9</b>

### Potentiometers:

Design / angular rotation	Resistance	Part no.	Type reference
Single wire-wound potentiometer / 90°	1000 Ω	1	<b>ASZ12.703</b>
Single wire-wound potentiometer / 135°	1000 Ω	2	<b>ASZ12.733</b>
Double wire-wound potentiometer / 90°	2 x 1000 Ω	5	<b>ASZ22.703</b>
Double wire-wound potentiometer / 135°	2 x 1000 Ω	6	<b>ASZ22.733</b>
Single conductive plastic potentiometer / 90°	1000 Ω	3	<b>ASZ12.803</b>
Single conductive plastic potentiometer / 135°	1000 Ω	4	<b>ASZ12.833</b>
Double conductive plastic potentiometer / 90°	2 x 1000 Ω	7	<b>ASZ22.803</b>
Double conductive plastic potentiometer / 135°	2 x 1000 Ω	8	<b>ASZ22.833</b>

Other types of potentiometers are available on request!

## Technical data

General data	Current	AC
	Operating voltage and frequency	refer to «Type summary»
	Type of drive motor	synchronous motor
	Power consumption	20 VA
	Angular rotation	adjustable between 0 and 160° (scale range)
	Mounting position	optional
	Degree of protection	IP 54 (provided knockout holes remain closed for mounting or are closed off, with adequate cable entries)
	Cable entry	4 x Pg13.5 (threaded) 2 x Pg13.5 (unthreaded)
	Direction of rotation	facing the gear train side: counterclockwise or clockwise (selectable), standard: <b>counterclockwise</b>
	Torque	refer to torque charts and drive shafts
	Holding torque	max. torque
	Running time	10...90 s (refer to «Type summary»)
	End and auxiliary switches	
	- Type	to DIN 41636
	- Breaking voltage	AC 24...250 V
	- Switching capacity	to CEE 24 / VDE 0630 7.5 (3) A, AC 250 V
	Number of end switches	2
	Number of auxiliary switches	max. 6
	Drive shaft	exchangeable
	Weight	approx. 3.3 kg

## Norms and standards

### Environmental conditions

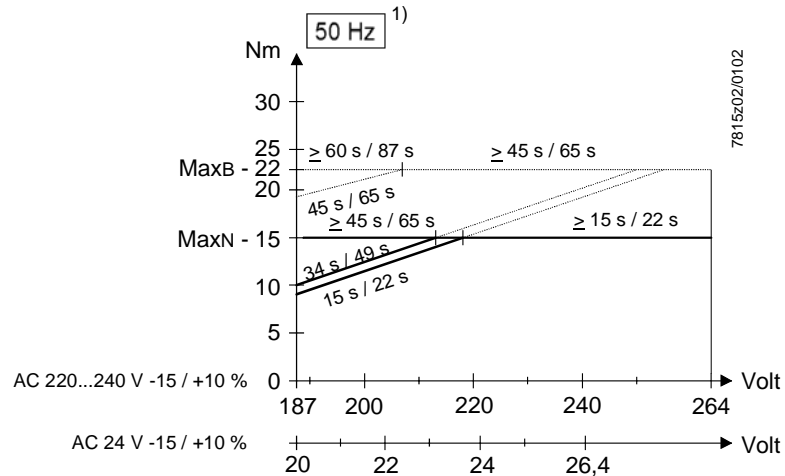
<b>Transport</b>	DIN EN 60 721-3-2
Climatic conditions	class 2K2
Mechanical conditions	class 2M2
Temperature range without integrated electronic modules	-50...+60 °C
Humidity	< 95 % r.h.
<b>Operation</b>	DIN EN 60 721-3-3
Climatic conditions	class 3K5
Mechanical conditions	class 3M2
Temperature range without integrated electronic modules	-20...+60 °C
Humidity	< 95 % r.h.



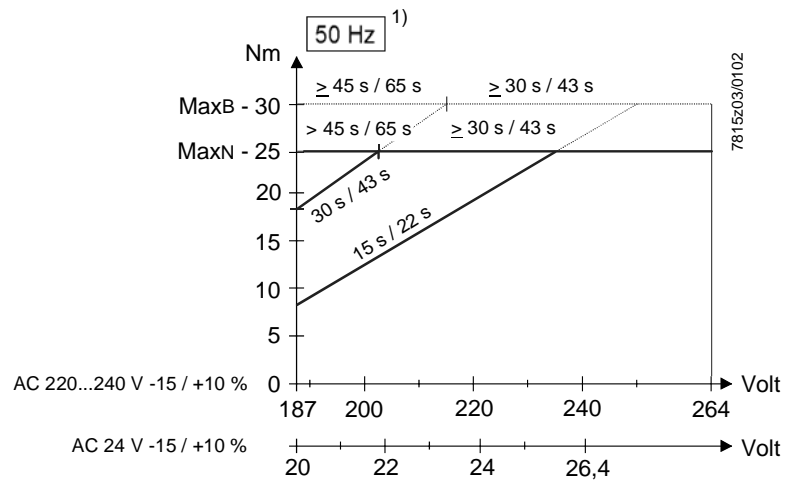
**Condensation, formation of ice and ingress of water are not permitted!**

## Torques

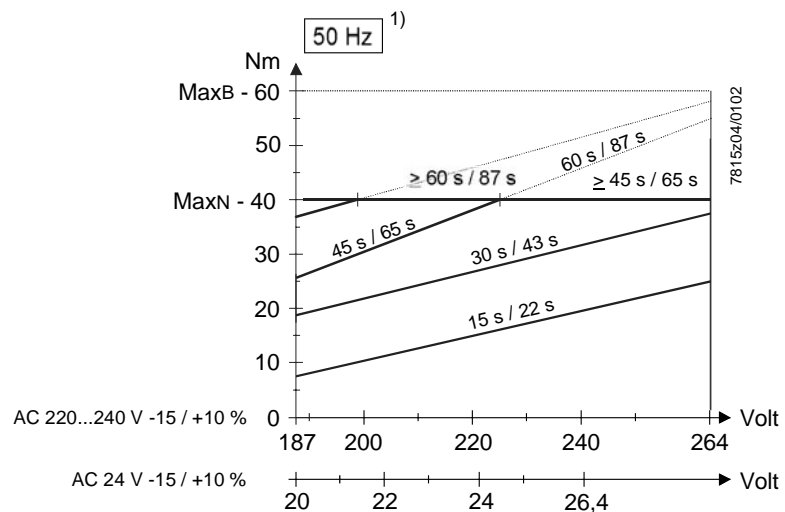
SQM50...



SQM53... / 54...



SQM56...



Legend

1) At 60 Hz frequency, running times are about 17 % shorter and torques are proportionally lower



Each drive side is capable of delivering the maximum torque, but the total torque of both sides may not exceed the maximum permissible torque.

With appropriate running time for 90° / 130°:

— Torque in continuous operation

- - - - - Release or starting torque = short-time torque

MaxN Max. permissible torque in continuous operation for all running times

MaxB Max. permissible release or starting torque for all running times

## Connection terminals

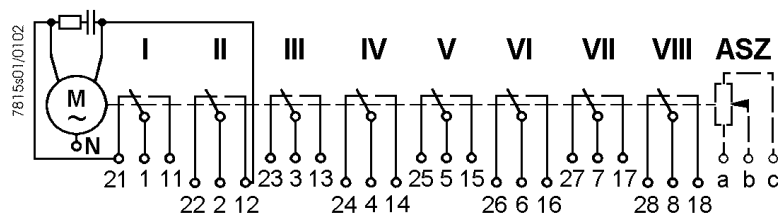
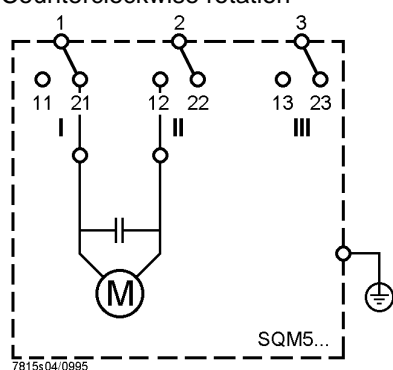


Diagram shows the maximum number of switches (2 end and 6 auxiliary switches). On versions with fewer than 6 auxiliary switches, the higher numbers are not used. For example, the actuator version with 2 end and 2 auxiliary switches does not use switches V, VI, VII and VIII.

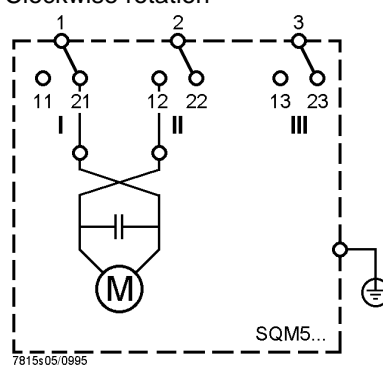
## Direction of rotation

By exchanging the 2 motor connecting cables, the actuator's direction of rotation can be changed from counterclockwise to clockwise, or vice versa.

Counterclockwise rotation



Clockwise rotation



### Note

When changing the direction of rotation from counterclockwise to clockwise, the cams must be readjusted.

Clockwise rotation: Red scales on the cam shaft, double arrow on the cams.

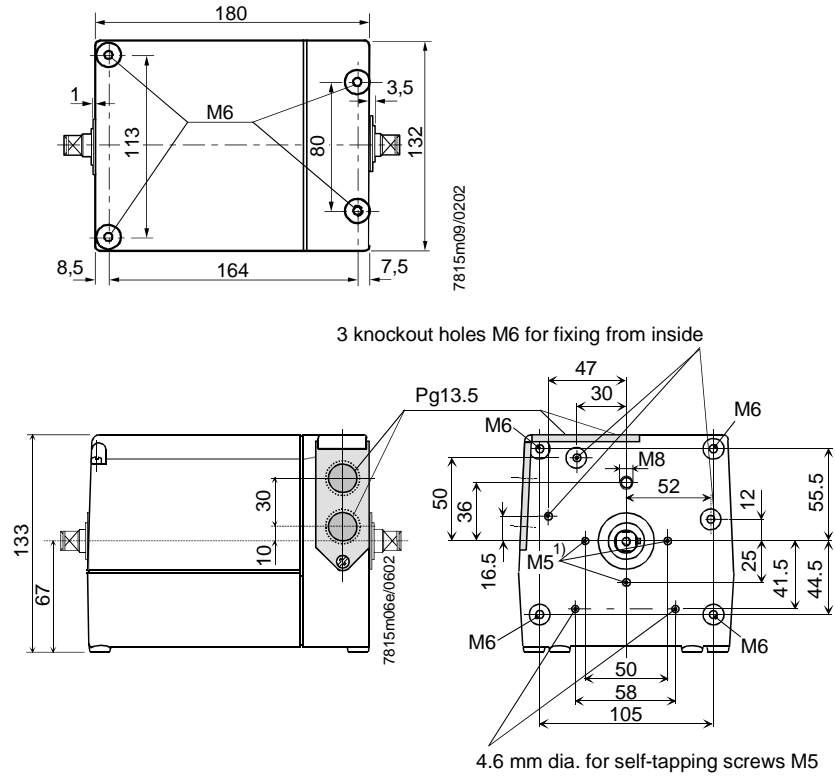
Counterclockwise rotation: Black scales on the cam shaft, single arrow on the cams.



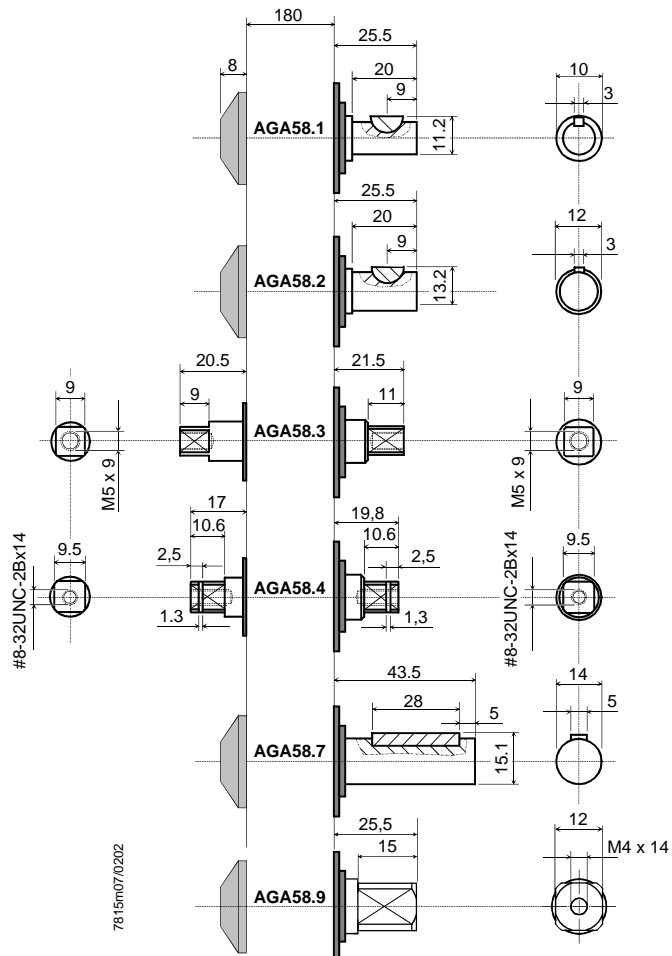
# Dimensions

Dimensions in mm

SQM5...



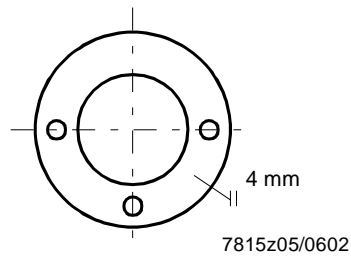
1) Identical with fixing points SQM1... / SQM2...



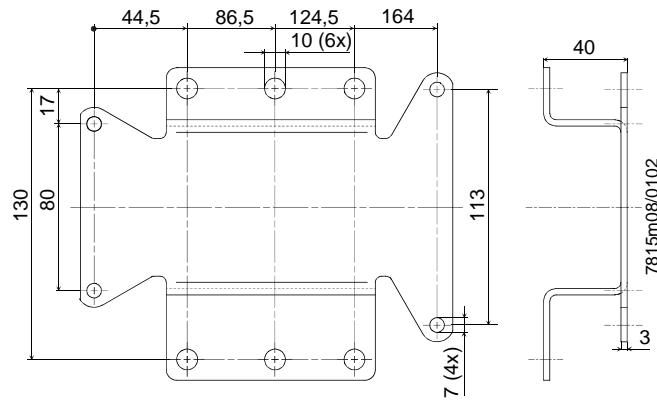
Dimensions (cont'd)

Dimensions in mm

AGA57.1



AGA57.2



AGA57.3

