Product Information
Universal swivel unit SRM 16
SRM
Universal swivel unit

Universal rotary actuator SRM
Universally usable unit for pneumatic swivel and turning movements

Field of application
Can be used in either clean or dirty areas, or wherever pneumatic swiveling is required.

Advantages – Your benefits
Finely graded series with a steady increase in torque for multiple cases of application, the correct size as a standard product is available
Large center bore for feed-through of cables and hoses with the same unit height
Pre-adjusted shock absorber stroke for fast and easy commissioning
Swivel angle can be selected as either 90° or 180° complete flexibility in selecting the angle of rotation, application-specific angles possible on request
Selectable end position adjustability either small or large for flexible adjustability of the swivel angle
Optionally attachable fluid feed-through and electrical feed-through for permanently safe feed-through of gases, vacuum, and electrical sensor and actuator signals
Modular attachment to various options for individual adjustment to various cases of application
Choice of electronic magnetic sensors or inductive proximity sensors for absolute variability of position monitoring

Sizes
Quantity: 7

Weight
0.252 .. 9.74 kg

Torque
0.45 .. 23.7 Nm

Repeat accuracy
0.03 .. 0.07°

Angle of rotation
90 .. 180°
Functional description

When subjected to pressure, the two pneumatic pistons move their end faces in a straight line in their respective bores thus turning the pinion by means of the serrations on their sides.

1. **Housing**
   weight-optimized due to the use of hard-anodized aluminum alloy

2. **Pinion**
   stable pinion for transforming the piston movement into a rotary movement

3. **Swivel angle adjustment**
   for quick, easy and intuitive end position adjustment

4. **Damping**
   Hydraulic shock absorbers for high moments of inertia

5. **Drive**
   Pneumatic, powerful double piston drive

6. **Bearing**
   play-free, pre-loaded bearing
Detailed functional description

Bearing of the pinion

The pinion of the rotary module SRM is driven by two pistons, and is mounted at two points. The upper bearing is integrated in the pinion, whereby a minimum height of the entire unit is achieved. The lower bearing is pre-loaded free from play, whereby a very high accuracy and bearing stiffness is achieved. Both bearings are sealed to the outside with double-lip seals made of sturdy and durable FKM material.

1. Pre-loaded bearing with double lip seal
2. Integrated bearing with double lip seal

Adjustment of end position and shock absorber stroke

The two end positions and the respective shock absorber stroke can be manually adjusted laterally on the unit. Due to the factory presetting of the shock absorber stroke, its adaptation is not necessary for many applications. The markings on the cover show the influence of the direction of rotation on the adjustment of the swivel angle.

1. Adjustment of the shock absorber stroke
2. Adjustment of the end position

Version with external damping

In the basic variant of the SRM, the movement of the drive pistons is damped by the shock absorbers in the piston chamber. In the variant with external damping, the shock absorbers are mounted on the output side of the unit. Here, the movement is directly damped on the rotary table. As a result, higher moments of inertia and a higher repeat accuracy can be realized. In addition, full torque is available in all positions.

1. Hydraulic shock absorber
2. Rotary table with mechanical stop

Variant with media feed-through

The swivel unit SRM can optionally be equipped with a media feed-through, which enables process-reliable feed-through of compressed air, gases, or vacuum. Due to the modular system, the media feed-through is added as a separate module without changing the basic unit. As a result, a separate maintenance is possible. The size of the center hole remains unchanged in this variant.

1. Connection fluid feed-throughs fixed part
2. Connection for the set-up to be swiveled, equipped with fluid feed-throughs
Variant with electric rotary feed-through

The swivel unit SRM can optionally be equipped with an electrical rotary feed-through, thus ensuring operationally reliable feed-through of electrical signals. The electric rotary feed-through is equipped on both sides with standardized and color-coded M8 or M12 cable plugs. This makes it easy to identify the signal flow and simplify commissioning.

1. Plug connector on the driving side, 4-pole, color coded
2. Plug connector on the driven side, 3-pole, color coded
3. Plug connector on the driven side, 4-pole, color coded

Monitoring via electronic magnetic switches

There are two C-slots on each side of the SRM swivel unit, into which the SCHUNK electronic magnetic switches MMS can be inserted. This ensures flexible monitoring of the end positions, regardless of the installation position of the SRM.

1. Monitoring with magnetic switch on the back of the swivel unit
2. Monitoring with magnetic switch on the front of the swivel unit

Monitoring via inductive proximity sensors and adjustable control cam

To monitor the end positions of the swivel unit with inductive sensors, an additional set-up is mounted onto the rotary table. For flexible monitoring of individual swivel angles, a version with adjustable control cam is available. This allows up to three positions to be inductively monitored.

Monitoring via inductive proximity sensors and fixed control cam

For simple commissioning and maintenance of inductive monitoring, a version with a fixed control cam is also available. This is not adjustable and therefore only available for swivel angles of 180° or 90°. As a result, monitoring of up to three positions is possible.
Adjustment range of end positions and swivel angle

Versions with small end position adjustability

Slight end position adjustability for fine adjustment of both end positions (±3°) in case of swivel units with a swivel angle of 180°

1 Adjustment range starting angle  
2 Adjustment range end angle

Slight end position adjustability for fine adjustment of both end positions (±3°) in case of swivel units with a swivel angle of 90°

1 Adjustment range starting angle  
2 Adjustment range end angle

Version with large end position adjustability

Large end position adjustability for variable adjustment of the swivel angle between 0° and 186°. Both end positions can each be limited by 90° (±3°).

1 Adjustment range starting angle  
2 Adjustment range end angle
**Ordering example**

<table>
<thead>
<tr>
<th>Description</th>
<th>SRM</th>
<th>25</th>
<th>H</th>
<th>180</th>
<th>3</th>
<th>4P</th>
<th>6E</th>
<th>SI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>10/12/14/16/25/32/40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of damping method</td>
<td>H = hydraulic</td>
<td>E = Elastomer (for sizes 10-14)</td>
<td>X = external damping (for sizes 10-14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swivel angle</td>
<td>90°/180°</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End position adjustability</td>
<td>3 = ±3°</td>
<td>90 = ±5°/95° (for sizes 10 – 14)</td>
<td>90 = ±3°/93° (for sizes 16 – 40)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of media feed-throughs</td>
<td>- = no</td>
<td>2P = 2 pneumatic feed-throughs (for size 10)</td>
<td>4P = 4 pneumatic feed-throughs (for sizes 12 – 40)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of connectors for electric rotary feed-through</td>
<td>- = no</td>
<td>6E = 6 connectors per side (for sizes 16-32)</td>
<td>10E = 10 connectors per side (for size 40)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option for inductive proximity switches</td>
<td>- = no</td>
<td>SI = with adjustable position</td>
<td>SF = with fixed position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
General notes about the series

**Standard conditions:** The technical data shown refers to an environment of 20 °C and atmospheric pressure.

**Housing material:** Aluminum (extruded profile)

**Actuation:** pneumatic, with filtered compressed air as per ISO 8573-1:2010 [7:4:4].

**Operating principle:** Double piston rack and pinion principle

**Scope of delivery:** Flow control coupling, centering bushings, O-rings for direct connection, assembly and operating manual with declaration of incorporation

**Warranty:** 24 months

**Repeat accuracy:** is defined as a distribution of the end position for 100 consecutive cycles.

**Cleanroom class ISO 14644-1:** 5

**Pinion position:** is always shown in the left end position. The pinion rotates from here to the right in clockwise direction. The arrow makes the direction of rotation clear.

**Pinion screw connection diagram:** When setting a swivel angle smaller than 90°, the left end stop must be completely turned in. This means that the left end position has a screw connection diagram on the pinion which is clockwise turned by 90° compared to the main view, which shows a swivel angle of 180°.

**Customized angle of rotation:** More swivel angles are available on request.

**Torque in the end positions:** Please note that the final angular degrees (approx. 2°) before the end position can only be approached using the force of a single drive piston. For this reason, double actuated modules only have about half the rated torque available in this area.

**Cycle time:** is the rotation time of pinion/flange around the nominal rotation angle. Valve switching times, hose filling times, or PLC reaction times are not included and are to be considered when cycle times are calculated.

Application example

Swivel unit with electrical and pneumatic feed-through and double gripper for loading and unloading a machine tool

1. Universal rotary actuator SRM
2. Tolerance compensation unit TCU
3. Universal gripper PGN–plus–P
4. Inductive proximity switches IN
5. Magnetic switch MMS
6. Universal linear module Beta with toothed belt drive
SCHUNK offers more ...

The following components make the product SRM even more productive – the suitable addition for the highest functionality, flexibility, reliability, and controlled production.

Options and special information

**Shock absorber variants:** The basic version of the swivel unit SRM is equipped with hydraulic shock absorbers. For sizes 10, 12, and 14, additional shock absorber variants are available: elastomer damping (E) and external damping (X).

**End position adjustability:** The SRM is available in the two swivel angles 90° and 180° and the end positions can be fine adjusted. In this case, a fine adjustment of the end positions of ±3° is possible. For all deviating swivel angles, a large end position adjustability is optionally available. Thus, any angle of rotation between −3° and +183° can be realized.

**Variant with media feed-through MDF:** The optional media feed-through ensures process-reliable feeding through of compressed air, gases, or vacuum with four fluid channels.

**Variant with electric rotary feed-through EDF:** The optional electric rotary feed-through ensures process-reliable feed-through of electrical signals.

**Variant with inductive monitoring:** An additional attachment is required to monitor the SRM with inductive proximity switches. Here you can choose between fixed (SF) and adjustable (SI) switching position.

Please note that suitable emergency stop scenarios (e.g., controlled shut down) and restarting scenarios (e.g., pressure build-up valves, appropriate valve switching sequences) are needed for all pneumatic actuators.

† For more information on these products can be found on the following product pages or at schunk.com. Please contact us: SCHUNK technical hotline +49-7133-103-2696
The complete or supplementary technical data of all possible combinations can be found in the catalog below or at schunk.com.
Max. permissible inertia J*

- The diagrams are valid for swivel angles of 90° and 180°, units without center position and for applications with a vertical swivel axis as well as for absolutely centric loads with a horizontal rotary axis and with a pneumatic operating pressure of 6 bar. The swiveling times per throttling have to be observed, otherwise the life time could reduce. We will be happy to help you to design other cases of application.
The drawing shows the unit in standard design, without considering any dimensions of the options described below.

1. The SDV-P pressure maintenance valve can be used to maintain the position in the case of a loss of pressure (see “Accessories” catalog section).

A, a Main / direct connection, rotary actuator rotates clockwise
B, b Main / direct connection, rotary actuator rotates counterclockwise
1 Connection swivel unit
2 Attachment connection
5 0-ring
28 Through-hole
72 Fit for centering sleeves
80 Depth of the centering sleeve hole in the counter part
52 Sensor MMS 22..
The drawing shows an example of the SRM with the maximum possible number of optional modules. The SRM can be ordered as a basic version without optional modules, with each option individually, or as a combination of several optional modules. The unit is supplied fully assembled. The options cannot be ordered separately. You can find a list of the available combinations including IDs in the technical data table.

The drawing shows the maximum additional dimension. Depending on the selected optional modules, the total height is reduced accordingly.
Main view option of media feed-through MDF

The drawing shows the option of media feed-through, without the base module or other options for the swivel unit.

<table>
<thead>
<tr>
<th>Torque of the swivel unit at 6 bar in the fluid feed-through (Nm)</th>
<th>Weight of the module without base unit (kg)</th>
<th>No. of fluid feed-throughs</th>
<th>Min. pressure in the fluid feed-through (bar)</th>
<th>Nominal pressure of fluid feed-through (bar)</th>
<th>Max. pressure in fluid feed-through (bar)</th>
<th>Max. volumetric flow of feed-through (at 6 bar) (l/min)</th>
<th>Diameter of center bore (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option for media feed-through MDF</td>
<td>0.7</td>
<td>4</td>
<td>-0.8</td>
<td>6</td>
<td>8</td>
<td>140</td>
<td>10.5</td>
</tr>
</tbody>
</table>

The above-mentioned data refer only to the option and not to the complete unit.
Main view option of electric rotary feed-through EDF

The drawing shows the option of an electric rotary feed-through without the base module or other options for the swivel unit.

A, a Main / direct connection, rotary actuator rotates clockwise
B, b Main / direct connection, rotary actuator rotates counterclockwise

2 Attachment connection
5 Fluid feed-through
72 Fit for centering sleeves
80 Depth of the centering sleeve hole in the counter part
83 Input for 3 pole sensor feed-through
84 Input for 4 pole sensor feed-through
90 Additional dimension of the attached module, option EDF output side
93 Additional dimension of the attached module, option EDF drive side
94 EDF drive side hidden from view
95 EDF output side hidden from view
96 SRM basis and other options

<table>
<thead>
<tr>
<th>Weight of the module without base unit</th>
<th>Size of the socket (output)</th>
<th>Size of the connector (drive)</th>
<th>Number of wires</th>
<th>Max. voltage</th>
<th>Max. current per wire</th>
<th>Max. ambient temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>[kg]</td>
<td>[V]</td>
<td>[A]</td>
<td>[°C]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optional electric rotary feed-through EDF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.34</td>
<td>4xM8/3 pole</td>
<td>4xM8/3 pole</td>
<td>20</td>
<td>48</td>
<td>1</td>
<td>60</td>
</tr>
</tbody>
</table>

This option cannot be ordered separately. It is a part of a configured version of the swivel unit. For achieving the complete technical data of all possible combination possibilities, please configure the swivel unit at schunk.com. Please note that the above-mentioned data refer only to the option and not to the complete unit.
Main view option for inductive proximity switches

The drawing shows the option of using inductive proximity switches without the base module or other options for the swivel unit. With this option, up to three positions can be monitored with inductive sensors. Option SI offers adjustable monitoring positions; SF offers fixed positions.

<table>
<thead>
<tr>
<th>Description</th>
<th>Position monitoring is adjustable</th>
<th>Weight of the module without base unit [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option for inductive proximity switches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SF 16</td>
<td>no</td>
<td>0.19</td>
</tr>
<tr>
<td>SI 16</td>
<td>yes</td>
<td>0.12</td>
</tr>
</tbody>
</table>

This option cannot be ordered separately. It is part of a configured version of the swivel unit. For achieving the complete technical data of all possible combination possibilities, please configure the swivel unit at schunk.com. Please note that the above-mentioned data refer only to the option and not to the complete unit.
Hose-free direct connection M3

The direct connection is used for compressed air supply without error-prone tubing. Instead, the pressure medium is fed through the bore-holes in the mounting plate. The required O-ring as well as the fixed throttle are enclosed to the product's accessory kit.

Large end position adjustability 90°

Dimensional changes for the option with "large end position adjustability (90°)". This permits the end positions to be adjusted by up to 93°. More information can be found in the introduction to the series.

Adapter for SCHUNK gripper

Adapter plates are available for mounting many types of SCHUNK grippers. All combinations of swivel/gripping units, and associated adapter plates can be configured in the SCHUNK PARTcommunity and downloaded as a 3D model.
**SRM 16**

**Universal swivel unit**

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**IN 80 inductive proximity switches**

![Image of IN 80 inductive proximity switches]

End and intermediate position monitoring can be mounted with mounting kit.

<table>
<thead>
<tr>
<th>Description</th>
<th>ID</th>
<th>Position monitoring is adjustable</th>
<th>Weight of the module without base unit (kg)</th>
<th>Often combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option for inductive proximity switches</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI 16</td>
<td>0.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI 16</td>
<td>0.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inductive proximity switches</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN 80–D–M12</td>
<td>0301588</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN 80–D–M8</td>
<td>0301488</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN 80–S–M12</td>
<td>0301578</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN 80–S–M8</td>
<td>0301478</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INK 80–D</td>
<td>0301551</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INK 80–S</td>
<td>0301550</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inductive proximity switch with lateral cable outlet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN 80–S–M12–SA</td>
<td>0301587</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN 80–S–M8–SA</td>
<td>0301483</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INK 80–S–SA</td>
<td>0301566</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Per unit two sensors (closer/S) are required for each unit, as well as extension cables on option. Please consider the minimum permissible bending radii for sensor cables. These are generally 35 mm.

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**Electronic magnetic switch MMS**

![Image of Electronic magnetic switch MMS]

End position monitoring for mounting in the C-slot.

<table>
<thead>
<tr>
<th>Description</th>
<th>ID</th>
<th>Often combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic magnetic switch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMS 22–S–MB–PNP</td>
<td>0301032</td>
<td></td>
</tr>
<tr>
<td>MMSK 22–S–PNP</td>
<td>0301034</td>
<td></td>
</tr>
<tr>
<td>Electronic magnetic switches with lateral cable outlet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMS 22–S–MB–PNP–SA</td>
<td>0301062</td>
<td></td>
</tr>
<tr>
<td>MMSK 22–S–PNP–SA</td>
<td>0301064</td>
<td></td>
</tr>
<tr>
<td>Cable extension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KV BW08–SG08 3P–0030–PNP</td>
<td>0301495</td>
<td></td>
</tr>
<tr>
<td>KV BW08–SG08 3P–0100–PNP</td>
<td>0301496</td>
<td></td>
</tr>
<tr>
<td>KV BW08–SG08 3P–0200–PNP</td>
<td>0301497</td>
<td></td>
</tr>
<tr>
<td>Clip for plug/socket</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLI–MB</td>
<td>0301463</td>
<td></td>
</tr>
<tr>
<td>Connection cables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KA BG08–L 3P–0300–PNP</td>
<td>0301622</td>
<td></td>
</tr>
<tr>
<td>KA BG08–L 3P–0500–PNP</td>
<td>0301623</td>
<td></td>
</tr>
<tr>
<td>KA BW08–L 3P–0300–PNP</td>
<td>0301594</td>
<td></td>
</tr>
<tr>
<td>KA BW08–L 3P–0500–PNP</td>
<td>0301592</td>
<td></td>
</tr>
<tr>
<td>Sensor distributor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V2–MB</td>
<td>0301775</td>
<td></td>
</tr>
<tr>
<td>V4–MB</td>
<td>0301766</td>
<td></td>
</tr>
<tr>
<td>V8–MB</td>
<td>0301751</td>
<td></td>
</tr>
</tbody>
</table>

1. Two sensors are required per unit for monitoring two positions. On option, extension cables and sensor distributors are available.

Additional product variants of the sensor, and further information and technical data can be found in the catalog chapter sensor system.
Programmable magnetic switch MMS 22–PI1

Position monitoring with one programmable position per sensor and integrated electronic system in the sensor. Can be programmed using MT magnetic teaching tool (included in the scope of delivery) or ST plug teaching tool (optional). End position monitoring for mounting in the C-slot. If the ST plug teaching tools are listed in the table provided, teaching is only possible with the ST teaching tools.

<table>
<thead>
<tr>
<th>Description</th>
<th>ID</th>
<th>Often combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmable magnetic switch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMS 22–PI1–S–MB–PNP</td>
<td>0301160</td>
<td></td>
</tr>
<tr>
<td>MMSX 22–PI1–S–PNP</td>
<td>0301162</td>
<td></td>
</tr>
<tr>
<td>Programmable magnetic switch with lateral cable outlet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMS 22–PI1–S–MB–PNP–SA</td>
<td>0301166</td>
<td></td>
</tr>
<tr>
<td>MMSX 22–PI1–S–PNP–SA</td>
<td>0301168</td>
<td></td>
</tr>
<tr>
<td>Programmable magnetic switch with stainless steel housing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMS 22–PI1–S–MB–PNP–HD</td>
<td>0301110</td>
<td></td>
</tr>
<tr>
<td>MMSX 22–PI1–S–PNP–HD</td>
<td>0301112</td>
<td></td>
</tr>
</tbody>
</table>

Two sensors are required per unit for monitoring two positions. On option, extension cables and sensor distributors are available. Additional product variants of the sensor, and further information and technical data can be found in the catalog chapter sensor system.
Jens Lehmann, German goalkeeper legend, SCHUNK brand ambassador since 2012 for safe, precise gripping and holding.
schunk.com/Lehmann