

Assembly and Operating Manual

RMPG

Gripper swivel module



Superior Clamping and Gripping

SCHUNK 

Imprint

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Dear Customer,

thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

Customer Management

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Please read the operating manual in full and keep it close to the product.

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1 General

1.1 About this manual

This manual contains important information for a safe and appropriate use of the product.

This manual is an integral part of the product and must be kept accessible for the personnel at all times.

Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.

Illustrations in this manual are provided for basic understanding and may differ from the actual product design.

In addition to these instructions, the documents listed under ▶ 1.1.3 [6] are applicable.

1.1.1 Presentation of Warning Labels

To make risks clear, the following signal words and symbols are used for safety notes.



⚠ DANGER

Danger for persons!

Non-observance will inevitably cause irreversible injury or death.



⚠ WARNING

Dangers for persons!

Non-observance can lead to irreversible injury and even death.



⚠ CAUTION

Dangers for persons!

Non-observance can cause minor injuries.

CAUTION

Material damage!

Information about avoiding material damage.

1.1.2 Symbol definition

The following symbols are used in this manual:

- Prerequisite for an action
 1. Action 1
 2. Action 2
 - ✓ Intermediate results
 - ✓ Final results
- ▶ 1.1.2 [📄 6]: chapter number and [page number] in hyperlinks

1.1.3 Applicable documents

- General terms of business *
- Catalog data sheet of the product *
- Assembly and operating manuals of the accessories *
- Assembly and operating manual for RM rotary module
- "Toolbox rotation" program for rotary module
- "Kombibox" program

The documents marked with an asterisk (*) can be downloaded on our homepage **schunk.com**

1.1.4 Variants

This operating manual applies to the following variations:

- RMPG without gripping force maintenance
- RMPG with gripping force maintenance "O.D. gripping" (AS)
- RMPG with gripping force maintenance "I.D. gripping" (IS)

1.2 Warranty

If the product is used as intended, the warranty is valid for 24 months from the ex-works delivery date under the following conditions:

- Observe the specified maintenance and lubrication intervals
- Observe the ambient conditions and operating conditions

Parts touching the workpiece and wear parts are not included in the warranty.

1.3 Scope of delivery

The scope of delivery includes

- Gripper swivel module RMPG in the version ordered
- Exhaust air throttles
- Accessory pack

1.4 Accessories

The following accessories, which must be ordered separately, are required for the product:

- Sensors

For information regarding which accessory articles can be used with the corresponding product variants, see catalog data sheet.

1.4.1 Sensors

Overview of the compatible sensors

Designation	Type
Inductive proximity switches *	IN
Magnetic switch **	MMS

* Monitoring: Rotary movement

* Monitoring: Gripping movement

- Exact type designation of the compatible sensors see catalog.
- Information on handling sensors is available at schunk.com or from SCHUNK contact persons.

2 Basic safety notes

2.1 Intended use

The product is designed exclusively for gripping and temporarily holding workpieces or objects.

- The product may only be used within the scope of its technical data, ▶ 3 [□ 16].
- When implementing and operating components in safety-related parts of the control systems, the basic safety principles in accordance with DIN EN ISO 13849-2 apply. The proven safety principles in accordance with DIN EN ISO 13849-2 also apply to categories 1, 2, 3 and 4.
- The product is intended for installation in a machine/system. The applicable guidelines must be observed and complied with.
- The product is intended for industrial and industry-oriented use.
- Appropriate use of the product includes compliance with all instructions in this manual.

2.2 Not intended use

It is not intended use if the product is used, for example, as a pressing tool, stamping tool, lifting gear, guide for tools, cutting tool, clamping device or a drilling tool.

- Any utilization that exceeds or differs from the appropriate use is regarded as misuse.

2.3 Constructional changes

Implementation of structural changes

By conversions, changes, and reworking, e.g. additional threads, holes, or safety devices can impair the functioning or safety of the product or damage it.

- Structural changes should only be made with the written approval of SCHUNK.

2.4 Spare parts

Use of unauthorized spare parts

Using unauthorized spare parts can endanger personnel and damage the product or cause it to malfunction.

- Use only original spare parts or spares authorized by SCHUNK.

2.5 Gripper fingers

Requirements of gripper fingers

Accumulated energy can make the product unsafe and risk the danger of serious injuries and considerable material damage.

- Execute the gripper fingers in such a way that the product reaches either the "open" or "closed" position in a de-energized state.
- Only change gripper fingers if no residual energy can be released.
- Make sure that the product and the top jaws are a sufficient size for the application.

2.6 Environmental and operating conditions

Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction to the product's life span. See also Link Daten Umgebungs- und Einsatzbedingungen.

- Make sure that the product is not exposed to excessive vibrations and/or strokes.
- Ensure that no strong magnetic fields impair the function of the product.
Contact your SCHUNK partner if the product is to be used in strong magnetic fields.
- Make sure that the module and the top jaws are a sufficient size for the application.

2.7 Personnel qualification

Inadequate qualifications of the personnel

If the personnel working with the product is not sufficiently qualified, the result may be serious injuries and significant property damage.

- All work may only be performed by qualified personnel.
- Before working with the product, the personnel must have read and understood the complete assembly and operating manual.
- Observe the national safety regulations and rules and general safety instructions.

The following personal qualifications are necessary for the various activities related to the product:

Trained electrician

Due to their technical training, knowledge and experience, trained electricians are able to work on electrical systems, recognize and avoid possible dangers and know the relevant standards and regulations.

Qualified personnel

Due to its technical training, knowledge and experience, qualified personnel is able to perform the delegated tasks, recognize and avoid possible dangers and knows the relevant standards and regulations.

Instructed person

Instructed persons were instructed by the operator about the delegated tasks and possible dangers due to improper behaviour.

Service personnel of the manufacturer

Due to its technical training, knowledge and experience, service personnel of the manufacturer is able to perform the delegated tasks and to recognize and avoid possible dangers.

2.8 Personal protective equipment

Use of personal protective equipment

Personal protective equipment serves to protect staff against danger which may interfere with their health or safety at work.

- When working on and with the product, observe the occupational health and safety regulations and wear the required personal protective equipment.
- Observe the valid safety and accident prevention regulations.
- Wear protective gloves to guard against sharp edges and corners or rough surfaces.
- Wear heat-resistant protective gloves when handling hot surfaces.
- Wear protective gloves and safety goggles when handling hazardous substances.
- Wear close-fitting protective clothing and also wear long hair in a hairnet when dealing with moving components.

2.9 Notes on safe operation

Incorrect handling of the personnel

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Avoid any manner of working that may interfere with the function and operational safety of the product.
- Use the product as intended.
- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. This does not apply to products that are designed for special environments.
- Eliminate any malfunction immediately.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention and environmental protection regulations regarding the product's application field.

2.10 Transport

Handling during transport

Incorrect handling during transport may impair the product's safety and cause serious injuries and considerable material damage.

- When handling heavy weights, use lifting equipment to lift the product and transport it by appropriate means.
- Secure the product against falling during transportation and handling.
- Stand clear of suspended loads.

2.11 Malfunctions

Behavior in case of malfunctions

- Immediately remove the product from operation and report the malfunction to the responsible departments/persons.
- Order appropriately trained personnel to rectify the malfunction.
- Do not recommission the product until the malfunction has been rectified.
- Test the product after a malfunction to establish whether it still functions properly and no increased risks have arisen.

2.12 Disposal

Handling of disposal

The incorrect handling of disposal may impair the product's safety and cause serious injuries as well as considerable material and environmental harm.

- Follow local regulations on dispatching product components for recycling or proper disposal.

2.13 Fundamental dangers

General

- Observe safety distances.
- Never deactivate safety devices.
- Before commissioning the product, take appropriate protective measures to secure the danger zone.
- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- If the energy supply is connected, do not move any parts by hand.
- Do not reach into the open mechanism or movement area of the product during operation.

2.13.1 Protection during handling and assembly

Incorrect handling and assembly

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Have all work carried out by appropriately qualified personnel.
- For all work, secure the product against accidental operation.
- Observe the relevant accident prevention rules.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

Incorrect lifting of loads

Falling loads may cause serious injuries and even death.

- Stand clear of suspended loads and do not step into their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.

2.13.2 Protection during commissioning and operation

Falling or violently ejected components

Falling and violently ejected components can cause serious injuries and even death.

- Take appropriate protective measures to secure the danger zone.
- Never step into the danger zone during operation.

2.13.3 Protection against dangerous movements

Unexpected movements

Residual energy in the system may cause serious injuries while working with the product.

- Switch off the energy supply, ensure that no residual energy remains and secure against inadvertent reactivation.
- Never rely solely on the response of the monitoring function to avert danger. Until the installed monitors become effective, it must be assumed that the drive movement is faulty, with its action being dependent on the control unit and the current operating condition of the drive. Perform maintenance work, modifications, and attachments outside the danger zone defined by the movement range.
- To avoid accidents and/or material damage, human access to the movement range of the machine must be restricted. Limit/prevent accidental access for people in this area due through technical safety measures. The protective cover and protective fence must be rigid enough to withstand the maximum possible movement energy. EMERGENCY STOP switches must be easily and quickly accessible. Before starting up the machine or automated system, check that the EMERGENCY STOP system is working. Prevent operation of the machine if this protective equipment does not function correctly.

2.13.4 Protection against electric shock

Possible electrostatic energy

Components or assembly groups may become electrostatically charged. When the electrostatic charge is touched, the discharge may trigger a shock reaction leading to injuries.

- The operator must ensure that all components and assembly groups are included in the local potential equalisation in accordance with the applicable regulations.
- While paying attention to the actual conditions of the working environment, the potential equalisation must be implemented by a specialist electrician according to the applicable regulations.
- The effectiveness of the potential equalisation must be verified by executing regular safety measurements.

2.14 Notes on particular risks



⚠ WARNING

Risk of injury from crushing and impacts!

Serious injury could occur during the base jaw procedure and when breaking or loosening the gripper fingers.

- Wear suitable protective equipment.
- Do not reach into the open mechanism or the movement area of the product.



⚠ WARNING

Risk of injury from objects falling and being ejected!

Falling and ejected objects during operation can lead to serious injury or death.

- Take appropriate protective measures to secure the danger zone.



⚠ WARNING

Risk of injury from rotating components!

In the case of swivel units or rotary tables with a rotary drive, serious injuries can be caused by rotating components.

- Take appropriate protective measures to secure the danger zone.

**⚠ WARNING****Risk of injury due to workpieces loosening if the end position damping is damaged**

Observe the notes on setting the end position damping in the operating manual of the RM rotary module.

**⚠ WARNING****Risk of injury due to unexpected movements!**

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.

2.14.1 Variant gripping force maintenance

**⚠ WARNING****Risk of injury from objects falling during energy supply failure**

Products with a mechanical gripping force maintenance can, during energy supply failure, still move independently in the direction specified by the mechanical gripping force maintenance.

- Secure the end positions of the product with SCHUNK SDV-P pressure maintenance valves.

**⚠ WARNING****Risk of injury due to uncontrolled movements!**

While disassembling uncontrolled movements of the gripper's individual parts of grippers with gripping force maintenance may cause serious injuries.

- Switch off the energy supply.
- Ensure there is no residual energy in the system.
- Disassemble the gripper carefully.

3 Technical data

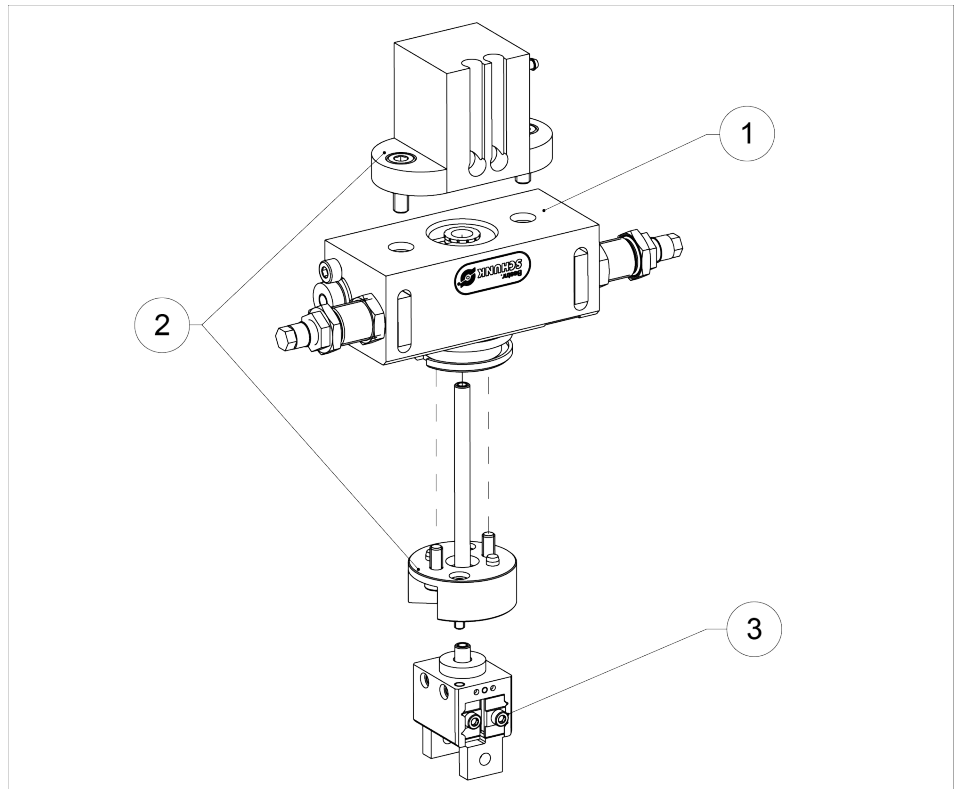
Size	0612	0812	0816	1016	1020
Mechanical operating data					
Angle of rotation [°]	0 - 185				
Recommended workpiece weight [kg]	0.05	0.05	0.13	0.13	0.14
IP rating	40				
Ambient temperature [°C] min. max.	+ 5 + 60				
Noise emission [dB(A)]	≤ 70				
Operating data for compressed air connection					
Pressure medium	Compressed air, compressed air quality according to ISO 8573-1:7 4 4				
Standard gripping Min. pressure [bar] Max. pressure [bar]	2 8				
Gripping option IS Min. pressure [bar] Max. pressure [bar]	4 -		4 6.5		
Gripping option AS Min. pressure [bar] Max. pressure [bar]	- -		4 6.5		
Turning Min. pressure [bar] Max. pressure [bar]	3 8				
Nominal working pressure [bar]	6				
Gripping fluid consumption Double stroke standard [cm ³]	0.5	0.5	0.93	0.93	1.56
Gripping fluid consumption Double stroke standard IS / AS [cm ³]	-	-	1.18	1.18	2.02
Turning cycle fluid consumption (2x185°) [cm ³]	0.66	1.4	1.4	2.9	2.9

** at nominal operating pressure

More technical data is included in the catalog data sheet.
Whichever is the latest version.

4 Description of module

4.1 Module design



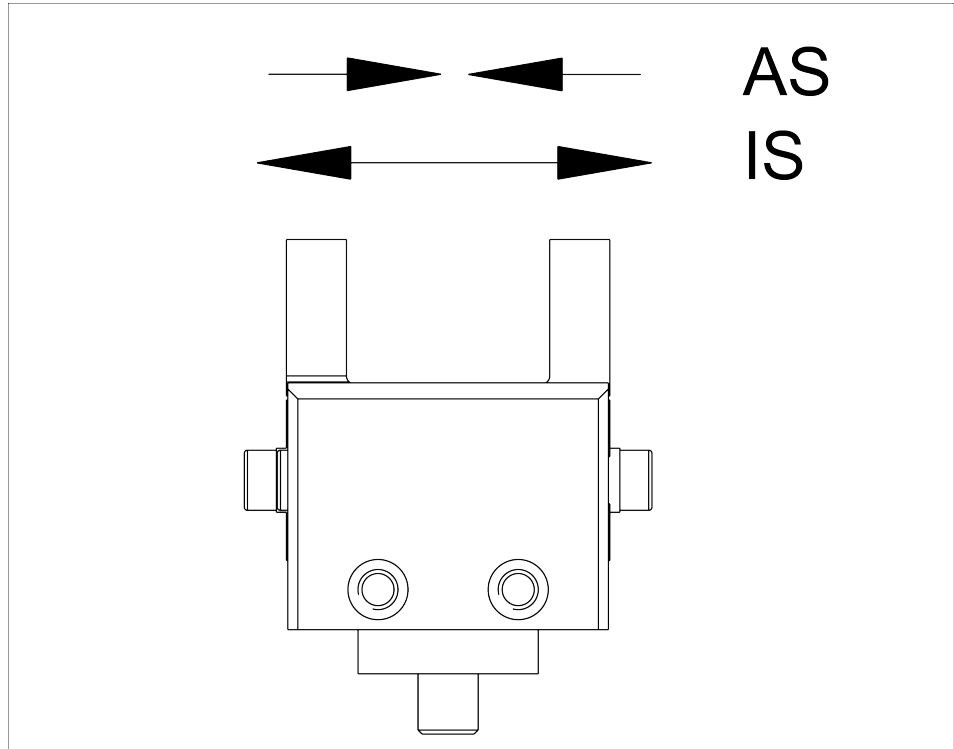
Module design

RMPG modules consist of a complete RM rotary module (1) and a gripping module consisting of a drive unit (2) and gripper head (3).

4.2 RMPG variants... IS / AS

The gripper swivel module is optionally available **from size 0816** with maintenance of gripping force in the variants:

- with gripping force maintenance O.D. gripping
- with gripping force maintenance I.D. gripping



Effective direction of maintenance of gripping force

5 Assembly

5.1 Mechanical connection

Evenness of the mounting surface

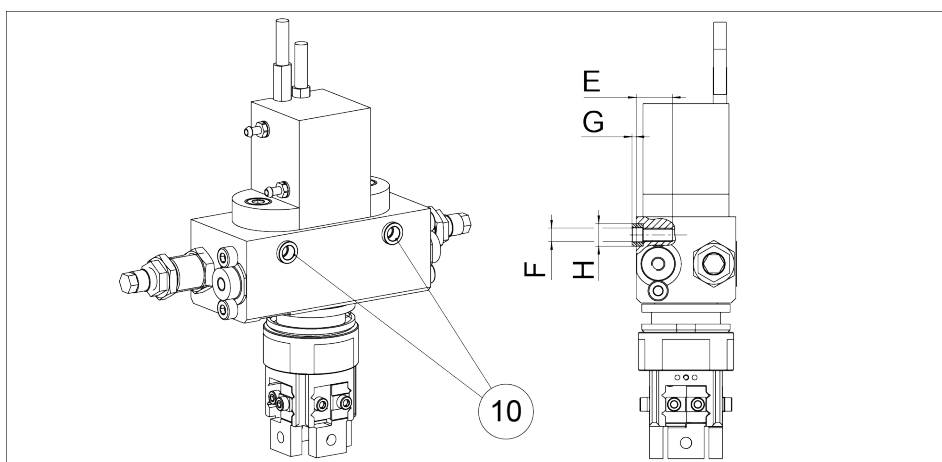
The values apply to the whole mounting surface to which the product is mounted.

Requirements for evenness of the mounting surface (Dimensions in mm)

Edge length	Permissible unevenness
< 100	< 0.02
> 100	< 0.05

Mounting

The connection geometry is located on the side of the rotary module. See catalog for dimensions to position the mounting holes.



Mechanical connection

Mounting material / Connection dimensions for RMPG...

Item	Mounting	RMPG				
		0612	0812	0816	1016	1020
F	Thread for fastening screw	M3	M3	M3	M3	M3
E	Max. depth of engagement from locating surface [mm]	6	8	8	9	9
G	Projection of centering sleeve [mm]	1	1	1	1	1
H	Bore hole for centering sleeve [mm]	Ø 5H7	Ø 5H7	Ø 5H7	Ø 5H7	Ø 5H7
10 *	Centering sleeve (2x)	Ø5 x 2.5	Ø5 x 2.5	Ø5 x 2.5	Ø5 x 2.5	Ø5 x 2.5

* included in the scope of delivery of the module.

CAUTION

Material damage due to improper assembly!

- When mounting loads, do not allow impermissible forces and moments to be exerted (see catalog data sheet).
- Select a suitable tightening torque when assembling the product or loads on the product in accordance with the generally accepted guidelines for screw connections.
- Secure all screws using a suitable chemical screw lock.

5.2 Pneumatic connection



⚠ WARNING

Risk of injury due to loss of workpiece if the gripper jaws move too quickly or if the workpiece is gripped too hard!

- Switch off the energy supply. Ensure that no residual energy remains in the system.



⚠ WARNING

Risk of injury due to unexpected movements of the machine/ automated system!

- Use of exhaust air throttle valves to control the movement of the gripper jaws.
- When commissioning, first set a slow motion, then adjust to the desired speed in a controlled manner.

CAUTION

Damage to the gripper is possible!

If the maximum permissible finger weight or the permissible mass moment of inertia of the fingers is exceeded, the gripper can be damaged.

- A jaw movement always has to be without jerks and bounce.
- You must therefore implement sufficient reduction and/or damping.
- Observe the diagrams and information in the catalog data sheet.

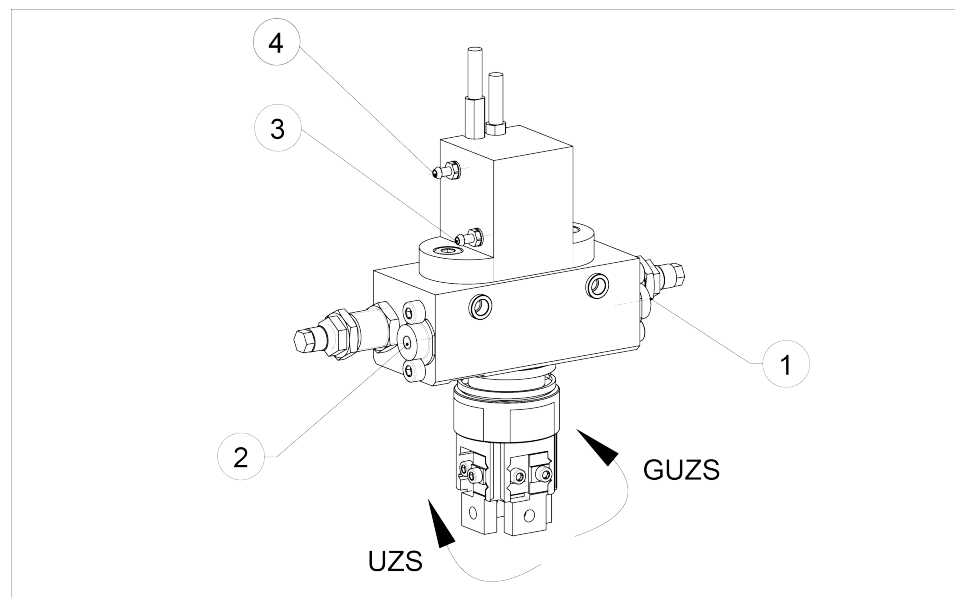
CAUTION**Damage to the rotary module possible!**

The rotary module can be damaged if it arrives too abruptly in the end position.

- The rotary motion must reach the end position without jerk or bounce.
- Therefore flow control valves and shock absorbers must be used, ▶ 5.4 [□ 25] and ▶ 5.5 [□ 26].
- Please observe the information in the catalog pages.

NOTE

- Observe the requirements for the compressed air supply, ▶ 3 [□ 16].
- In case of compressed air loss (cutting off the energy line), the components lose their dynamic effects and do not remain in a secure position. However, the use of a SDV-P pressure maintenance valve is recommended in this case in order to maintain the dynamic effect for some time. Product variants are also offered with mechanical gripping force via springs, which also ensure a minimum clamping force in the event of a pressure drop.



Pneumatic control / air connections

Pneumatic control / air connections

Item	Designation	Description	0612	0812	0816	1016	1020	
1	A *	Swivel unit Clockwise rotation	M3					
2	B *	Swivel unit Counter-clockwise rotation	M3					
3	C *	Open gripper	-	-	-	M3	M3	
	C **		Grommet for hose Di=1.6mm			-	-	
4	D *	Close gripper	-	-	-	M3	M3	
	D **		Grommet for hose Di=1.6mm			-	-	

* provided by the customer

** Included in the scope of delivery

5.3 Mounting the sensor

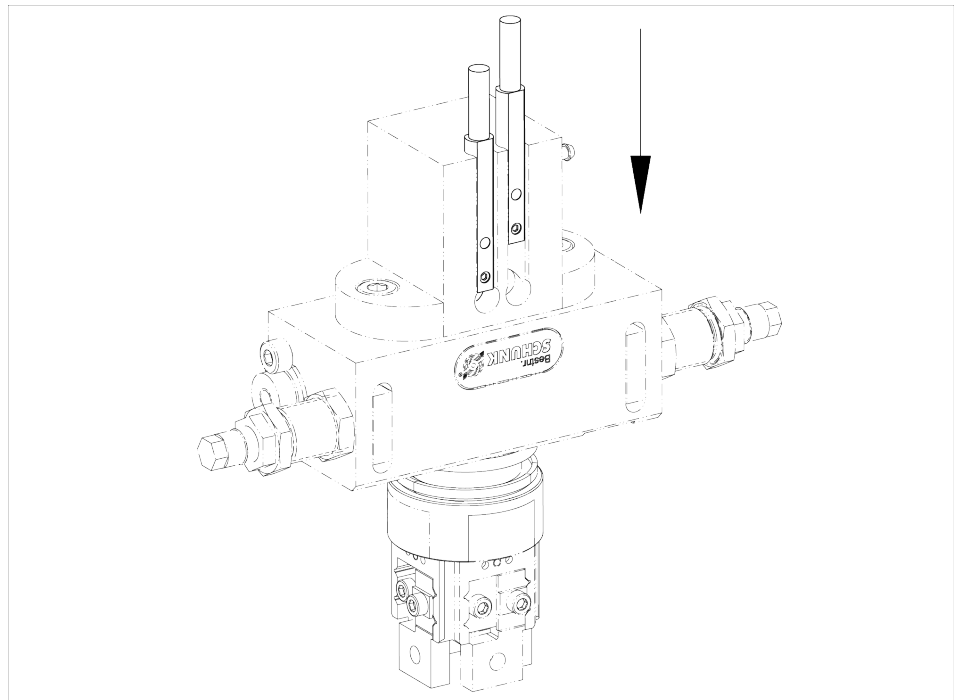
NOTE

Observe the assembly and operating manual of the sensor for mounting and connecting.

The product is equipped for the use of sensors.

- For the exact type designations of suitable sensors, please see the catalog data sheet.
- For technical data for the suitable sensors, see Assembly and Operating Manual and catalog data sheet.
 - The Assembly and Operating Manual and catalog data sheet are included in the scope of delivery for the sensors and are available at schunk.com.
- Information on handling sensors is available at schunk.com or from SCHUNK contact persons.

5.3.1 Attachment of sensors to gripping module drive unit



Attachment of magnetic switch MMS to drive unit

CAUTION

Material damage due to an incorrect tightening torque!

If the threaded pin is tightened with an incorrect tightening torque, the product may be damaged.

- Observe a maximum tightening torque of 10 Ncm for the set-screws.

5.3.2 Attachment of sensors to rotary unit

5.3.2.1 RM06

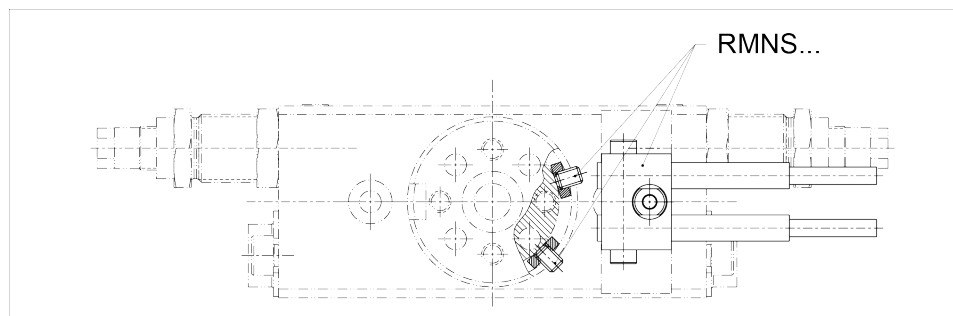
The NI 03 sensor for the end positions – monitoring has to be ordered as an accessory.

- The drive piston is present at the respective stop coupling (10).
 1. Release cone nut (12).
 2. Push the sensor in the direction of the piston until a signal is present.
 3. Tighten the sensor again with the counter nut.

5.3.2.2 RM08/10

To monitor the end positions, standardized monitoring sets for direct installation are available.

The clamped control cam is monitored in the rotary table.



RMNS 08

Proximity switch - RMNS-08 monitoring set for

- RM 08 rotary module
- RM 10 rotary module

The monitoring set's scope of delivery includes the following:

- 1x retaining plate
- 2x control cam
- 2x proximity switch
- 2x connection cable

Setting the monitoring

- Piston is in the respective end position.
- The proximity switch is set to the switching condition.
 1. Undo the attachment screw.
 2. Push the control cam in the prism slot of the rotary table until the signal is present.
 3. Fix the control cam via the attachment screw.

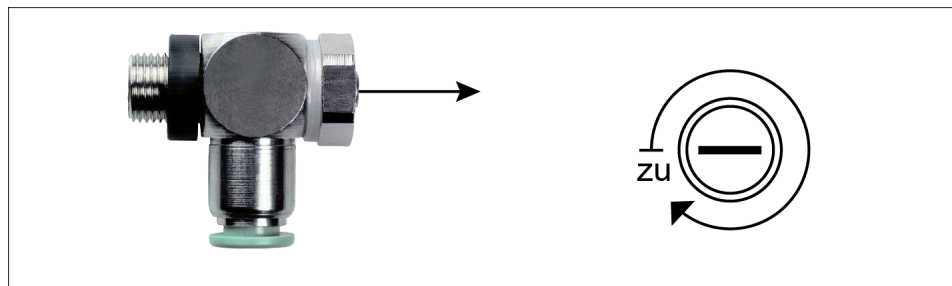
5.4 Setting the speed

CAUTION

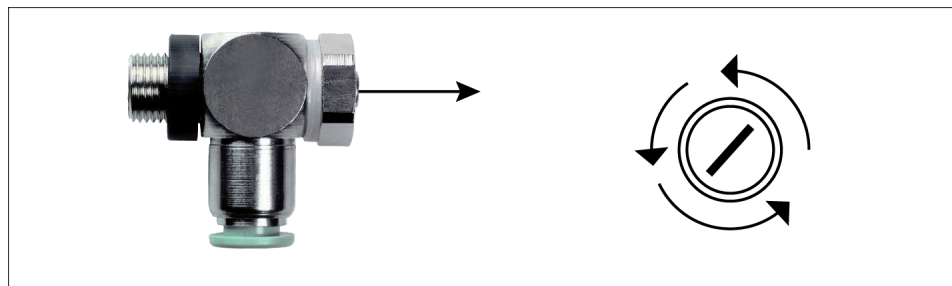
Material damage due to erroneous settings!

If the end position is approached too hard, the product may be damaged.

- Adjust exhaust throttle valve and shock absorber so that the movement is braked smoothly.



1. Close exhaust throttle valve completely.



2. Open exhaust throttle valve until the product starts to move.
3. Continue to open the exhaust throttle valve incrementally until the movement decelerates smoothly.
 - ✓ If the speed is too low, the product will brake too soon and the end position will be reached too slowly.
 - ✓ If the speed is too high, the product will impact against the end position and the shock absorber will be overloaded.

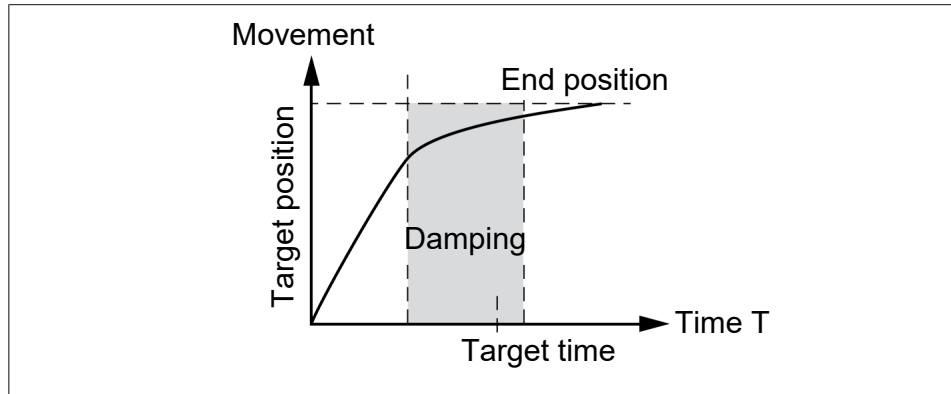
NOTE

A smooth motion may also be too slow in many use-cases. Further settings can be made via the shock absorbers, ▶ 5.5 [□ 26].

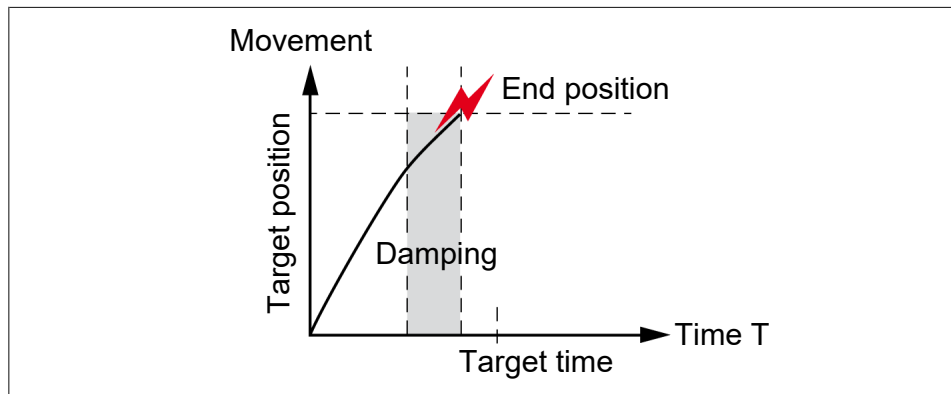
5.5 Adjustment of the shock absorber stroke

NOTE

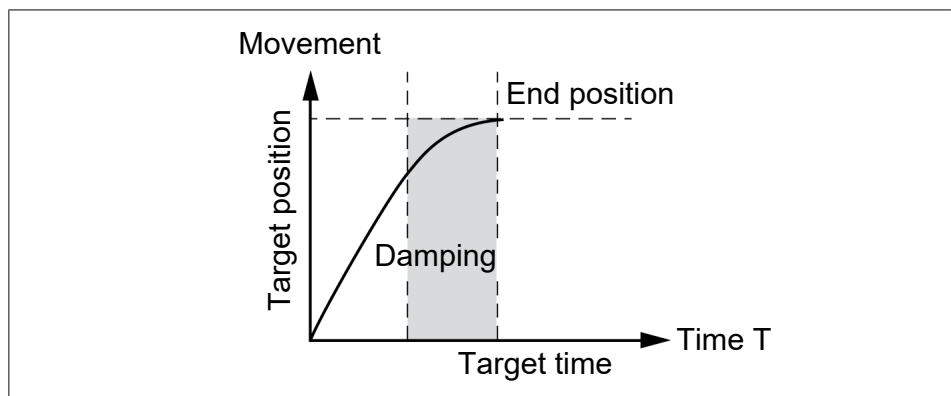
When received from the factory, the unit is set to utilize the maximum shock absorber stroke.



The shock absorber stroke is too long and the end position is reached too slowly.



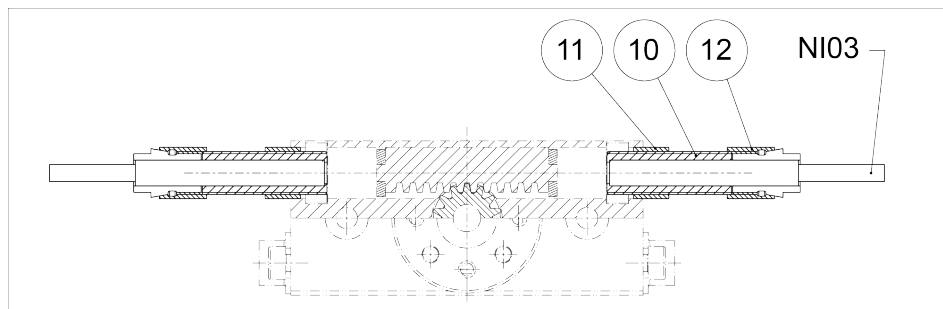
The shock absorber stroke is too short and the unit arrives in the end position too abruptly.



Optimal shock absorber stroke.

5.6 Settings for the rotary movement

5.6.1 RM06



Adjusting the limit positions RM06

The following parts are included in the scope of delivery for angle of rotation fine adjustment.

- Stop coupling (10)
- Counter nut (11)
- Cone nut (12)

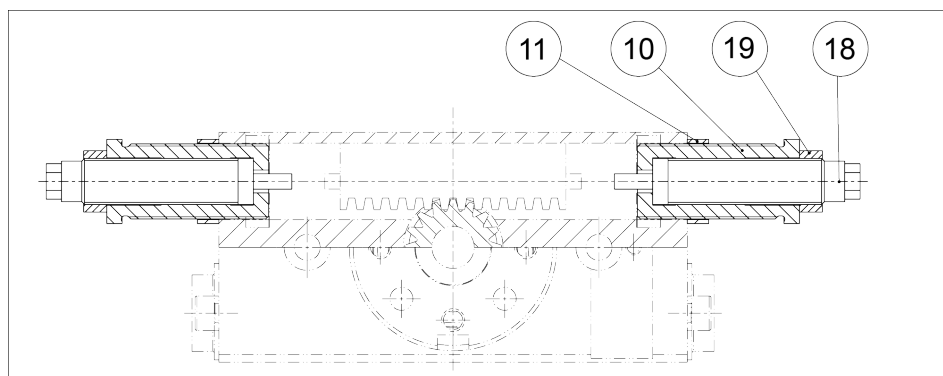
**Angle of rotation
fine adjustment**

1. Release counter nut (11).
2. Now each end position can be adjusted to any angle between -2.5° and $+90^\circ$ by twisting the stop coupling (10).
3. Tighten the stop coupling again with the counter nut.

**End position
dampening**

An elastomer is integrated in the drive piston for end position dampening.

5.6.2 RM08/10



Adjustment of RM08/10 end positions

The following parts are included within the scope of delivery for angle of rotation fine adjustment and adjustment of the end position dampening to the mass moment of inertia occurring in operation.

- Stop coupling (10)
- Counter nut (11)
- Counter nut (19)
- Shock absorber (18)

**Angle of rotation
fine adjustment**

1. Release counter nut (11).
2. Each end position can be adjusted to any angle between -2.5° and $+90^\circ$ by twisting the stop coupling (10) with the shock absorber (18) integrated in it.
3. Tighten the stop coupling again with the counter nut.

**Dampening
adjustment**

CAUTION

Use the shock absorber!

Operation without the shock absorber included within the scope of delivery is not permitted.

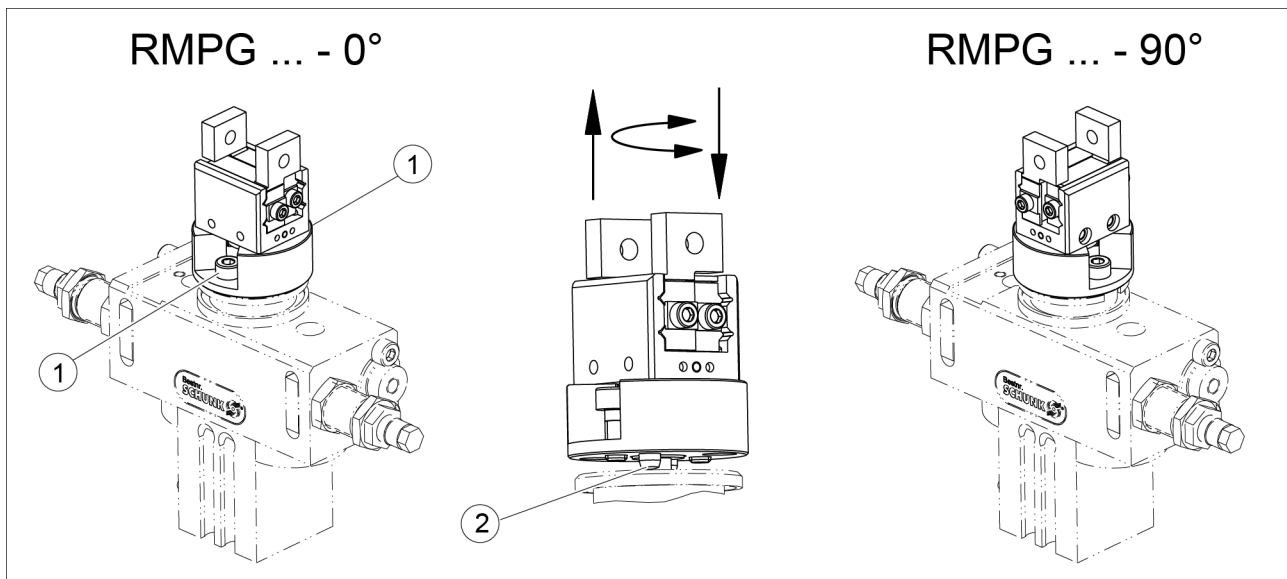
- Observe the maximum mass moment of inertia (see catalog).
- Adjust the dampening at the mass moment of inertia.
- See chapter Setting the swiveling time.

-
- The desired angle of rotation has been set.
1. Release counter nut (19).
 2. By turning the shock absorber (18) in and out, the stroke of the shock absorber (and therefore the shock absorber characteristic curve) can now be adjusted to the mass moment of inertia occurring in operation.
The previously adjusted angle of rotation is not influenced by this.
 3. Tighten the absorber again with the counter nut.

5.7 Conversion of the variants 0° / 90°

The gripping module is delivered in the variants RMPG ...- 0° and RMPG ...- 90°.

The module can also be converted to the other variant.



Conversion of the gripper head

1. Detach the mounting screws (1).



⚠ WARNING

Components are under spring tension!

Carefully clamp the module between the housing (12) and the gripper head (2). Remove screws and slowly unclamp the springs.

2. Pull the gripper head with the adapter upwards until the centering (2) no longer grips and turn the gripper head.

NOTE

In the IS version, the components are pulled down by spring force. If necessary, disassemble the module as described in the chapter "Disassembling the module" ▶ 7.4 [37] and release the spring.

3. Center the gripper head and tighten the mounting screws.

6 Troubleshooting

6.1 Gripping movement

6.1.1 Modul does not move?

Possible cause	Corrective action
Base jaws jam in housing, e.g. mounting surface is not sufficiently even.	Check the evenness of the mounting surface. ▶ 5.1 [□ 19] Loosen the mounting screws of the product and actuate the product again.
Pressure drops below minimum.	Check air supply. ▶ 5.2 [□ 20]
Compressed air lines switched.	Check compressed air lines.
Proximity switch defective or set incorrect.	Readjust or change sensor.
Unused air connections open.	Close unused air connections.
Component part defective.	Replace component or send it to SCHUNK for repair.

6.1.2 The module does not travel through the entire stroke?

Possible cause	Corrective action
Dirt deposits between the base jaws and the gripper head guide	Disassemble and clean the gripper head ▶ 7.4 [□ 37]
Pressure drops below minimum.	Check air supply. ▶ 5.2 [□ 20]
Mounting surface is not sufficiently flat.	Check the evenness of the mounting surface. ▶ 5.1 [□ 19]
Component part defective.	Send product with a SCHUNK repair order or dismantle product.

6.1.3 Module opens or closes abruptly?

Possible cause	Corrective action
Too little grease in the mechanical guiding areas.	Clean and lubricate product. ▶ 7 [□ 34]
Compressed air lines blocked.	Check compressed air lines of damage.
Mounting surface is not sufficiently flat.	Check the evenness of the mounting surface.
Loading too large.	Check permissible weight and length of the gripper fingers. ▶ 5.1 [□ 19]

6.1.4 Gripping force is dropping

Possible cause	Corrective action
Compressed air can escape.	Check seals, if necessary, disassemble the product and replace seals.
Too much grease in the mechanical movement space.	Clean and lubricate product.
Pressure drops below minimum.	Check air supply. ▶ 3 [□ 16]
Component part defective.	Replace component or send it to SCHUNK for repair.

6.1.5 Module does not achieve the opening and closing times?

Possible cause	Corrective action
Compressed air lines are not installed optimally.	<p>If present: Open the flow control couplings on the product to the maximum that the movement of the jaws occurs without bouncing and hitting.</p> <p>Check compressed air lines.</p> <ul style="list-style-type: none"> • Inner diameters of compressed air lines are of sufficient size in relation to compressed air consumption. • Keep compressed air lines between the product and directional control valve as short as possible. • Flow rate of valve is sufficiently large relative to the compressed air consumption.
Loading too large.	Check permissible weight and length of the gripper fingers.

6.2 Rotary movement

6.2.1 Modul does not move?

Possible cause	Corrective action
Pressure drops below minimum.	Check air supply. ▶ 5.2 [□ 20]
Compressed air lines switched.	Check compressed air lines.
Proximity switch defective or set incorrect.	Readjust or change sensor.
Unused air connections open.	Close unused air connections.
Flow control valve closed.	Open the flow control valve.

6.2.2 Does the module not travel through the rotating angle?

Possible cause	Corrective action
The end positions are incorrectly adjusted	Readjust the end positions
Pressure drops below minimum.	Check air supply. ▶ 5.2 [□ 20]
Mounting surface is not sufficiently flat.	Check the evenness of the mounting surface. ▶ 5.1 [□ 19]
Component part defective.	Send product with a SCHUNK repair order or dismantle product.
Shock absorber defective	Check or, if need be, replace the shock absorber

6.2.3 End position signal not present?

Possible cause	Corrective action
Precisely adjust the sensor for the stop	Readjust the sensor
Proximity switch defective or set incorrect.	Readjust or change sensor.
Cable breakage	Replace the sensor cable

6.2.4 Torque is diminishing

Possible cause	Corrective action
Seals of the drive piston defective.	Send product with a SCHUNK repair order or dismantle product.
	Replace the seals.
Positioning of the swivel table defective.	Send product with a SCHUNK repair order or dismantle product.
Compressed air lines blocked.	Check compressed air lines of damage.
Pressure drops below minimum.	Check air supply. ▶ 5.2 [□ 20]

6.2.5 Product rotates abruptly

Possible cause	Corrective action
Seals of the drive piston defective.	Send product with a SCHUNK repair order or dismantle product.
	Replace the seals of the drive piston.
Positioning of the swivel table defective.	Send product with a SCHUNK repair order or dismantle product.
Compressed air lines blocked.	Check compressed air lines of damage.

6.2.6 Does the module move hard against the end positions?

Possible cause	Corrective action
Fine adjustment of the absorber stroke is faulty	Readjust absorber stroke.
Absorber defective	Replace and readjust absorbers.
The exhaust air throttle is defective	Replace the exhaust air throttle.
Speed of rotation too high	Adjust the exhaust air throttle.

7 Maintenance

7.1 Notes

Original spare parts

Use only original spare parts of SCHUNK when replacing spare and wear parts.

7.2 Maintenance and lubrication intervals

7.2.1 Gripping module

- Grease the gripping module at the specified intervals at the specified points.
- Check the gripping module for leaks and damage.
- Disassemble the gripping module only for repair!

CAUTION

Material damage due to hardening lubricants!

Lubricants harden more quickly at temperatures above 60°C, leading to possible product damage.

- Reduce the lubricant intervals accordingly.

Size	0612 - 1020
Interval [Mio. cycles]	2

7.2.2 Rotary module

CAUTION

Material damage due to hardening lubricants!

Lubricants harden more quickly at temperatures above 60°C, leading to possible product damage.

- Reduce the lubricant intervals accordingly.

Interval (million cycles)		Maintenance work
2		Check for leaks
4 (recommendation)		Re-lubricate the gear rack and pinion unit (RM-F 15, RM-F 21)
2	Variant for sizes 12 and 15: 6	Replace shock absorber
Recommendation for safe operation		

7.3 Lubricants/greasing areas (basic lubrication)

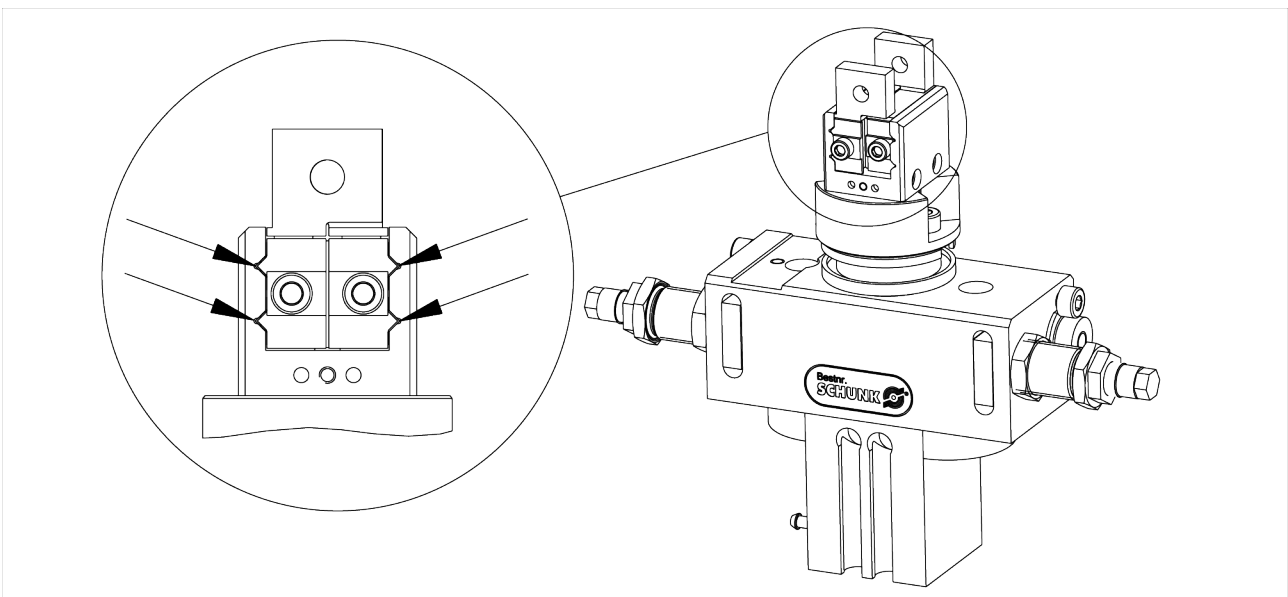
7.3.1 Gripping module

SCHUNK recommends the lubricants listed.

During maintenance, treat all greased areas with lubricant. Thinly apply lubricant with a lint-free cloth.

Lubricant point	Lubricant
Linear bearing gripping module	Isoflex-Topas NCA 52 (from Klüber)
All seals	
Bore hole at the piston	

* Only after disassembling the module for repairs



Linear bearing gripping module greasing areas

-> Apply the grease directly to the runways (arrows).

7.3.2 Rotary module

- All module bearings are life-time lubricated and do not need to be re-lubricated.
- When disassembling the module for repairs, all bearings have to be cleaned and re-lubricated.

SCHUNK recommends the lubricants listed.

During maintenance, treat all greased areas with lubricant. Thinly apply lubricant with a lint-free cloth.

Greasing areas, lubricant

Lubricant point	Lubricant
Gear rack and pinion unit *	Isoflex-Topas NCA 52 (from Klüber)
All seals *	
Rolling element and sliding surfaces of the bearings *	

* Only after disassembling the module for repairs

7.4 Disassembly of the module

7.4.1 Gripping module

7.4.1.1 Version without gripping force maintenance

Position of the item numbers ▶ 9 [42]



⚠ WARNING

Risk of injury due to unexpected movements!

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.

1. Remove the compressed air line.
 2. Unscrew the screws (25) and remove the housing (12).
 3. Unscrew the screws (26) and remove the drive components (8 / 9 / 10 / 20 / 21 / 22).
- If necessary, further disassemble the module as shown in the chapter "Assembly drawing" ▶ 9 [42].

7.4.1.2 Maintenance of module with gripping force maintenance "O.D. gripping" (O.D.)

Position of the item numbers ▶ 9 [42]



⚠ WARNING

Risk of injury due to unexpected movements!

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.



⚠ WARNING

Risk of injury due to spring forces!

The cylinder piston is under spring tension.

- Carefully disassemble the product.

1. Remove the compressed air line.
2. Carefully clamp the module between the housing (12) and the gripper head (2).
3. Remove the screws (25).



⚠ WARNING

Risk of injury due to spring forces!

The housing can be ejected by high spring forces.

Carefully disassemble the module.

4. Slowly unclamp the spring and remove the housing (12).
 5. Unscrew the screws (26) and remove the drive components (8 / 9 / 10 / 20 / 21 / 22).
- If necessary, further disassemble the module as shown in the chapter "Assembly drawing" ▶ 9 [□ 42].

7.4.1.3 Version with gripping force maintenance I.D.

Position of the item numbers ▶ 9 [□ 42]



⚠ WARNING

Risk of injury due to unexpected movements!

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.



⚠ WARNING

Risk of injury due to spring forces!

The cylinder piston is under spring tension.

- Carefully disassemble the product.

1. Remove the compressed air line.
 2. Unscrew the screws (25) and remove the housing (12).
 3. When loosening the screw (26), exert pressure on the guide plug (8) to remove the spring tension from the screw.
 4. Carefully unload the spring after unscrewing the screw and pull off the drive components (8 / 9 / 10 / 20 / 21 / 22).
- If necessary, further disassemble the module as shown in the chapter "Assembly drawing" ▶ 9 [□ 42].

7.4.2 Rotary module

CAUTION

A high degree of expertise is required for the disassembly and assembly of the module, ▶ 2.7 [□ 10].

The repair or elimination of defects by the customer on the module results in the termination of the warranty and liability for all resulting warranty and subsequent damage.

- It is recommended to have SCHUNK repair damaged and defective modules.



⚠ WARNING

Risk of injury when the machine/system moves unexpectedly!

Switch off power supply.

- Disassemble the module as shown in the chapter "RM assembly drawings" ▶ 9.2 [□ 43].
- **Only disassemble the rotary module for repair purposes.**

7.5 Servicing and assembling the module



⚠ WARNING

Risk of injury due to spring forces!

The cover may be ejected due to the high spring forces.

- Dismantle the product carefully.



⚠ WARNING

Risk of injury due to spring forces!

When mounting the spring (18), use suitable devices and aids.

Maintenance

- Clean all parts thoroughly and check for damage and wear.
- Treat all greased areas with lubricant.
▶ 7.3 [□ 35]
- Oil or grease bare external steel parts.
- Replace all wear parts / seals.
 - Position of the wearing parts ▶ 9 [□ 42]
 - Seal kit ▶ 8.1 [□ 41]

Assembly

Assembly takes place in the opposite order to disassembly.
Observe the following:

- Unless otherwise specified, secure all screws and nuts with Loctite no. 243 and tighten with the appropriate tightening torque.

8 Spare parts

Position of the item numbers ▶ 9 [□ 42]

8.1 Seal kit

ID.-No. of the seal kit

Seal kit for	Designation	ID number
RMPG 0612	RMPGDI 0612	0313491
RMPG 0812	RMPGDI 0812	0313492
RMPG 0816	RMPGDI 0816	0313493
RMPG 1016	RMPGDI 1016	0313494
RMPG 1020	RMPGDI 1020	0313495

Contents of the sealing kit, ▶ 9 [□ 42].

8.2 Shock absorber

ID of the shock absorber

Shock absorber for	Designation	ID number
RMPG 0612	-	-
RMPG 0812	Shock absorber	9953565
RMPG 0816	Shock absorber	9953565
RMPG 1016	Shock absorber	9953760
RMPG 1020	Shock absorber	9953760

8.3 Centering and fastening elements

ID of the centering and fastening elements

Item	Designation	ID number
15 *	Hose clip M2.5	9942298
16 *	Sealing disk M2.5	9942299
17	Centering sleeve Ø5x2.5	0313399

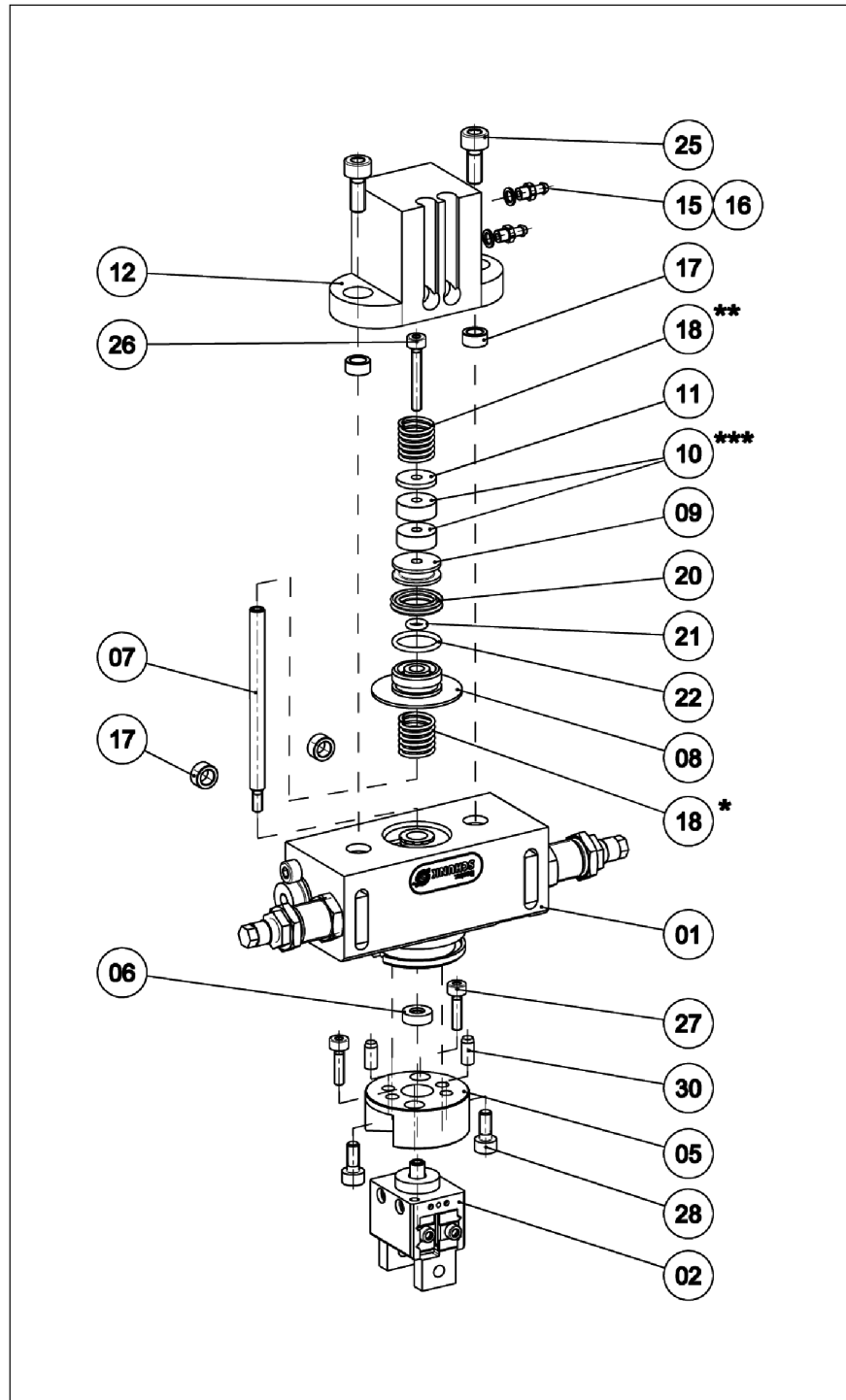
* Valid for RMPG 0612 / 0812 / 0816 / 1016

9 RMPG assembly drawing

9.1 Full drawing

The following figure is an example image.

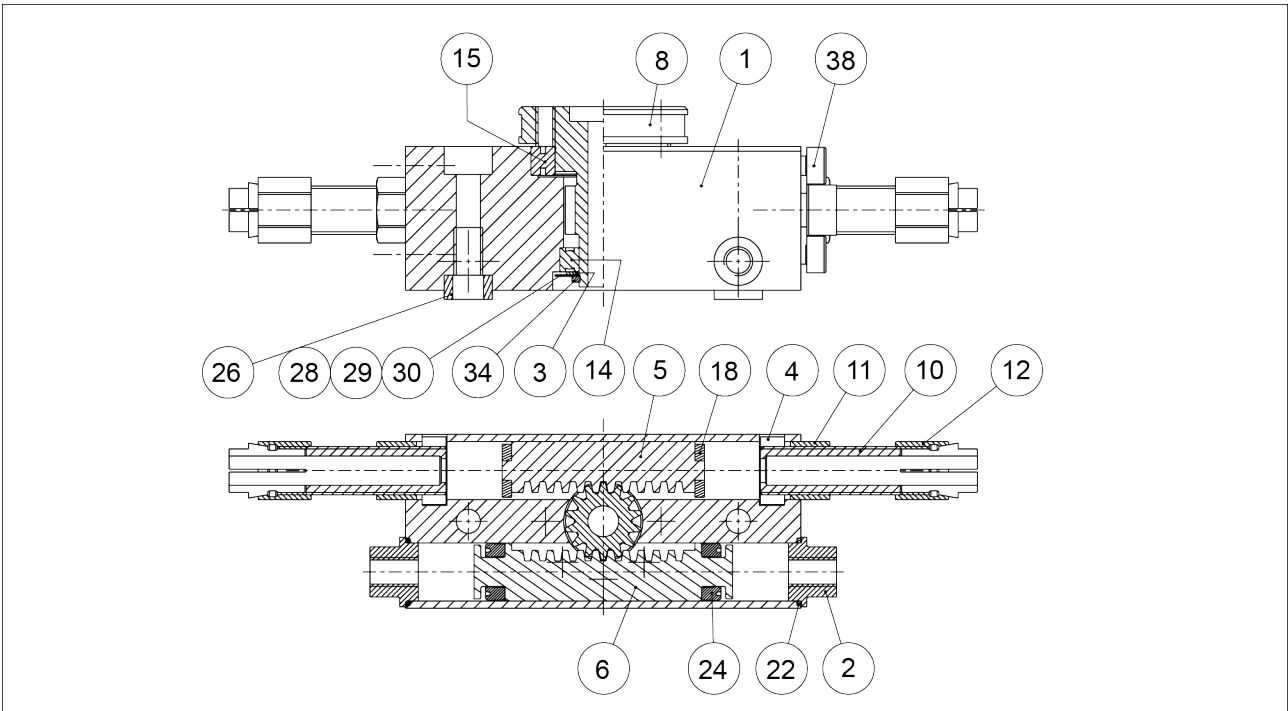
It serves for illustration and assignment of the spare parts.
Variations are possible depending on size and variant.



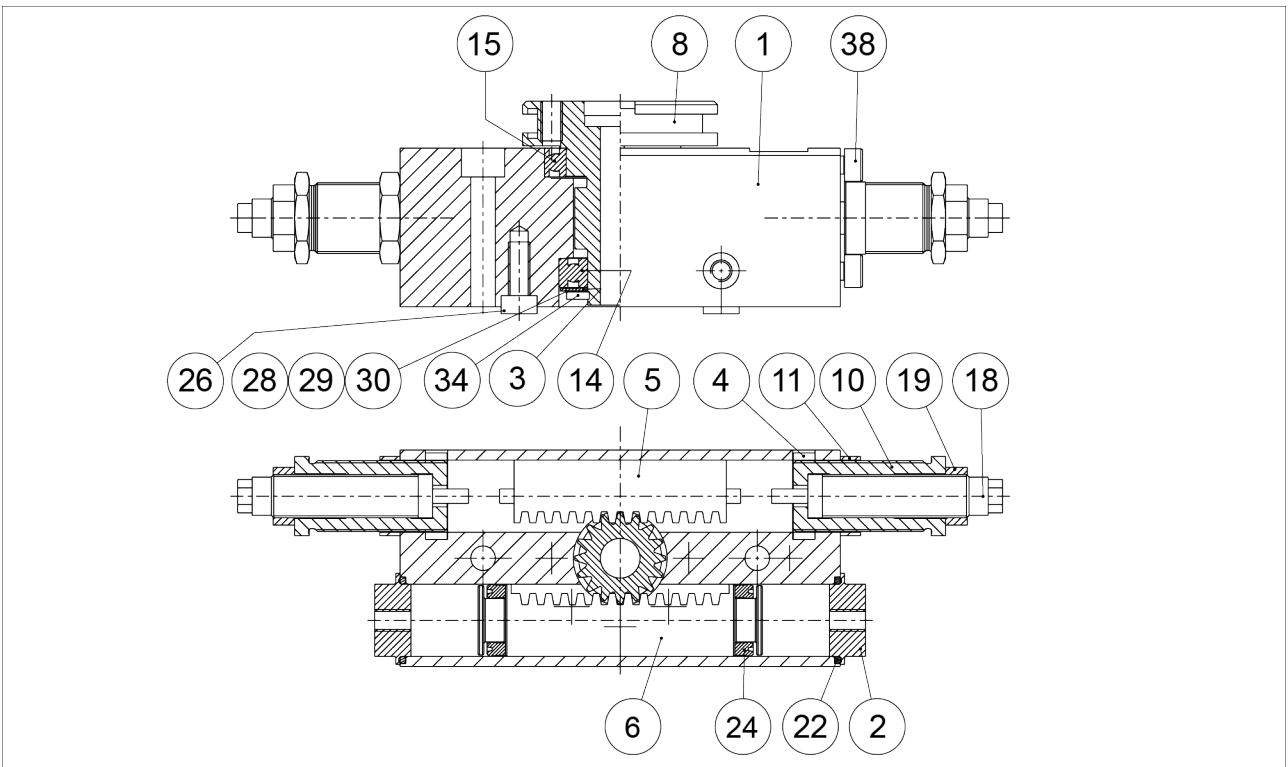
RMPG assembly

- * Applies only to IS version
- ** Applies only to AS version
- *** Install south pole to south pole!

9.2 Drawing RM 06-10



Assembly of RM 06



Assembly of RM 08, RM10

10 Translation of original declaration of incorporation

in terms of the Directive 2006/42/EG, Annex II, Part 1.B of the European Parliament and of the Council on machinery.

Manufacturer/
Distributor

SCHUNK GmbH & Co. KG Clamping and gripping technology
Bahnhofstr. 106 - 134
D-74348 Lauffen/Neckar

We hereby declare that on the date of the declaration the following partly completed machine complied with all basic safety and health regulations found in the directive 2006/42/EC of the European Parliament and of the Council on machinery. The declaration is rendered invalid if modifications are made to the product.

Product designation: Gripper swivel module / RMPG / pneumatic
ID number 0313581... 0313602

The partly completed machine may not be put into operation until conformity of the machine into which the partly completed machine is to be installed with the provisions of the Machinery Directive (2006/42/EC) is confirmed.

Applied harmonized standards, especially:

EN ISO 12100:2010 Safety of machinery - General principles for design -
Risk assessment and risk reduction

The manufacturer agrees to forward on demand the relevant technical documentation for the partly completed machinery in electronic form to national authorities.

The relevant technical documentation according to Annex VII, Part B, belonging to the partly completed machinery, has been created.

Person authorized to compile the technical documentation:
Robert Leuthner, Address: see manufacturer's address

Signature: see original declaration

Lauffen/Neckar, August 2021

p.p. Ralf Winkler;
Head of Technology & Engineering,
Mechanics Gripping Systems

10.1 Annex to Declaration of Incorporation

according 2006/42/EG, Annex II, No. 1 B

1. Description of the essential health and safety requirements pursuant to 2006/42/EC, Annex I that are applicable and that have been fulfilled with:

Product designation	Gripper swivel module
Type designation	RMPG
ID number	0313581... 0313602

To be provided by the System Integrator for the overall machine	↓
Fulfilled for the scope of the partly completed machine	↓
Not relevant	↓

1.1	Essential Requirements			
1.1.1	Definitions		X	
1.1.2	Principles of safety integration		X	
1.1.3	Materials and products		X	
1.1.4	Lighting		X	
1.1.5	Design of machinery to facilitate its handling		X	
1.1.6	Ergonomics		X	
1.1.7	Operating positions			X
1.1.8	Seating			X

1.2	Control Systems			
1.2.1	Safety and reliability of control systems		X	
1.2.2	Control devices		X	
1.2.3	Starting		X	
1.2.4	Stopping		X	
1.2.4.1	Normal stop		X	
1.2.4.2	Operational stop		X	
1.2.4.3	Emergency stop		X	
1.2.4.4	Assembly of machinery		X	
1.2.5	Selection of control or operating modes		X	
1.2.6	Failure of the power supply			X

1.3	Protection against mechanical hazards			
1.3.1	Risk of loss of stability			X
1.3.2	Risk of break-up during operation			X
1.3.3	Risks due to falling or ejected objects			X
1.3.4	Risks due to surfaces, edges or angles		X	
1.3.5	Risks related to combined machinery			X
1.3.6	Risks related to variations in operating conditions			X

1.3	Protection against mechanical hazards			
1.3.7	Risks related to moving parts		X	
1.3.8	Choice of protection against risks arising from moving parts			X
1.3.8.1	Moving transmission parts		X	
1.3.8.2	Moving parts involved in the process			X
1.3.9	Risks of uncontrolled movements			X
1.4	Required characteristics of guards and protective devices			
1.4.1	General requirements			X
1.4.2	Special requirements for guards			X
1.4.2.1	Fixed guards			X
1.4.2.2	Interlocking movable guards			X
1.4.2.3	Adjustable guards restricting access			X
1.4.3	Special requirements for protective devices			X
1.5	Risks due to other hazards			
1.5.1	Electricity supply		X	
1.5.2	Static electricity		X	
1.5.3	Energy supply other than electricity		X	
1.5.4	Errors of fitting		X	
1.5.5	Extreme temperatures			X
1.5.6	Fire			X
1.5.7	Explosion			X
1.5.8	Noise			X
1.5.9	Vibrations			X
1.5.10	Radiation	X		
1.5.11	External radiation	X		
1.5.12	Laser radiation	X		
1.5.13	Emissions of hazardous materials and substances			X
1.5.14	Risk of being trapped in a machine	X		
1.5.15	Risk of slipping, tripping or falling	X		
1.5.16	Lightning			X
1.6	Maintenance			
1.6.1	Machinery maintenance		X	
1.6.2	Access to operating positions and servicing points		X	
1.6.3	Isolation of energy sources		X	
1.6.4	Operator intervention		X	
1.6.5	Cleaning of internal parts		X	

1.7	Information			
1.7.1	Information and warnings on the machinery		X	
1.7.1.1	Information and information devices		X	
1.7.1.2	Warning devices		X	
1.7.2	Warning of residual risks		X	
1.7.3	Marking of machinery	X		
1.7.4	Instructions	X		
1.7.4.1	General principles for the drafting of instructions	X		
1.7.4.2	Contents of the instructions	X		
1.7.4.3	Sales literature	X		

	The classification from Annex 1 is to be supplemented from here forward.			
2	Supplementary essential health and safety requirements for certain categories of machinery			X
2.1	Foodstuffs machinery and machinery for cosmetics or pharmaceutical products			X
2.2	Portable hand-held and/or guided machinery			X
2.2.1	Portable fixing and other impact machinery			X
2.3	Machinery for working wood and material with similar physical characteristics			X
3	Supplementary essential health and safety requirements to offset hazards due to the mobility of machinery		X	
4	Supplementary essential health and safety requirements to offset hazards due to lifting operations		X	
5	Supplementary essential health and safety requirements for machinery intended for underground work			X
6	Supplementary essential health and safety requirements for machinery presenting particular hazards due to the lifting of persons		X	

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