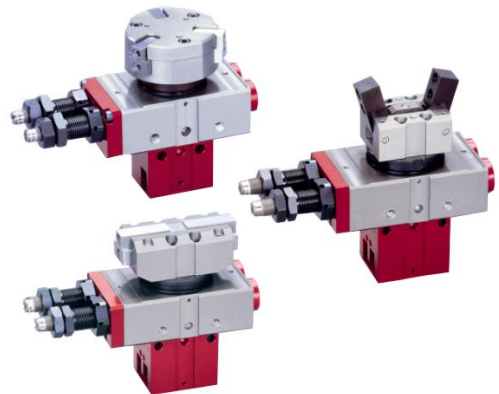


GRIPPER - ROTARY ACTUATORS

TYPES

RP, RW, RC 1212 TO
RP, RW, RC 2128



Dear Customer,

Congratulations on choosing a SCHUNK product. By choosing SCHUNK, you have opted for the highest precision, top quality and best service.

You are going to increase the process reliability of your production and achieve best machining results – to the customer's complete satisfaction.

SCHUNK products are inspiring.

Our detailed assembly and operation manual will support you.

Do you have further questions? You may contact us at any time – even after purchase. You can reach us directly at the mentioned addresses in the last chapter of these instructions.

Kindest Regards,

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Contents

1	SAFETY	4
1.1	SYMBOL KEY	4
1.2	APPROPRIATE USE	4
1.3	SAFETY NOTES.....	4
1.4	INDICATIONS TO THE OPERATING MANUAL.....	5
2	WARRANTY	6
3	SCOPE OF DELIVERY	6
4	TECHNICAL DATA	6
5	OPERATING AND ENVIRONMENTAL CONDITIONS	6
6	ASSEMBLY AND INSTALLATION	7
6.1	DESIGN PRECAUTIONS	7
6.2	COMPRESSED AIR SUPPLY	7
6.3	SPECIAL CONNECTING MEASURES.....	7
6.4	ASSEMBLY MEASURES.....	7
6.5	MEASURES FOR THE INITIAL OPERATION	8
7	HANDLING	9
7.1	END POSITION INTERROGATION.....	9
7.2	MODULAR DESIGN.....	9
8	REPAIRS	10
9	RESPONSE TO MALFUNCTIONS	10
10	MAINTENANCE AND CARE	10
10.1	DRIVE CYLINDERS	10
10.2	ROTARY ACTUATOR RM 12-15-21.....	11
10.3	GRIPPER ACTUATOR GMP/GMW/GMC 12-16-20-28	11
10.4	MAINTENANCE REPAIRS.....	11
11	REPLACEMENT PARTS	11
12	EC DECLARATION OF INCORPORATION	12
13	INDEX	13
14	CONTACT	14

1. Safety

1.1. Symbol Key



You will find this symbol wherever **hazards for persons or damage to the product** are possible.



This symbol indicates **important information** on the product or its handling.

1.2. Appropriate Use

The gripper - rotary actuators are manufactured in accordance with the current level of technology and with recognised safety regulations. During their use, however, there may occur risks to life and limb of the user or impairment of the portal actuator and other material assets.

The gripper - rotary actuators are intended exclusively for the swivelling and the radial, parallel and concentric gripping of service loads in any position that do not react in their manipulation with any risk to persons, property or the environment.

The maximum permissible service loads and forces are given in our standard catalogue. Any usage beyond these definitions is inappropriate.

The manufacturer cannot be held liable for loss or damage arising therefrom. The risk is borne exclusively by the user.

Usage in accordance with directions includes observation of the user manual as well as adherence to the maintenance and repair specifications prescribed by the manufacturer.

The gripper - rotary actuator must only be operated by persons that are familiar therewith and that have been instructed in the associated hazards. The relevant accident prevention regulations and the other generally recognised safety and occupational health regulations must be complied with.

1.3. Safety Notes

1. Responsibility for the compatibility of pneumatic equipment lies with the person who designs the pneumatic system or takes the decision on its specifications.

- Since the products specified herein can be used under various operating conditions, their compatibility with the appropriate pneumatic system must be based on specifications and/or tests in order to conform to their requirements.

2. Machines and equipment operated by pneumatic means may only be used by trained personnel.



- Compressed air can be hazardous if an operator is not familiar with its use. The assembly, handling or repair of pneumatic systems is to be undertaken by trained and experienced personnel.

3. Do not carry out maintenance work on machines and equipment and do not attempt to remove components until it has been confirmed that it is safe to do so.



- Inspection and maintenance of machines and equipment may only be carried out after it has been confirmed that the devices that must be switched off are in a securely deactivated condition.
- If machine parts must be removed, carry out safety precautions as mentioned above. Deactivate the compressed air supply to this machine and release any remaining compressed air from the system.
- Before machines and equipment are switched on again, take measures to ensure that cylinder rods etc. are not pushed outwards. Allow compressed air to enter the system slowly so that counterpressure builds up gradually.

4. Contact SCHUNK (see chapter 14 page 14) if the product is to be used under one of the following conditions:

- Conditions and environments that lie outside the stated specifications, or where the product is to be used outdoors.
- Installation in equipment in conjunction with nuclear power, railways, aerospace, vehicles, medical equipment, food and drink, leisure equipment, emergency shutdown circuits, applications in presses or safety equipment.
- Any application that may possibly have negative influences on persons, animals or property and that requires a special safety analysis.

5. This user manual should always be easily accessible

1.4. Indications to the operating manual

This user manual describes gripper - rotary actuators of series RP/RW/RC 1212, 1216, 1520, 2120 and 2128.

All statements in this user manual refer to the types stated above and their individual components.

All other descriptions are given in the user manuals for the individual components.

- Operating manual RM12-21
- Operating manual GMP12-28
- Operating manual GMW12-28
- Operating manual GMC12-28

SCHUNK gripper - rotary actuators are of a modular design and consist of the following components (in all combination stages):

- Rotary actuators RM 12 - RM 15 - RM 21
- Parallel gripper actuators GMP 12 - GMP 16 - GMP 20 - GMP 28
- Angled gripper actuators GMW 12 - GMW 16 - GMW 20 - GMW 28
- 3 jaw gripper actuators GMC 12 - GMC 16 - GMC 20 - GMC 28

The performance data of the individual components are available without restriction when they are combined in gripper - rotary actuators. This user manual therefore refers in some cases to the individual components.

2. Warranty

The warranty period is 24 months or 40 million load cycles after delivery date from the factory, assuming use in single-shift operation and that the recommended maintenance and lubrication intervals are respected. Components that come into contact with workpieces, wearing parts, shock absorbers, stop screws and proximity switches are never included in the warranty.

The warranty covers the replacement or repair of defective parts in the manufacturing plant. Further claims are hereby excluded. In this context, please also see our General Terms and Conditions.

3. Scope of Delivery

The scope of delivery comprises

- Gripper - rotary actuator RP/RW/RC, depending on the version ordered

4. Technical Data

Please consult our catalogue for further technical details.

The last version is valid in each case (in accordance with Chapter 2.3 General Terms and Conditions)

The airborne sound emitted from the unit is $\leq 70\text{dB(A)}$

5. Operating and environmental conditions

- Do not use the product in environments comprising corrosive gases, salt water, water or vapours.
- For use in an atmosphere where water drops, oil, sprays etc, occur take appropriate countermeasures in order to ensure protection.
- If electronic end switches are to be used, these should not be used in the presence of strong magnetic fields. Please contact SCHUNK (see chapter 14 page 14) if the product is to be used in the presence of strong magnetic fields.
- Do not use the gripper - rotary actuator in an atmosphere in which it could come into contact with fluids such as oil or water.
- Do not use the gripper - rotary actuator in an atmosphere in which it could come into direct contact with substances such as powder dust, dust, sprays etc.
- Do not use the gripper - rotary actuator in an atmosphere in which sources of heat are present.
- Do not subject the gripper - rotary actuator to excessive vibrations and/or shocks.

6. Assembly and Installation

6.1. Design precautions

- A protective guard is recommended in order to minimise the risk of injury.
- Ensure that loose, fixed and/or connected parts are tightened securely.
- Operation without the shock absorbers included as standard in the scope of delivery is not permissible.
- Take account of the possibility that the operating pressure may decrease as a result of power failures etc.
- Pay attention to the possibility of the failure of power supplies.
- Mount the compressed air supply in such a way as to prevent a gripping action.
- Pay attention to emergency shutdown facilities.
- Pay attention to what will happen after an emergency stop or abnormal stoppage. Ensure that nobody can be placed at risk or be injured when equipment is restarted.

6.2. Compressed air supply

- Use clean compressed air and insert a filter between the supply and the pneumatic system.
- Install a water separator in the pneumatic system.
- Use the product only within the range specified for the medium temperature and ambient temperature.

Air specification

- dry (free from condensation)
- filtered to 10 microns
- oiled or oil-free

6.3. Special connecting measures

- Use connecting pipes of a cross-section that is larger than or identical to that of the connector thread.
- Blow air through the connecting pipes before fitting the devices in order to remove any dust, contaminant or particles.
- Avoid the ingress of sealing material into the pipe network.
- Do not remove pneumatic components from their packaging until shortly before fitting.

6.4. Assembly measures

- During the mounting of the gripper - rotary actuator or gripper jaws on the gripper actuator, do not allow the system to be subjected to impermissible forces or moments.
- The flatness of the mounting surfaces must be less than 0.02mm.

- Avoid contact with the gripper - rotary actuator during operation.
- Select a suitable screw tightening torque for mounting of the gripper - rotary actuator or loads on the gripper jaws on the gripper actuator in accordance with the generally valid guidelines for screw connections.

6.5. Measures for the initial operation



Please read this user manual carefully. Knowledge of this user manual is essential in order to prevent errors and ensure problem-free operation.



Under no circumstances may Portal actuators be operated with oiled air if they are subsequently to be operated with oil-free air.

- Check the technical specifications.
- Do not use the device until you have checked that it functions correctly taking account of all permissible operating parameters.
- Regulate the operating speed of the cylinder by means of throttle type non-return valves. Increase from the low speed to higher speeds until the required operating speed is reached.

Selection and dimensioning

- Do not subject the units to loads that exceed the limits of their operating range. If excessive loads are applied, the guidance unit could suffer damage or inaccuracies. The maximum permissible loads are given in our standard catalogue.
- Do not allow the system to experience impermissible forces or shocks and do not use excessively long gripper jaws.

7. Handling

7.1. End position interrogation

Standardised interrogation sets for direct mounting are available for interrogation of end positions.

The scope of delivery, mounting and adjustment is described in the operating manual for the individual components.

- Operating manual RM12-21
- Operating manual GMP12-28
- Operating manual GMW12-28
- Operating manual GMC12-28

7.2. Modular design

Gripper - rotary actuators of this series are of a completely modular design. All components are separate entities in terms of function. It is thus possible, on the basis of a small number of components, to configure a large number of different gripper actuators and gripper - rotary actuators.

The diagram below shows the complete modular set for configuration of gripper - rotary actuators RP-... with parallel gripper and RW-... with angled gripper, as well as RC-... with 3 jaw gripper.

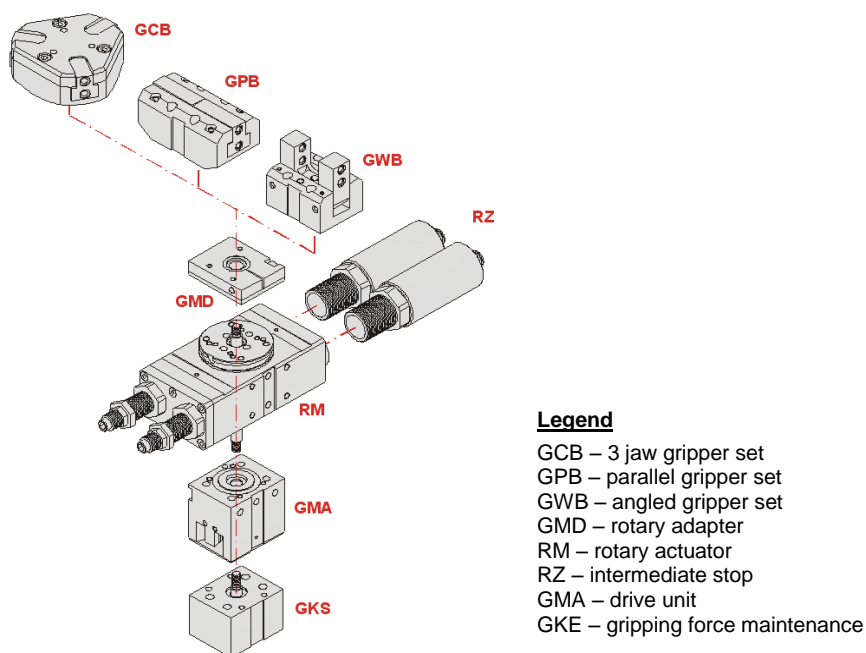


Figure 1: modular design

The individual components comprising the various gripper - rotary actuators are shown in tabular form in our standard catalogue.

8. Repairs



The repair or elimination of defects on our products by the customer may only be carried out with our explicit written agreement. Any failure to adhere to this principle renders invalid our warranty and liability for any resulting warranty or secondary losses.

Following receipt and examination, all gripper - rotary actuators of series RP/RW/RC can be repaired by SCHUNK.

9. Response to malfunctions



Malfunctions that are caused by defective components may only be remedied by replacement of these components.

Defective components may only be replaced by SCHUNK genuine replacement parts.

Causes of malfunctions and their remedies are described in the user manuals for the individual components.

- Operating manual RM12-21
- Operating manual GMP12-28
- Operating manual GMW12-28
- Operating manual GMC12-28

10. Maintenance and Care

10.1. Drive cylinders



Under no circumstances may gripper actuators be operated with oiled air if they are subsequently to be operated with oil-free air.

The integral cylinders are lubricated for life and do not require relubrication. Operation with oiled or oil-free compressed air is permissible without restrictions.

10.2. Rotary actuator RM 12-15-21

The bearing arrangements of the turntable and of the toothed rack pinion unit are already lubricated. It is not therefore necessary to lubricate these again before operation.

Lubrication or relubrication of the toothed rack pinion unit with rolling bearing grease is recommended after approx. 4 million cycles.

10.3. Gripper actuator GMP/GMW/GMC 12-16-20-28

The complete mechanism and gripper jaw guidance system or bearing arrangement are already lubricated. It is not therefore necessary to lubricate these again before operation.

Lubrication or relubrication with rolling bearing grease is recommended after approx. 4 million cycles.

10.4. Maintenance repairs

- All gripper - rotary actuators of this series are maintenancefree. In order to achieve the maximum operating life, In order to achieve the maximum operating life, this chapter and chapter 6.2 (at page 7) of this operating manual should be observed.
- Apart from normal cleaning of machines, no further maintenance measures are necessary.

11. Replacement parts

Replacement and wear parts are described in the operating manuals for the individual components.

- Operating manual RM12-21
- Operating manual GMP12-28
- Operating manual GMW12-28
- Operating manual GMC12-28

12. EC declaration of incorporation

In terms of the EC Machinery Directive 2006/42/EC, annex II B

Manufacturer/
distributor SCHUNK GmbH & Co. KG.
 Spann- und Greiftechnik
 Bahnhofstr. 106 – 134
 74348 Lauffen/Neckar, Germany

We hereby declare that the following product:

Product designation Gripping Rotary modules pneumatic
Type designation: RP, RW, RC 1212... RP, RW, RC 2128
ID number: 0313220...0313325

meets the applicable basic requirements of the Directive **Machinery (2006/42/EC)**.

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

Applied harmonized standards, especially:

EN ISO 12100-1 Safety of machines - Basic concepts, general principles for design -- Part 1:
 Basic terminology, methodology
EN ISO 12100-2 Safety of machines - Basic concepts, general principles for design -- Part 2:
 Technical principles

The manufacturer agrees to forward on demand the special technical documents for the incomplete machine to state offices.

The special technical documents according to Annex VII, Part B, belonging to the incomplete machine have been created.

Person responsible for documentation: Mr. Michael Eckert, Tel.: +49(0)7133/103-2204

Location, date/signature: Lauffen, Germany,
 January 2010

p.p.



Title of the signatory Director for Development

13. Index

A

Air specification6
 Assembly.....6
 Assembly measures7

C

cleaning of machines10
 Compressed air supply6
 connecting measures6

D

Data
 technical5
 Design precautions6
 dimensioning7

E

EC Machine Directive11
 End position interrogation8
 environmental conditions5

H

Handling 8

I

Indication
 operating manual 4
 initial operation..... 7

M

Machine directive
 EC Machine Directive 12
 Maintenance and Care 9
 malfunctions 9

O

Operating 5

R

Repairs 9
 Replacement parts..... 10

S

Safety notes3
 Scope of delivery5
 Symbol key3

T

Terms and conditions
 general.....5

U

Use
 appropriate3

W

Warranty5

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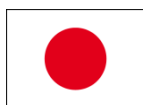
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