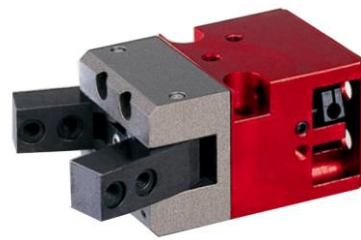


# GRIPPER ACTUATOR

## TYPES

### GMW 12 TO

### GMW 28



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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Document last updated: 23.02.2010





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## 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 unit must only be used within the scope of its technical data. Appropriate use also includes compliance with the conditions the manufacturer has specified for commissioning, assembly, operation, environment and maintenance. Using the unit with disregard to even a minor specification will be deemed inappropriate use. The manufacturer assumes no liability for any injury or damage resulting from inappropriate use.

The gripper 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 actuators are intended exclusively for the parallel 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.

The gripper 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 Fehler! Verweisquelle konnte nicht gefunden werden. page Fehler! Textmarke nicht definiert.) 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 actuators of series GMW 12, GMW 16, GMW 20 and GMW 28.

All statements in this user manual refer to the types stated above.

## 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 actuator GMW, 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 **Fehler! Verweisquelle konnte nicht gefunden werden.** page **Fehler! Textmarke nicht definiert.**) if the product is to be used in the presence of strong magnetic fields.
- Do not use the gripper actuator in an atmosphere in which it could come into contact with fluids such as oil or water.
- Do not use the gripper 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 actuator in an atmosphere in which sources of heat are present.
- Do not subject the gripper 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.
- 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 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 actuator during operation.
- Select a suitable screw tightening torque for mounting of the gripper actuator or loads 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 gripper 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 gripper jaw guidance system and closing mechanism 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. The maximum permissible gripper jaw length is given in our standard catalogue.

## 7 Handling

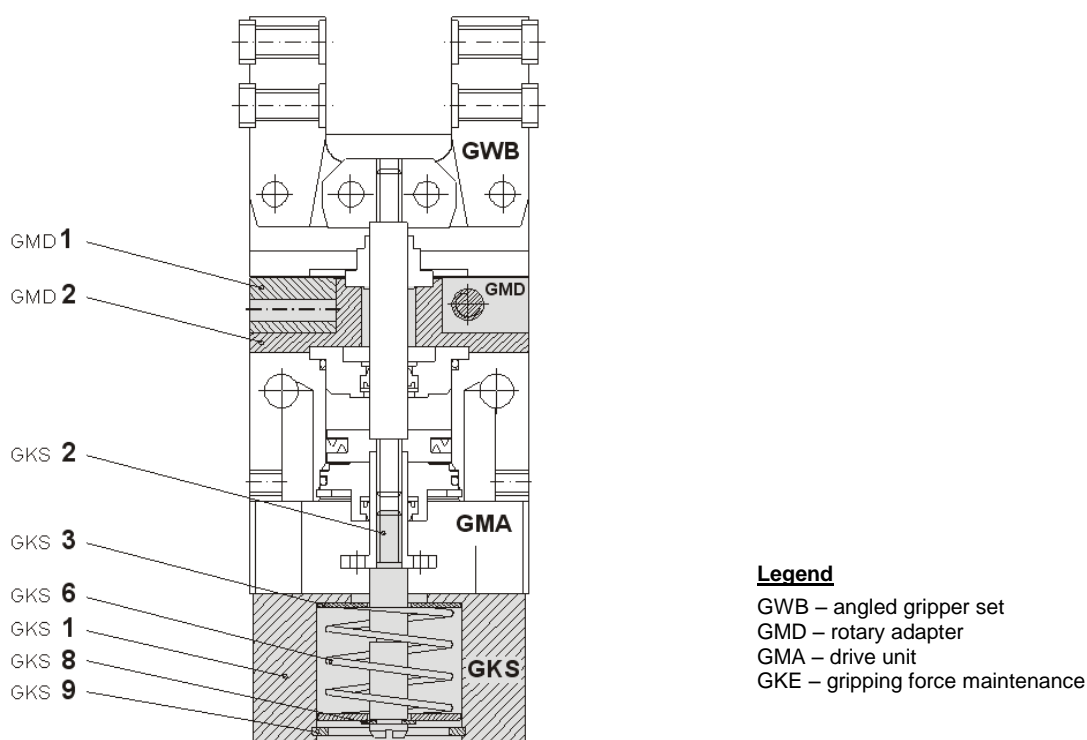
### 7.1 Gripping force maintenance

In order to secure the grip force in the event of pressure loss, an additional module can be fitted without the need for further accessories. The gripping force maintenance is available for operation in either a clamping or an expanding direction.

#### Ordering numbers of Grip force safety device:

- GKE 12 for gripper actuator GMW 12
- GKE 16 for gripper actuator GMW 16
- GKE 20 for gripper actuator GMW 20
- GKE 28 for gripper actuator GMW 28

If a gripper actuator including a gripping force maintenance as described in our standard catalogue is ordered, it is supplied with the spring already installed by SCHUNK.



**Figure 1: gripping force maintenance**

In order to switch the gripping force maintenance from clamping to expanding mode, the locking disc (Pos. 8) is fitted in the upper groove in the rod (Pos. 2).



## 7.2 Rotary adapter

For stepless rotation of the gripper set GWB-... on the drive unit GMA-... a rotary adapter GMD-... is available. This is installed between the gripper set and drive unit.

### Ordering numbers of the rotary adapter:

- GMD 12 for gripper actuator GMW 12
- GMD 16 for gripper actuator GMW 16
- GMD 20 for gripper actuator GMW 20
- GMD 28 for gripper actuator GMW 28

If a gripper actuator including a rotary adapter as described in our complete catalogue is ordered, it is supplied with the rotary adapter already installed by SCHUNK.

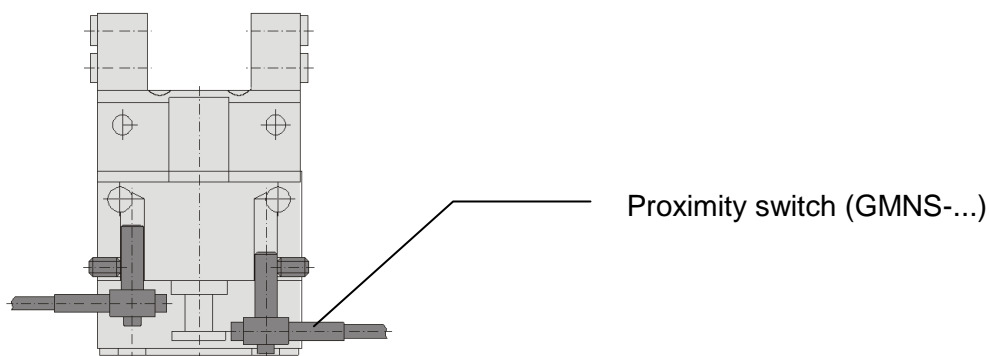
## 7.3 End position interrogation

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

- Proximity switch - complete GMNS-...

The scope of delivery includes:

- 1x retaining element
- 1x proximity switch
- 1x connection cable



**Figure 2: position from the proximity switch**

After the clamping screw has been loosened, the proximity switch can be set by means of the retaining element. Interrogation is carried out on the single-piece piston rod of the drive unit. It is possible to install up to 4 interrogation sets in types GMW 16, GMW 20 and GMW as shown, allowing interrogation of 4 gripper jaw positions. Only 2 interrogation sets can be installed in type GMW 12.



**In order to fit the retaining elements, the cover of the drive unit or the gripping force maintenance must be removed. This is not necessary for fitting of the proximity switch.**

### 7.4 Modular design

Gripper 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/indexing actuators. The diagram below shows the complete modular set for configuration of parallel gripper actuators **GMP**-... and angled gripper actuators **GMW**-... as well as 3 jaw gripper actuators **GMC**...

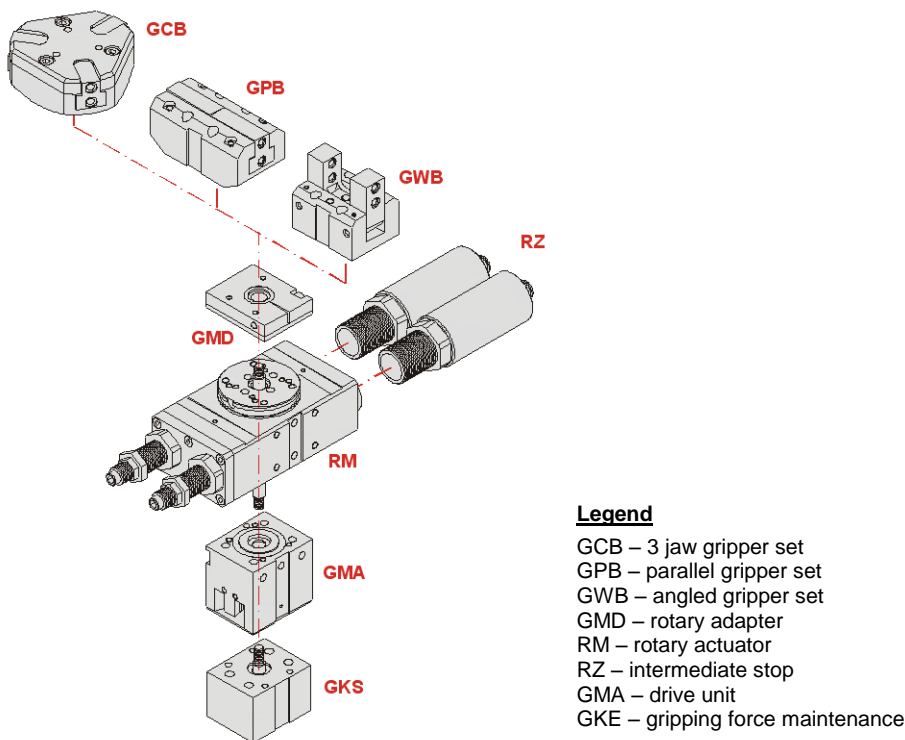


Figure 3: modular design

## 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 actuators of series GMW 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.

| Malfunction   | Cause  | Remedy  |
|---|--|---|
| <b>Gripper actuator does not open/close</b>           | (1) No compressed air<br>(2) Incorrect pneumatic connections                           | (1) Check compressed air<br>(2) Check pneumatic elements  |
| <b>End position signal not present</b>                | (1) Initiator incorrectly set<br>(2) Initiator defective<br>(3) Broken cable           | (1) Readjust initiator<br>(2) Replace initiator<br>(3) Replace initiator cable  |
| <b>Hard gripping of workpiece</b>                     | (1) Ventilation valve defective<br>(2) Stroke speed too high                           | (1) Change ventilation valve<br>(2) Set ventilation valve   |
| <b>Gripper cannot grip part or loses grip on part</b> | (1) Workpiece mass too high<br>(2) Gripper jaws too long<br><br>(3) Design not optimum | (1) Use larger gripper actuator<br>(2) Move gripping point further inwards<br>(3) Adapt design use physical lock gripping |

## 10 Maintenance and Care

 **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.
- The complete mechanism is already lubricated. It is not therefore necessary to lubricate this again before operation.  
Lubrication or relubrication of the mechanism with rolling bearing grease is recommended after approx. 4 million cycles.
- All gripper actuators of series GMW are maintenance-free. In order to achieve the maximum operating life, this chapter and chapter 6 (at page 6) of this user manual should be observed.
- Apart from normal cleaning of machines, no further maintenance measures are necessary.

## 11 Replacement parts

As standardised wear part sets, seal sets are available. The scope of delivery includes all seals.

### Ordering numbers of the seal sets:

- GMDI 12 for gripper actuator GMW 12
- GMDI 16 for gripper actuator GMW 16
- GMDI 20 for gripper actuator GMW 20
- GMDI 28 for gripper actuator GMW 28

In accordance with the section drawing below, all other wear parts and individual parts are available as single items.

### Ordering numbers are as indicated in the following example

- GMA- Part-No. 1 GMA 20-01
- GWB- Part-No. 2 GWB 20-02

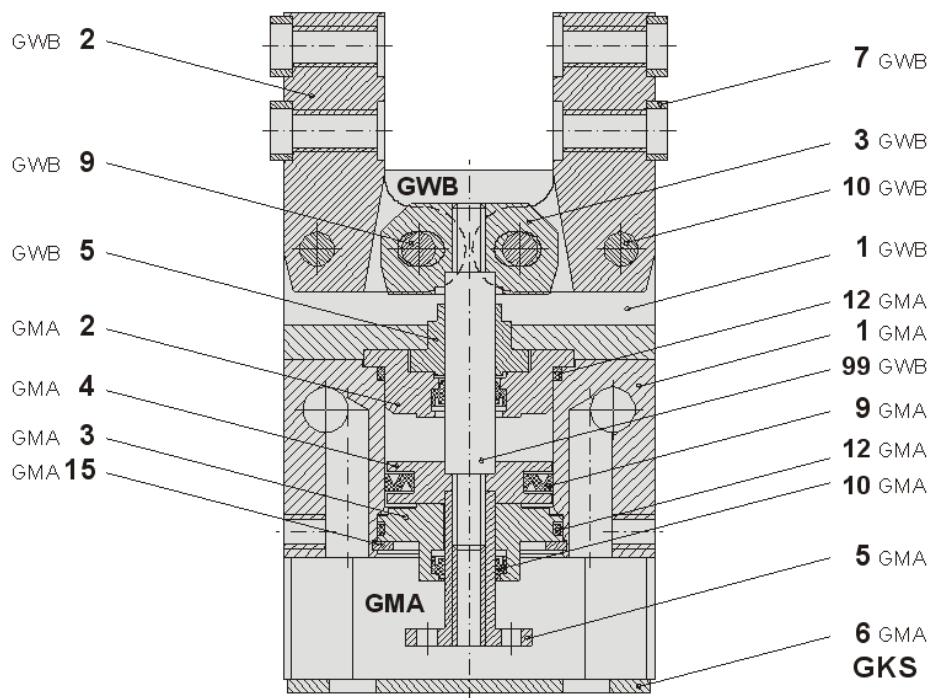


Figure 4: section drawing GMW

## 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**      Angular Gripper  
**Type designation:**        GMW 12...GMW 28  
**ID number:**                0313140...0313181

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.

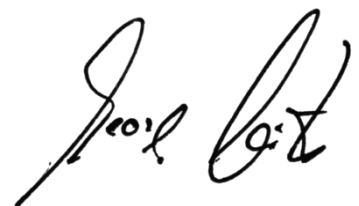
Applied harmonized standards, especially:

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

---

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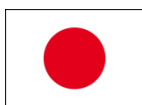
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