Magnetic gripper with shank interface GSW-M 20

Assembly and Operating Manual

Imprint

Technical changes:
We reserve the right to make alterations for the purpose of technical improvement.

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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.

Kindest Regards

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Reg. No. 003496 QM08 Reg. No. 003496 QM08

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1 About this manual

This instruction is an integral part of the product and contains important information for a safe and proper assembly, commissioning, operation, maintenance and help for easier trouble shooting.

Before using the product, read and note the instructions, especially the chapter "Basic safety notes".

1.1 Warnings

The following key words and symbols are used to highlight dangers.

1.1.1 Key words

DANGER	Dangers for persons. Non-compliance will inevitably cause irreversible injury or death.
WARNING	Dangers for persons. Non-compliance may cause irreversible injury or death.
CAUTION	Dangers for persons. Non-observance may cause minor injuries.
NOTICE	Information about avoiding material damage

1.1.2 Symbols

Warning about a danger point

Warning about hand injuries

General mandatory sign to prevent material damage

1.2 Applicable documents

- General terms of business
- Catalog data sheet of the purchased product

The documents listed here, can be downloaded on our homepage www.schunk.com

2 Basic safety notes

2.1 Intended use

The module was designed to attract and to temporarily hold ferromagnetic workpieces or objects.

The module is intended for installation in a machine/system. The requirements of the applicable guidelines must be observed and complied with.

The module may be used only in the context of its defined application parameters (☞ 6, Page 9).

The module is intended for industrial use.

To use this unit as intended, it is also essential to observe the technical data and installation and operation notes in this manual and to comply with the maintenance intervals.

2.2 Not intended use

NOTICE

The use of the GSW-V together with a shrink holder is to be seen as improper use. The manufacturer bears no liability for damage resulting from such use.

2.3 Environmental and operating conditions

- Make sure that the module has a sufficient size for the application.
- Observe Maintenance and lubrication intervals (☞ 10.2, Page 16).
- Make sure that the environment is free from splash water and vapors as well as from abrasion or processing dust. Exceptions are modules that are designed especially for contaminated environments.

2.4 Product safety

Dangers arise from the module, if:

- the module is not used in accordance with its intended purpose.
- the module is not installed or maintained properly.
- the safety and installation notes are not observed.

Avoid any manner of working that may interfere with the function and operational safety of the module.

Wear protective equipment.

NOTE
More information are contained in the relevant chapters.

2.4.1 Protective equipment

Provide protective equipment per EC Machinery Directive.

2.4.2 Constructional changes, attachments, or modifications

Additional drill holes, threads, or attachments that are not offered as accessories by SCHUNK may be attached only with permission of SCHUNK.

2.5 Personnel qualification

The assembly, initial commissioning, maintenance, and repair of the module may be performed only by trained specialist personnel. Every person called upon by the operator to work on the module must have read and understood the complete assembly and operating manual, especially the chapter "Basic safety notes" (☞ 2, Page 5). This applies particularly to personnel only used occasionally, such as maintenance personnel.

2.6 Notes on particular risks

Generally valid:

- Remove the energy supplies before installation, modification, maintenance, or adjustment work.
- Make sure that no residual energy remains in the system.
- Do not move parts by hand when the energy supply is connected.
- Do not reach into the open mechanism or the movement area of the module.
- Perform maintenance, modifications, and additions outside of the danger zone.
- For all work, secure the unit against accidental operation.
- Take a precautionary approach by maintenance and disassembly.
- Only specially trained staff should disassemble the module.

⚠ WARNING

Risk of injury from objects falling and being ejected

- The danger zone must be surrounded by a safety fence during operation.

⚠ WARNING

While disassembling uncontrollable moves of parts of the gripper possible!

3 Warranty

The warranty is valid for 24 months from the delivery date to the production facility under the following conditions:

- Intended use in 1-shift operation
- Observe the mandatory maintenance and lubrication intervals
- Observe the environmental and operating conditions

Parts touching the work piece and wear parts are not part of the warranty.

4 Scope of delivery

The scope of delivery includes:

- Magnetic gripper with shank interface GSW-M in the ordered model.

5 Accessories

A wide range of accessories are available for this module.

For information about which accessories can be used with the appropriate product version ☞ catalog.

6 Technical data

Size	20
Mechanical operating data	
Weight [kg]	1.0
Gripping force [N]	20
Wiper [mm]	20
Max. rotation speed [min^{-1}]	20
Ambient temperature [°C] Min. Max.	 -10 90
IP rating	44
Noise emission [dB(A)]	≤ 70
Operating data for media connection	
Pressure medium	Compressed air, standard for quality of the compressed air according to ISO 8573-1: 7 4 4 Machine cooling fluid
Nominal working pressure [bar] (Compressed air)	6
Min. pressure [bar] (Compressed air)	4
Max. pressure [bar] (Compressed air)	8
Nominal working pressure [bar] (Machine cooling fluid)	40
Min. pressure [bar] (Machine cooling fluid)	20
Max. pressure [bar] (Machine cooling fluid)	50

Further technical data can be found in the catalog data sheet. The most recent version applies.

7 Assembly

7.1 Mechanical connection at the toolholder

WARNING

Warning: Risk of injury when the machine/system moves unexpectedly!
Remove the energy supplies before starting with assembly and adjustments.
Make sure that no residual energy remains in the system.

NOTICE

Severe damage at the shank of the module if it is used together with a shrink holder.

- Do not use a shrink holder.

Check the evenness of the bolting surface

The values relate to the entire bolting surface.

Requirements for levelness of the bolting surface (Dimensions in mm)

Diameter	Permissible unevenness
< 100	< 0.02
> 100	< 0.05

Mounting

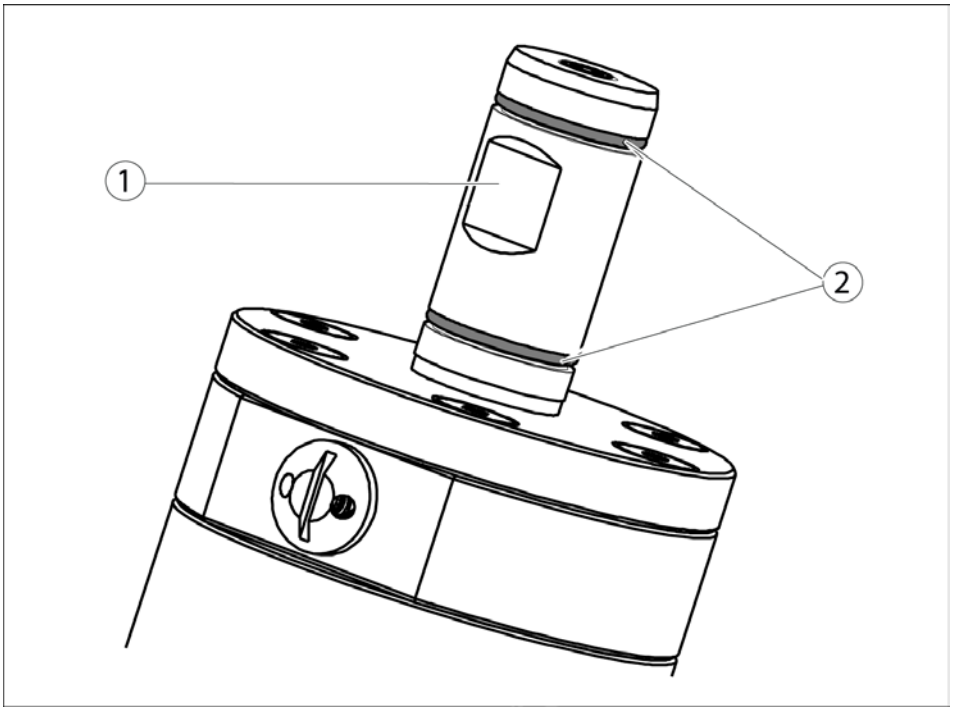

Fig. 1 Assembly options

1 Check whether the O-rings (2) are in use at the shank. If need be, put in the O-rings (2).

2 Clamp the module with the shank or via the clamping face (1) in the toolholder.

SCHUNK TENDO toolholder

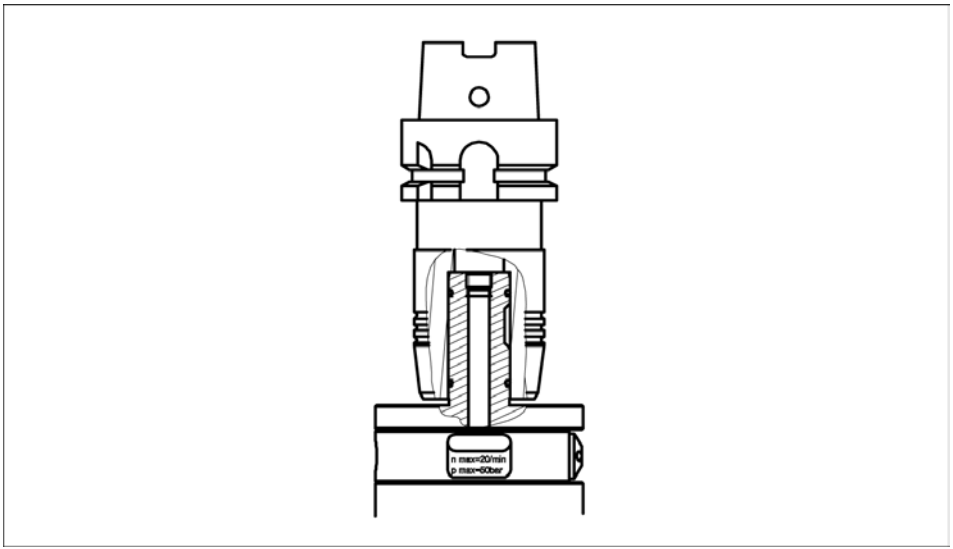

Fig. 2 Sectional view of the GSW-M clamped in the SCHUNK TENDO

The TENDO toolholder uses distributed clamping on the GSW-M shank (clamping principle: hydraulic expansion toolholder).

Toolholder with WELDON mount

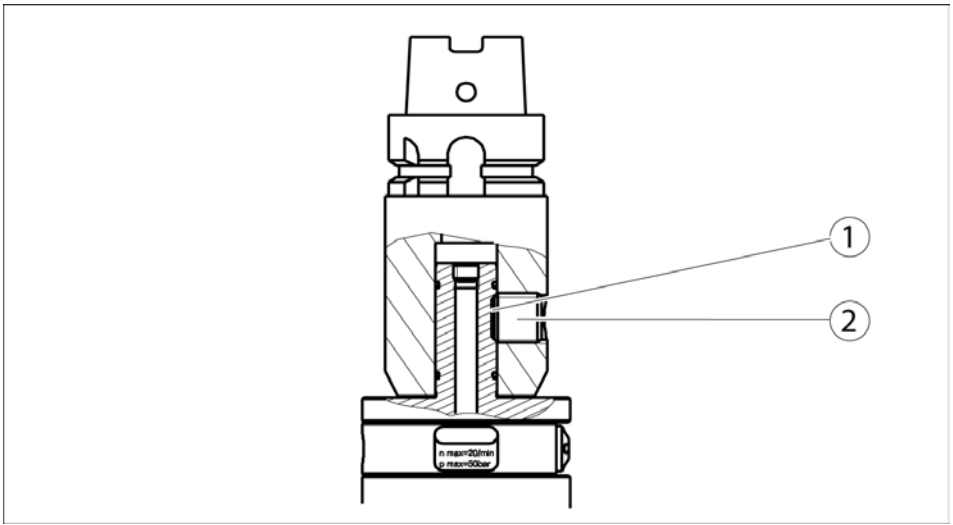

Fig. 3 GSW-M sectional view of GSW-M clamped in WELDON mount

The shank of the GSW-V is clamped in the clamping face (1) using the set screw (2) of the toolholder with WELDON mount.

7.2 Electricity, gas and water supply

	**⚠ WARNING** **Warning: Risk of injury when the machine/system moves unexpectedly!** Remove the energy supplies before starting with assembly and adjustments. Make sure that no residual energy remains in the system.

	***NOTICE*** Observe the requirements for the air supply. (☞ 6, Page 9) "Technical Data"

The pressure supply with compressed air or cooling lubricant is provided by the spindle.

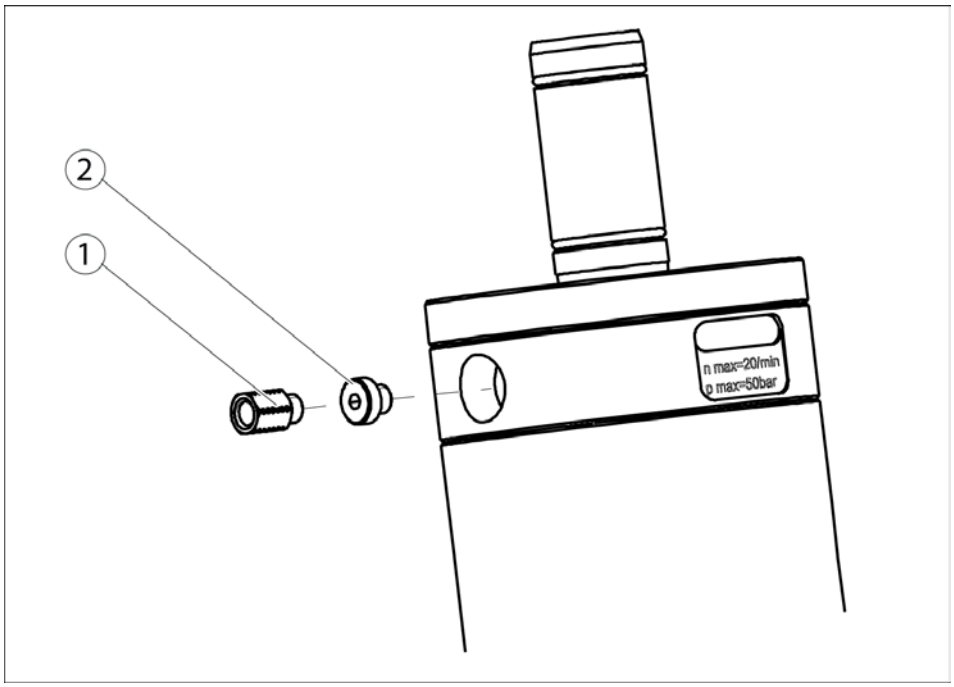

Fig. 4 Air connections

1 When using compressed air, the locking screw (2) has to be mounted on the unit.

2 When using the machine cooling fluid, the throttle (1) has to be mounted.

Further information on the hose-free direct connection contains the catalog data sheet.

8 Operation

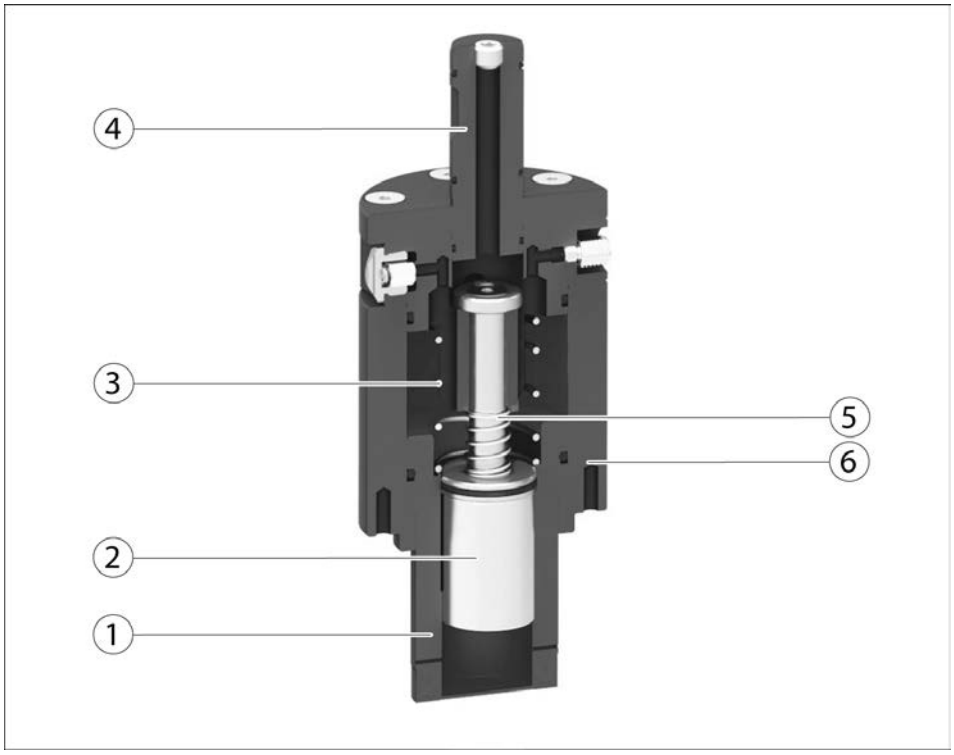

Fig. 5

1 The GSW-M is placed in the workpiece (1) with the wiper.

2 The GSW-M continues to lower in the direction of the workpiece (20 mm wiper) until the magnet (2) is on the base of the wiper (1). When this is done, the spring force (3) has to be overcome.
Recommendation: Already actuate the mount (4) with compressed air or cooling lubricant during the lowering of the GSW-M. This prevents the "starting up" of the workpiece when approaching the magnetic field.

3 To ensure secure contact of the magnet (2) on the workpiece, the GSW-M can be lowered by a maximum of another 9 mm as reserve stroke. When this is done, the spring force (5) also has to be overcome.

4 When picking up the workpiece, the wiper (1) moves again out of the housing (6) of the GSW-M by the reserve stroke.

5 When putting down the workpiece, the 9 mm reserve stroke can be used again.

6 After putting down the workpiece, compressed air or cooling lubricant will be actuated via the mount (4) of the GSW-M.

7 Due to the excess pressure in the interior of the GSW-M, the workpiece is held in a defined position via the wiper (1) an its

storage position and separated from the magnet (2) when picking up by the GSW-M.

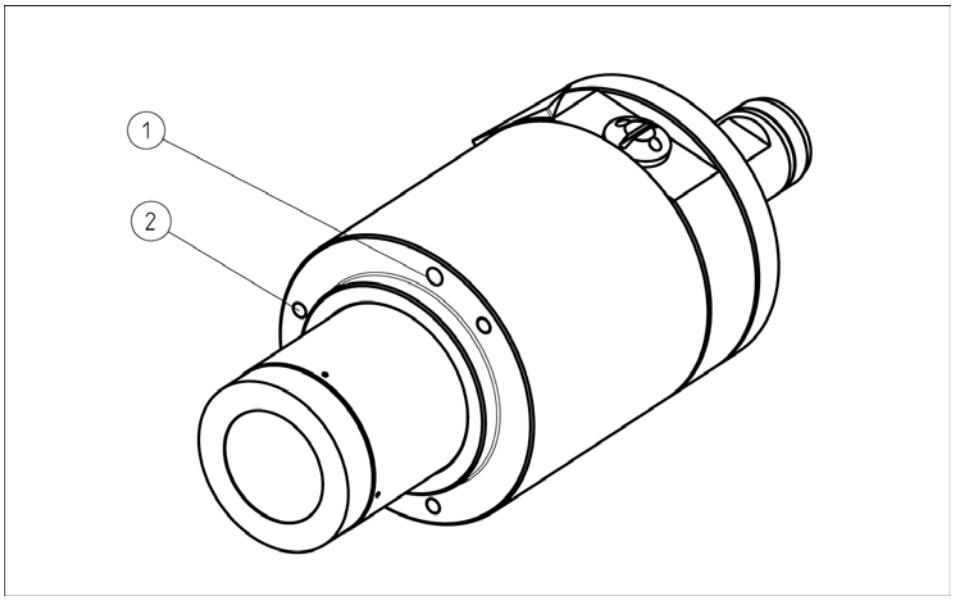

Fig. 6

NOTE
Using the fitting bores (1) and threads (2), auxiliary means (to mount the workpiece, for example) can be fastened.

9 Troubleshooting

9.1 Is the workpiece not put down?

Possible cause	Corrective action
Bore hole of the set-screw is clogged/dirty.	Check and, if need be, clean the bore hole. (☞ 10, Page 16)

9.2 Loss of workpiece?

Possible cause	Corrective action
Max. feed rate exceeded	Reduce the feed rate.
Recommended workpiece weight exceeded	Pay attention to the technical data (☞ 6, Page 9)

10 Maintenance and Care

10.1 Notes

- Regular visual inspection of the friction ring (11)
- If need be, clean the magnetic surface
- If need be, wearing part can be ordered or replaced (☞ 11, Page 18)

Original spare parts

When replacing damaged parts (wearing parts/spare parts) only use SCHUNK original spares.

10.2 Maintenance and lubrication intervals

NOTICE

At ambient temperature above 60°C the lubricants can harden faster.

- Interval decrease accordingly.

Size	20-D40
Interval [Mio. cycles]	2

10.3 Lubricants/Lubrication points (basic lubrication)

We recommend the lubricants listed.

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

Lubrication point	Lubricant
Metallic sliding surfaces	microGLEIT GP 360
All seals	Renolit HLT 2
Bores on the piston	Renolit HLT 2

10.4 Disassembly of the module

Position of the position numbers (☞ 11, Page 18)

1. Caution! The housing is under spring tension. Unscrew the screws (16) carefully. The spring force separates the housing (1) and the cover (2).
2. Pull the mount (6) off the cover (2).
3. Push the piston (3) out of the housing (1).
4. To dismantle the cover (2) and cylinder piston (4), unscrew the screw (15) and remove the washer (5).
   Caution! The cylinder piston is under spring tension.

10.5 Servicing and assembling the module

Maintenance

- Clean all parts thoroughly and check for damage and wear.
- Treat all greased areas with lubricant.
  (☞ 10.3, Page 16)
- Replace all wear parts / seals.
  - Position of the wearing parts (☞ 11, Page 18)
  - Sealing kit (☞ 12, Page 19)

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.(☞ 10.5.1, Page 17)

10.5.1 Screw tightening torques

Position of the position numbers (☞ 11, Page 18)

Item	GSW-M 20-D40
15	6 Nm
16	6 Nm

11 Assembly drawing

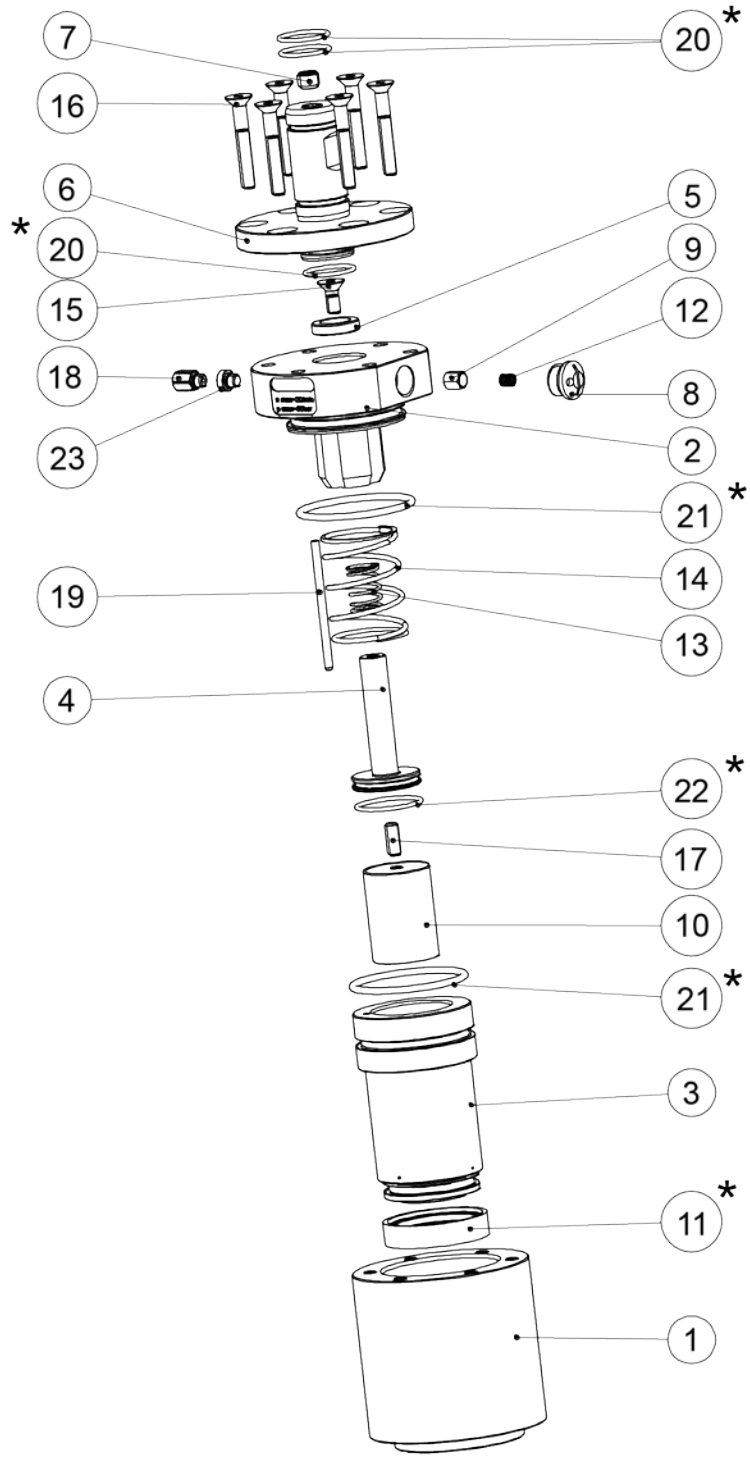

Fig. 7 Exploded view of the GSW-M

* Wearing part, replace during maintenance.
Included in the seal kit. Seal kit can only be ordered completely.

12 Seal kit

ID.-No. of the seal kit

Sealing kit for	ID number
GSW-M 20-D40	5522169

Contents of the seal kit (☞ 11, Page 18).

13 Translation of original declaration of incorporation

In terms of the EC Machinery Directive 2006/42/EG, Annex II, Part B

Manufacturer/ Distributor	SCHUNK GmbH & Co. KG Spann- und Greiftechnik Bahnhofstr. 106 – 134 D-74348 Lauffen/Neckar

We hereby declare that the following product:

Product designation:	Magnetic gripper with shank interface / GSW-M 20 / electro-pneumatic
ID number	0308355

meets the applicable basic requirements of the **Machinery Directive (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 12100:2011-03	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 62079:2001	Preparation of instructions - Structuring, content and presentation

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. Robert Leuthner, Address:
see address of the manufacturer

Lauffen/Neckar, September 2013 Ralf Winkler; Business Unit Manager R & D Mechanical Gripping Systems