

2-Finger-parallel gripper LGP 08 - 40

Assembly and Operating Manual



Imprint:

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Dear customer,

congratulation 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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Table of contents

1	About this manual	5
1.1	Warnings.....	5
1.1.1	Signal words	5
1.1.2	Symbole.....	5
1.2	Variants.....	6
1.3	Applicable documents	6
2	Basic safety notes	7
2.1	Intended use	7
2.2	Not intended use	7
2.3	Environmental and operating conditions.....	7
2.4	Product safety.....	8
2.4.1	Protective equipment	8
2.4.2	Demands on the top jaws	8
2.4.3	Constructional changes, attachments, or modifications.....	8
2.5	Personnel qualification.....	8
2.6	Using personal protective equipment.....	9
2.7	Notes on particular risks.....	9
2.7.1	Variant gripping force maintenance	10
3	Warranty	11
4	Scope of delivery	11
5	Accessories	11
5.1	Sensors.....	11
6	Technical data	12
7	Assembly	13
7.1	Mechanical connection	13
7.2	Air connection	14
7.3	Sensors.....	15
7.3.1	Programmable magnetic switch (MMS-P)	15
8	Troubleshooting	20
8.1	Modul does not move?	20
8.2	The module does not travel through the entire stroke?	20
8.3	Module opens or closes abruptly?	20
8.4	Magnetic switch does not work?	21
8.5	The gripping force drops?	21
8.6	Module does not achieve the opening and closing times?	21

9 Maintenance and Care 22

10 Translation of original declaration of incorporation..... 23

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 helps for an easier trouble shooting.

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

1.1 Warnings

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

1.1.1 Signal 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 Symbole



Warning about a danger point



Warning about hand injuries



General mandatory sign to prevent material damage

1.2 Variants

This operating manual applies for the following variations

- LGP without gripping force maintenance
- LGP with gripping force maintenance device "O.D. gripping"
- LGP with gripping force maintenance device "I.D. gripping"

1.3 Applicable documents

- General terms of business
- SCHUNK catalog gripping modules
- Assembly and Operating Manuals for sensors

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

2 Basic safety notes

2.1 Intended use

The module was designed to grip and to temporarily and securely hold workpieces and 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 12](#)).

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

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

2.3 Environmental and operating conditions

- Make sure that the module and the top jaws are a sufficient size for the application.
- Ensure that the environment is clean. Observe the maintenance and lubrication intervals. Link [Wartungs- und Schmierintervalle](#)
- Make sure that the environment is free from splash water and vapors as well as from abrasion or processing dust. This excludes modules that are designed specially for contaminated environments.

2.4 Product safety

Dangers arise from the module, if e.g.:

- 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 Demands on the top jaws

Arrange the top jaws such that when the module is depressurized it can reach one of the end positions either open or closed and therefore no residual energy can be released when changing the top jaws.

2.4.3 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 7](#)). This applies particularly to personnel only used occasionally, such as maintenance personnel.

2.6 Using personal protective equipment



When using this product, observe the relevant industrial safety regulations and use the personal protective equipment (PPE) required!



- Use protective gloves, safety shoes and safety goggles.
- Observe safe distances.
- Minimal safety requirements for the use of equipment.



2.7 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 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 due to squeezing and bumping during movement of the gripper jaws and breaking or loosening of the gripper fingers !

	 WARNING
	Risk of injury from objects falling and being ejected <ul style="list-style-type: none">• The danger zone must be surrounded by a safety fence during operation.

	 WARNING
	While disassembling uncontrollable moves of parts of the gripper possible!

2.7.1 Variant gripping force maintenance

	 WARNING
	Risk of injury from objects falling during energy supply failure <p>Modules with a mechanical gripping force maintenance can, during energy supply failure, still move independently in the direction specified by the mechanical gripping force maintenance.</p> <ul style="list-style-type: none">• Secure the end positions of the module with SCHUNK SDV-P pressure maintenance valves.

3 Warranty

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

- Appropriate use in 1-shift operation
- Observance of the ambient conditions and operating conditions

Parts touching the workpiece and wearing parts are not part of the warranty. Also observe our general terms of business.

4 Scope of delivery


The scope of delivery includes:

- 2-Finger-parallel gripper LGP in the ordered model.
- Accessory kit

5 Accessories

The following accessories that are required for the module must be ordered separately:


- Sensors

To get information about which accessories can be used with the appropriate product variant,  catalog.

5.1 Sensors

Overview of the compatible sensors

Designation	Type
Programmable magnetic switch	MMS-P

- Exact type designation of the compatible sensors see  catalog
- If you require further information on sensor operation, contact your SCHUNK contact person or download information from our homepage.

6 Technical data

size	08	10	16	20	25	40
Stroke per jaw [mm]	2	3	5	6	8	13
Weight [kg]						
without gripping force maintenance	0.03	0.07	0.15	0.24	0.46	1.5
with gripping force maintenance device	0.04	0.08	0.16	0.25	0.48	1.6
Recommended workpiece weight [kg]	0.13	0.29	0.6	1.2	1.9	4.2
Max. permissible finger length [mm]	20	25	32	40	50	64
Max. permitted weight per finger [kg]	0.03	0.04	0.06	0.09	0.12	0.3
ambient temperature [°C]	-10 90					
ambient temperature min. [°C]						
ambient temperature max. [°C]						
Min. spring force [N]						
without gripping force maintenance	-	-	-	-	-	-
with gripping force maintenance device AS	6	16	20	40	80	250
with gripping force maintenance device IS	6	16	20	40	80	250
Closing force [N]						
without gripping force maintenance	26	58	120	240	380	840
with gripping force maintenance device AS	32	74	140	280	460	1090
with gripping force maintenance device IS	-	-	-	-	-	-
Opening force [N]						
without gripping force maintenance	36	70	138	280	438	928
with gripping force maintenance device AS	-	-	-	-	-	-
with gripping force maintenance device IS	42	86	158	320	518	1178
IP rating	40					
Pressure medium	compressed air, standard for quality of the compressed air according to ISO 8573-1: 6 4 4					
Min. pressure [bar]	2 4					
without gripping force maintenance						
with gripping force maintenance device						
Max. pressure [bar]	8 6.5					
without gripping force maintenance						
with gripping force maintenance device						

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

7 Assembly

7.1 Mechanical connection

Check the evenness of the bolting surface The values relate to the entire bolting surface.

Requirements for levelness of the bolting surface

Diameter [mm]	Permissible unevenness [mm]
< 100	< 0.02
> 100	< 0.05

Mounting The module can be mounted from the rear or on the side:

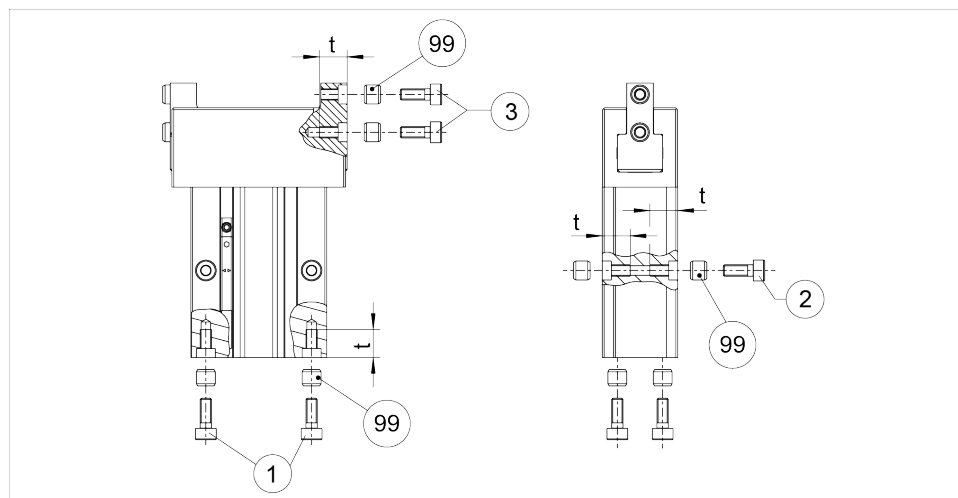


Fig. 1 Assembly options

Maximal screw-in depth of the fastening screws provided by the customer.


mounting material (provided by customer)


Item	Mounting	08	10	16	20	25	40
1	Module rear mounting	M3 / 7.4 deep			M4 / 10 deep	M5 / 13 deep	M8 / 16 deep
2	Module side mounting	M3	M3 / 7.4 deep		M4 / 10 deep	M5 / 11 deep	M8 / 16 deep
3	top jaws	M3 / 5deep	M3 / 7.4 deep		M4 / 10 deep	M5 / 11 deep	M8 / 16 deep
99	centering sleeve	Ø5h6 / 4.35 deep			Ø6h6 / 5.35 deep	Ø8h6 / 5.35 deep	Ø12h6 / 6.65 deep

NOTE

- When mounting from rear or on the side, mount the module using the centering sleeves (99) provided.
- Mount the module using the mounting bores.
- Mount the top jaws using the mounting bores provided.

7.2 Air connection

	NOTICE
	<p>The maximum permissible mass per jaw is exceeded:</p> <ul style="list-style-type: none"> • Attach flow control couplings to the module.

	NOTICE
	<p>Observe the requirements for the air supply. (↩ 6, Page 12) "Technical data"</p>

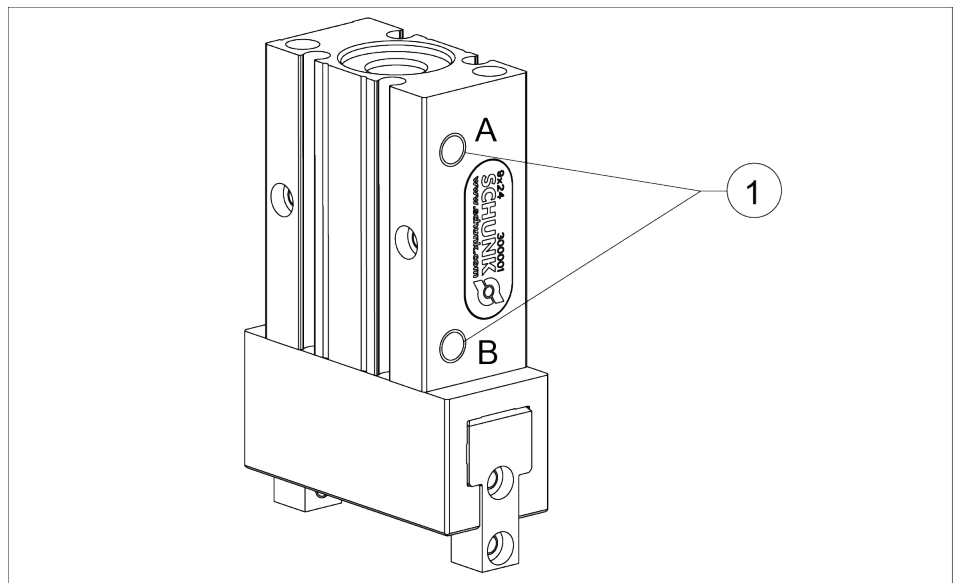


Fig. 2 Air connection

thread diameter of the air connections

Item	connection	08	10	16	20	25	40
1	thread diameter of the air connections (A = open, B = closed)	2 x M3		2 x M5		2 x G1/8"	

7.3 Sensors

The gripper is ready to be used with the MMS-P sensors.

- If you require further information on sensor operation, contact your SCHUNK contact person or download information from our homepage.
- Technical data of the sensors can be found in the data sheets (included in the scope of delivery).

7.3.1 Programmable magnetic switch (MMS-P)

NOTE

The MMS-P can be used only for sizes LPG 08 – LPG 40

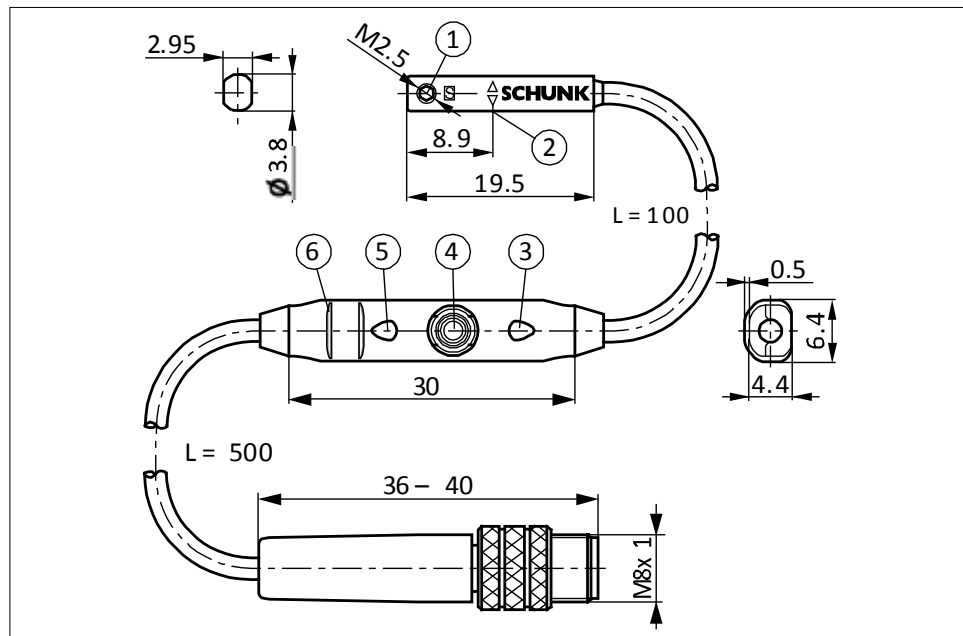


Fig. 3 Magnetic switch (MMS-P 22)

1	mounting screw	4	Teach-button
2	center sensor elements	5	LED display
3	LED display	6	Rips for cable tires

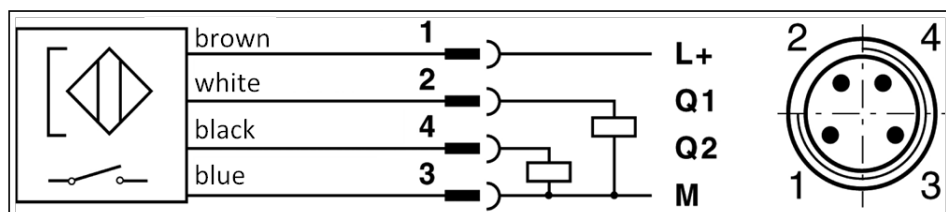


Fig. 4 Connection diagram PNP-4 conductor (MMS-P 22)


Types available for order (see catalog):

- MMS-P 22-S-M8-PNP
- MMSK-P 22-S-PNP
- V2-M8-4-2XM8-3

The MMSK-P 22-S-PNP features a cable with open strands so that it can be connected by means of terminal contacts.

The V2-M8-4-2XM8-3 distributor is used to convert the 4-pin connector plug of the MMS-P 22-S-M8-PNP sensor to two standard M8 plugs with 3 pins each.

Mounting of the sensor

	NOTICE
	<p>Sensor can be damaged during assembly.</p> <ul style="list-style-type: none"> • Do not exceed the maximum tightening torque of 10 Ncm for the set screws.

NOTE

Ferromagnetic material changes the switching positions of the sensor. For example: Adapter plate made of ordinary steel.

At ferromagnetic adapter plates:

- The module must firstly be mounted on the adapter plate
- Then, the positions of the magnetic switch have to be set

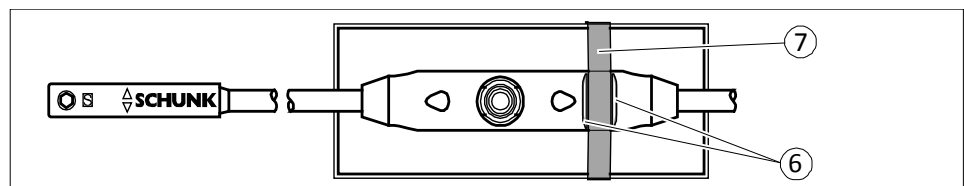


Fig. 5

- 1 To relieve the cable, the electronics have to be fixed in place using cable ties (7).
There are ribs (6) in place on the electronics for mounting purposes.

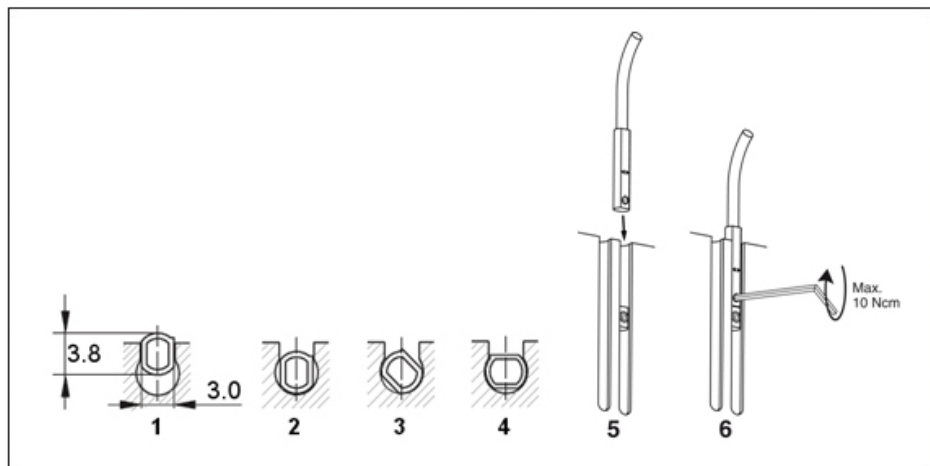


Fig. 6

- 2 Turn in the sensor (1 - 4).
OR
Push the sensor axially into the slot until it contacts the stop (5).
- 3 Fix the sensor with an Allen wrench (6).

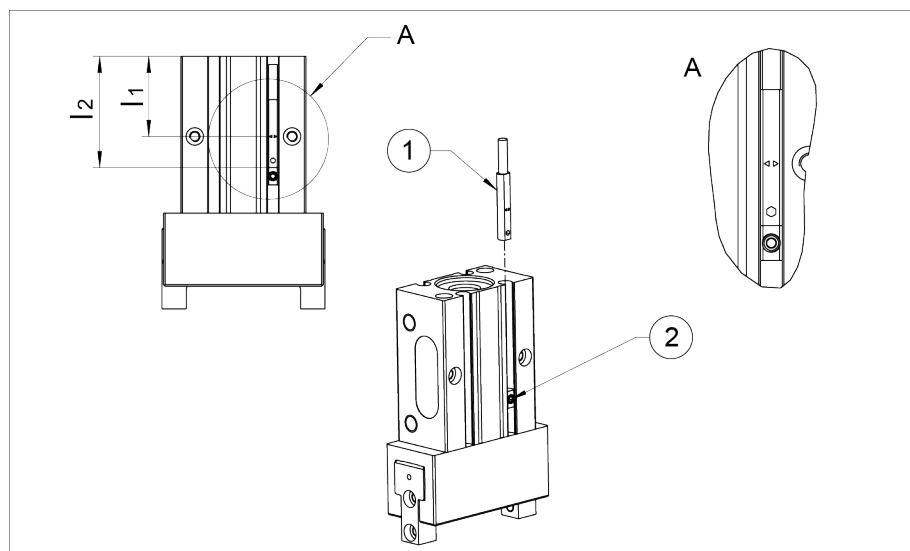


Fig. 7:

If there is no terminal stop, then slide the magnetic switch according to dimension I₂ (bottom edge of gripper up to front side of sensor) or according to dimension I₁ (bottom edge of gripper up to double arrow on sensor) and then clamp.

Type	Maß I ₁ [mm]	Maß I ₂ [mm]	Type	Maß I ₁ [mm]	Maß I ₂ [mm]
LGP 08	15.2	24.1	LGP 20-AS	20.6	29.5
LGP 08-AS	10.1	19.0	LGP 20-IS	25.6	34.5
LGP 08-IS	18.4	27.3	LGP 25	33.6	42.5
LGP 10	18.4	27.3	LGP 25-AS	25.6	34.5

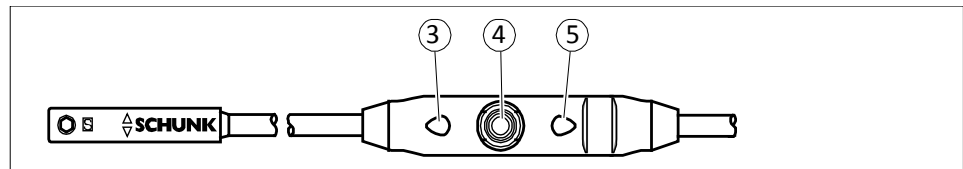
Type	Maß l ₁ [mm]	Maß l ₂ [mm]	Type	Maß l ₁ [mm]	Maß l ₂ [mm]
LGP 10-AS	15.9	24.8	LGP 25-IS	33.6	42.5
LGP 10-IS	18.4	27.3	LGP 40	45.3	54.2
LGP 16	23.0	31.9	LGP 40-AS	29.3	38.2
LGP 16-AS	19.0	27.9	LGP 40-IS	45.3	54.2
LGP 16-IS	23.0	31.9			
LGP 20	25.6	34.5			

Setting up the switching points

- 1 Keep the Teach-Button (4) pressed for 2 seconds.
⇒ After 2 seconds LED 1 (3) is flashing.
 - 2 Move the gripper into position 1 (e.g. "open").
 - 3 Press the Teach-Button (4) briefly.
⇒ LED 1 (3) lights up and LED 2 (5) is flashing.
 - 4 Move the gripper into position 2. (e.g. „-2mm“).
⇒ LED 1 (3) should turn out as soon as the switching point 1 is left.
 - 5 Press the Teach-Button (4) briefly.
⇒ LED 2 (5) lights up.
- ⇒ The switching points are set.

Adjusting the hysteresis

The hysteresis to both switching points will be adjusted automatically corresponding to the characteristics of the magnetic field. The user can set the switching and triggering points of each position a little bit closer than for the automatic mode. The triggering point is closer to the switching point. At the same time the susceptibility to trouble and damage increases. In the mode of the lowest hysteresis, an error signal (such as jitter or untimely switch off) can be avoided, if the sensor is protected against all types of disturbances (i.e. by shielding). Frequent types of disturbances are change in temperature and electro-magnetic influences. Within the closest fine-teach mode, SCHUNK cannot guarantee EMC-compatibility any more. The hysteresis adjustment is used for the manual adjustment of the switching points (if necessary). In case that the hysteresis automatically determined by the sensor should be too high or too low after “the adjustment of the switching points”, you may correct the value as follows. The sensor avoids a too small hysteresis during hysteresis adjustment. The lowest securely detectable difference in stroke is ≤10 % of the nominal stroke.



- 1 Press the Teach-Button (4) for 5 seconds.
 - ⇒ LED 1 (3) will flash up after 2 seconds
 - ⇒ LED 1 will stop after 5 seconds.
 - 2 Release the Teach-Button.
 - 3 Put the gripper to position „switch-off point of switching point 1”.
 - 4 Press the Teach-Button (4) briefly. LED 1(3) will light up twice.
 - 5 Put the gripper to position „switch-off point of switching point 2”.
 - 6 Press the Teach-Button (4) briefly.
 - ⇒ LED 2 (5) will light up twice.
- ⇒ The Mounting of the sensor MMS-P is completed.

8 Troubleshooting

8.1 Modul does not move?

Possible cause	Corrective action
Base jaws jam in housing, possible cause: bolting surface not sufficiently level.	Check the levelness of the bolting surface. (☞ 7.1, Page 13) Loosen the mounting screws for the gripper and actuate the gripper again.
Pressure drops below minimum.	Check the air supply. (☞ 7.2, Page 14)
Compressed air lines switched	Check compressed air lines.
Proximity switch defective or set incorrect.	Repair the proximity switch.
Unused air connections not closed.	Close the unused air connections.
Choke valve closed.	Open the choke valve.
Component is broken, e.g. through overloading	Replace the module.

8.2 The module does not travel through the entire stroke?

Possible cause	Corrective action
Pressure drops below minimum.	Check the air supply. (☞ 7.2, Page 14)
Mounting surface is not even enough	Check the levelness of the bolting surface. (☞ 7.1, Page 13)
Component is broken, e.g. through overloading	Replace the module.

8.3 Module opens or closes abruptly?

Possible cause	Corrective action
Compressed air lines are blocked	Check the compressed air lines for crushing or damage.
Mounting surface is not even enough	Check the levelness of the bolting surface.
Throttle check valve is missing or not set correctly	Install and adjust throttle check valve
Load too high	Review permissible weight and length of the jaws (☞ 7.1, Page 13)

8.4 Magnetic switch does not work?

Possible cause	Corrective action
Use steel screws to mount the gripper	Use VA-screws
Mounting plates, brackets, etc. from non magnetic materials	If possible, use aluminium or plastic

8.5 The gripping force drops?

Possible cause	Corrective action
Compressed air can escape	Check seals; if necessary, dismantle module
Pressure drops below minimum.	Check the air supply. (👉 7.2, Page 14)

8.6 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 module to the maximum that the movement of the jaws occurs without bouncing and hitting.</p> <p>NOTICE! The one way flow control valves must not be removed even when the gripper has reached the opening and closing times.</p> <p>Check compressed air lines.</p> <p>Inner diameter of the compressed air lines are sufficiently large relative to the compressed air consumption</p> <p>Compressed air lines between module and control valve should be kept as short as possible</p> <p>Flow rate of valve is sufficiently large relative to the compressed air consumption</p>
Load too high	Review permissible weight and length of the jaws

9 Maintenance and Care

The parallel gripper LGP is not intended for maintenance.
Disassembly for maintenance or repair purposes is not possible.
A damaged gripper has to be replaced completely.

