Comparison of grippers for small parts
SCHUNK MPG-plus | GIMATIC SGP-S

PL pneumatic gripping
Product managment

Superior Clamping and Gripping

SCHUNK

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Preface

The shown comparison of the SGP-S series from GIMATIC with the small part gripper MPG-plus from SCHUNK is a neutral comparison of products made by the SCHUNK development based on facts and measurments. The company GIMATIC nor the SGP-S series is rated.

Sources of the technical data and pictures from GIMATIC:

- Catalog data sheets, from 01/2020
- Website GIMATIC, from 01/2020

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Initial situation

The SGP-S series has four sizes which are comparable or even identical to the MPG+ construction sizes 20 / 25 / 32 /40.

2-jaw parallel self-centering pneumatic gripper (series SGP-S)

- *Double acting.*
- *Exclusive backlash adjusting system.*
- *High performance in small dimensions.*
- *The rugged construction lends itself to heavy duty applications for a trouble free long life without maintenance.*
- *Various fastening and air feeding options.*
- *Ready for PRO-SN (1) programmable magnetic sensor.*
- *Food grade grease FDA-H1.*

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Portfolio comparison – variants and options

size	10	12	16	20	25	32	40	50	64
SCHUNK MPG-plus (max. 90°C)	✓	✓	✓	✓	✓	✓	✓	✓	✓
AS - Version (gripping force maintenance -closing)	X	X	✓	✓	✓	✓	✓	✓	✓
IS - Version (gripping force maintenance-opening)	X	X	✓	✓	✓	✓	✓	✓	✓
V – Version (max. 100°C instead of 90°C)	X	X	✓	✓	✓	✓	✓	✓	✓
precision version	X	X	✓*	✓*	✓	✓	✓	✓	✓*
size	**10**	**12**	**16**	**20**	**25**	**32**	**40**	**50**	**64**
Gimatic SGP-S (max. 60°C)	X	X	X	✓	✓	✓	✓	X	X
AS - Version (gripping force maintenance -closing)	X	X	X	X	X	X	X	X	X
IS - Version (gripping force maintenance -opening)	X	X	X	X	X	X	X	X	X
V – Version (max. 100°Cinstead of 90°C)	X	X	X	X	X	X	X	X	X
precision version	X	X	X	X	X	X	X	X	X

✓ = available (from the catalogue) X = not available (not in the catalogue) * = in progress

Portfolio comparison – sensors

size – SCHUNK MPG-plus		10	12	16	20	25	32	40	50	64
magnetic sensors	MMS 22-PI2 (two programmable positions)	X	X	X	X	✓	✓	✓	✓	✓
	MMS-P (two programmable positions)	X	X	X	X	✓	✓	✓	✓	✓
	MMS-A (analogue signal for the full stroke)	X	X	X	X	✓	✓	✓	✓	✓
	MMS-IO-Link (IO-Link)	X	X	X	X	✓	✓	✓	✓	✓
	FPS (up to five digital positions)	X	X	X	✓	✓	✓	✓	✓	✓
inductive sensors	IN 30 (Ø 3mm)	✓	✓	✓	X	X	X	X	X	X
	IN 40 (Ø 4mm)	X	X	X	✓	✓	✓	✓	✓	✓
	IN 5 (5mm quadratic cross-section)	X	X	X	X	✓	✓	✓	✓	✓

size – Gimatic SGP-S	10	12	16	20	25	32	40	50	64
PRO-SN (three positions with one magnetic sensor)	X	X	X	✓	✓	✓	✓	X	X
inductive sensor	X	X	X	✓	✓	✓	✓	X	X

✓ = compatible (maybe mounting kit necessary) X = not compatible

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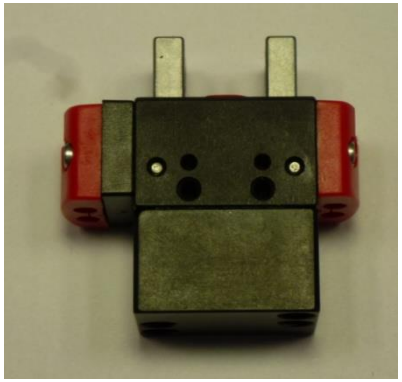
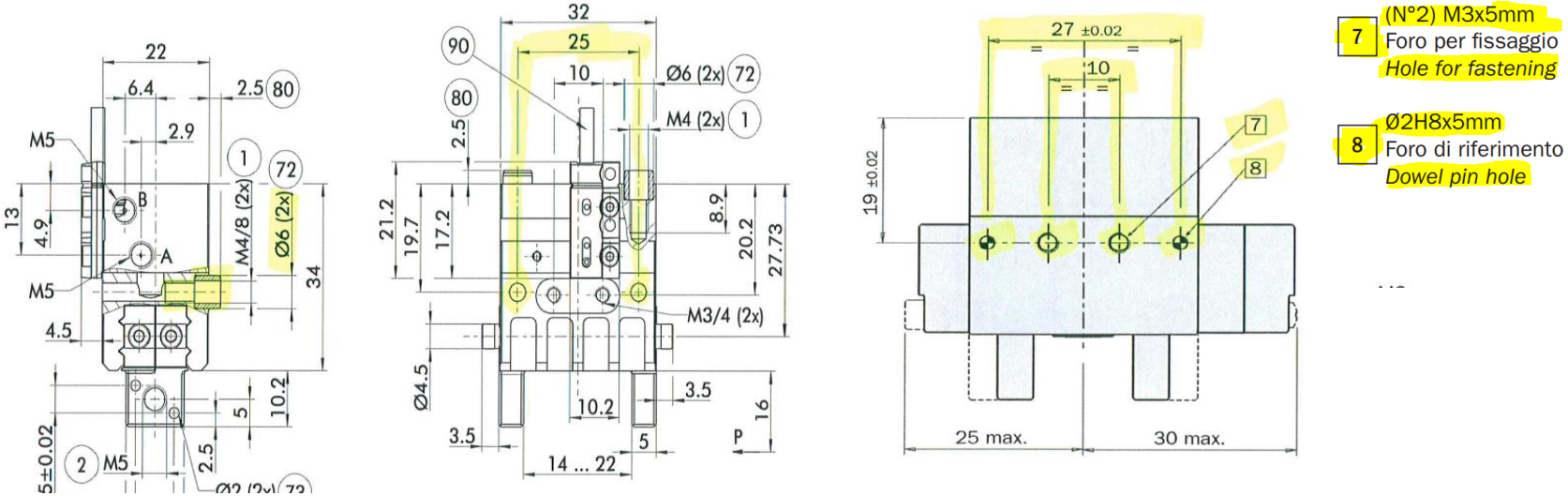
Exchangeability to SCHUNK



Gripper mounting:

- Mounting on bottom side is identical.
- Sidewise mounting is completely different to the sidewise mounting of the MPG-plus series.

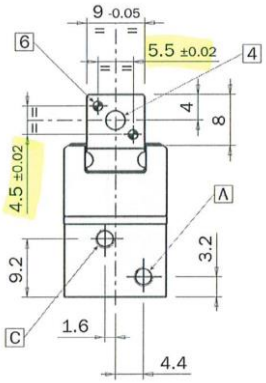


Exchangeability to SCHUNK

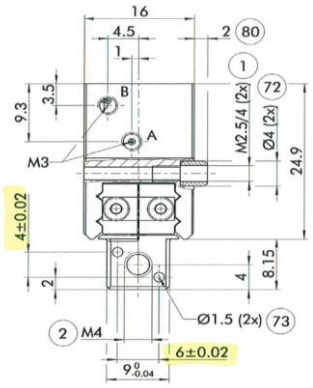
finger mounting:

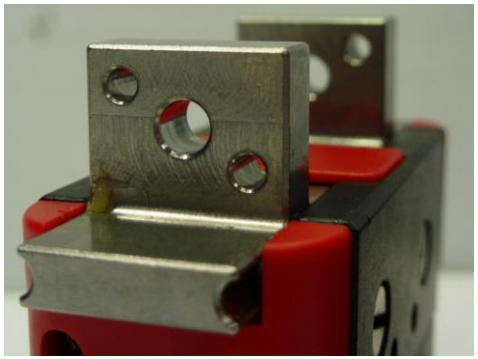
- Size 20, different drilling pattern
- Sizes 25, 32 and 40 have identical dimensions

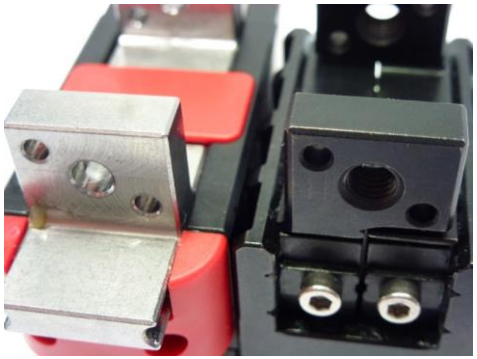
SGP-S 20



MPG-plus 20



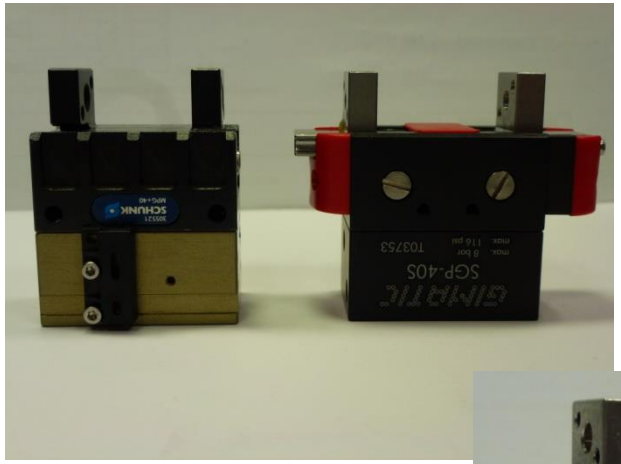




- GIMATIC has switched over to the proven threads of the MPG-plus.

Exchangeability to SCHUNK

The external dimensions are slightly different. The SGP-S series is wider with its plastic caps than the SCHUNK gripper.



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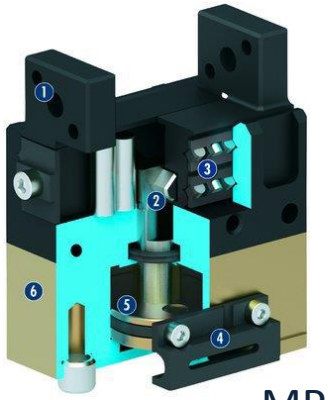
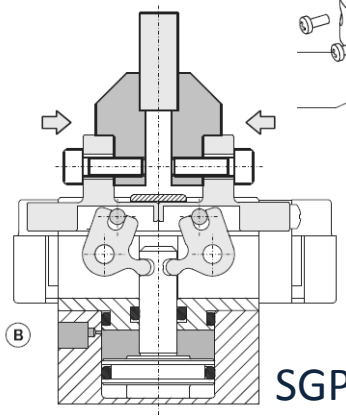
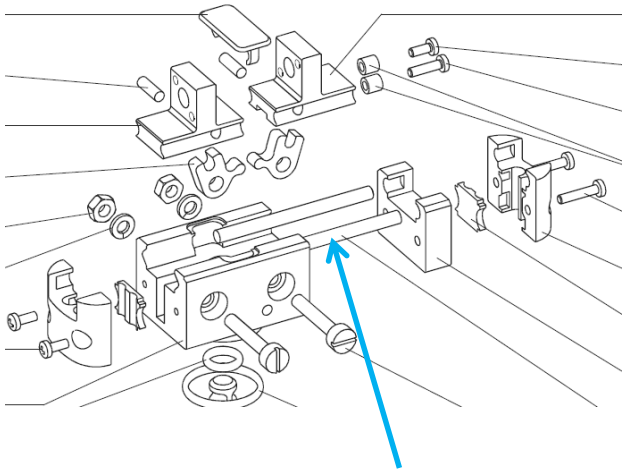
Kinematic and guidance



MPG-plus



SGP-S



guidance pin

	SCHUNK MPG-plus	GIMATIC SGP-S
Kinematic	The MPG-plus series is based on the wedge hook principle -> power transmission over surfaces	The SGP-S series works with lever arms which manage the stroke movement -> more parts -> power transmission over lines
Guidance	The fingers are guided by cross rolls. -> smooth running, scope-free rolling guidance	The fingers are guided by pins -> sliding guidance with a bit of a free play

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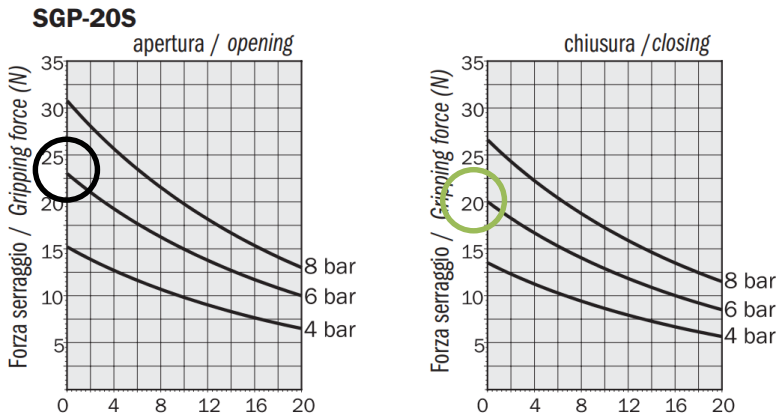
Technical values

A direct comparison of the gripping forces from the technical data sheets can not be made because GIMATIC defines the gripping force at 0 mm finger length.

Whereas SCHUNK defines the gripping force at a realistic finger length at point P.

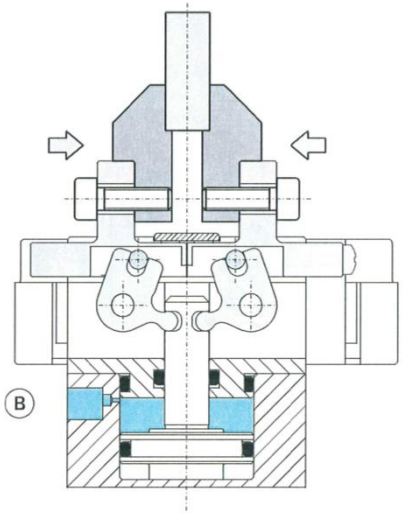
The gripping forces of the GIMATIC grippers are obtained from the diagrams in the following pages.

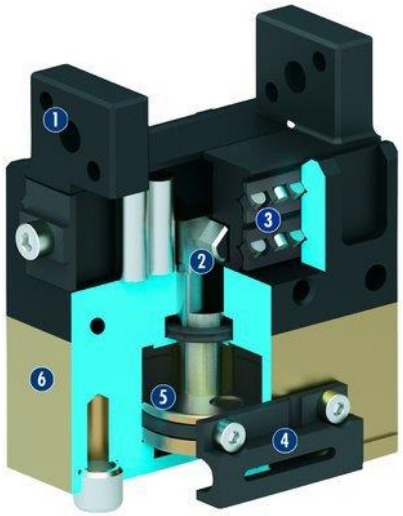
	SGP-20S
Fluido *Medium*	
Pressione di esercizio *Operating pressure range*	
Temperatura di esercizio *Operating temperature range*	
Forza di serraggio per griffa in apertura a 6 bar *Opening gripping force at 6 bar on each jaw*	23 N
Forza di serraggio totale in apertura a 6 bar *Opening total gripping force at 6 bar*	46 N
Forza di serraggio per griffa in chiusura a 6 bar *Closing gripping force at 6 bar on each jaw*	20 N
Forza di serraggio totale in chiusura a 6 bar *Closing total gripping force at 6 bar*	40 N



Technical values

- At GIMATIC the opening force is higher than the closing force
- At SCHUNK the closing force is higher than the opening force
- Due to lever kinematic (GIMATIC) the gripping force is not the same throughout the entire stroke. At little strokes this problem is insignificant. In case of wedge hook kinematics (SCHUNK) the gripping force is the same throughout the entire stroke.





Technical values – size 20 / 25

	SGP-20S	MPG-plus 20 P=10 mm	SGP-25S	MPG-plus 25 P=14 mm
Gripping force point P closing- / opening force [N]	26/30 *	34/30	60/68*	38/32
max. permissible finger length [mm]	20	25	30	32
max. permissible mass per finger [g]	5	10	15	20

* Gripping force obtained from diagram

Technical values – size 32 / 40

	SGP-32S	MPG-plus 32 P=16 mm	SGP-40S	MPG-plus 40 P=20 mm
Gripping force point P closing- / opening force [N]	84/116*	80/70	108/120*	135/110
max. permissible finger length [mm]	50	40	70	50
max. permissible mass per finger [g]	20	40	40	80

* Gripping force obtained from diagram

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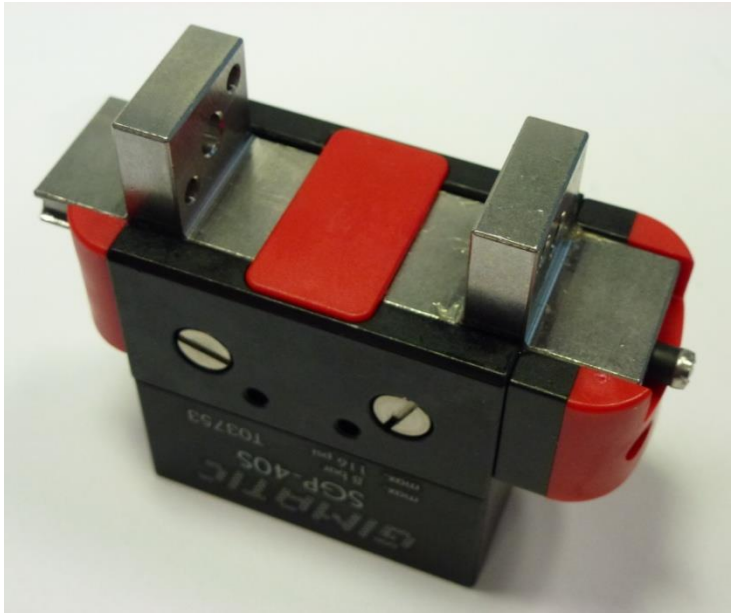
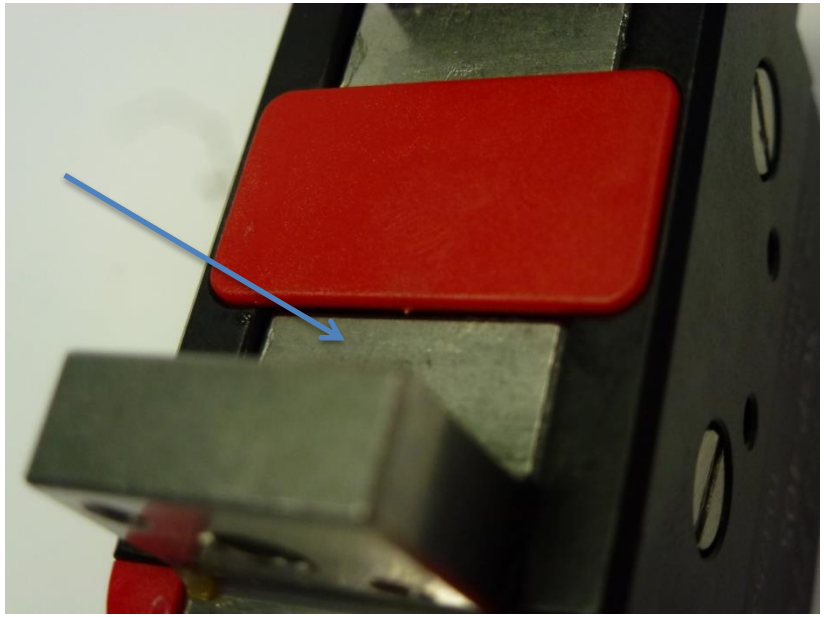
Anomalies of the samples

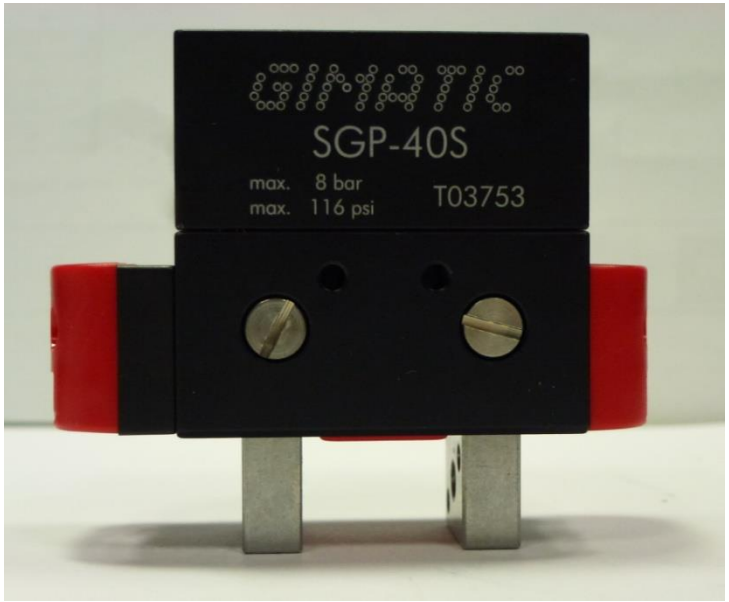
- Base jaws are milled just like the MPG-plus but not coated
- The cover of the jaws is very tight. Some of the samples had a gap between the cover and the finger (dirt can easily get through)





Anomalies of the samples

There are no other major anomalies found. The grippers give a proper impression.



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Check by technical laboratory

All grippers were measured parallel to the MPG-plus series before the endurance test with the following results.

Tightness

- No anomalies during the leakage and minimum pressure test.

stroke

- The SGP-S series just reaches the stroke given in the catalogue. Some grippers barely reach the stroke given in the catalogue. So there are no reserves to the values given in the catalogue.
- The MPG-plus has an average stroke of 0.8 mm more than specified in the catalogue.

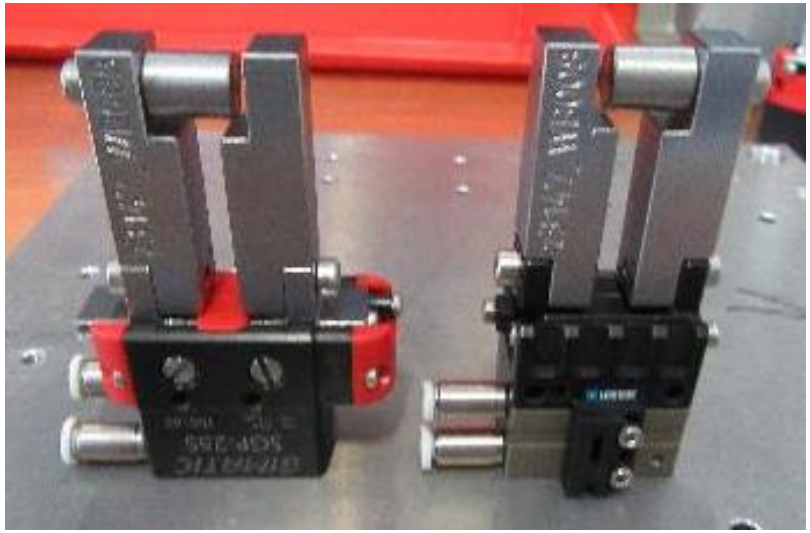
play in the guidance

- The SGP-S series has more play in the guidance than the MPG-plus. The reason for this is the sliding guidance.

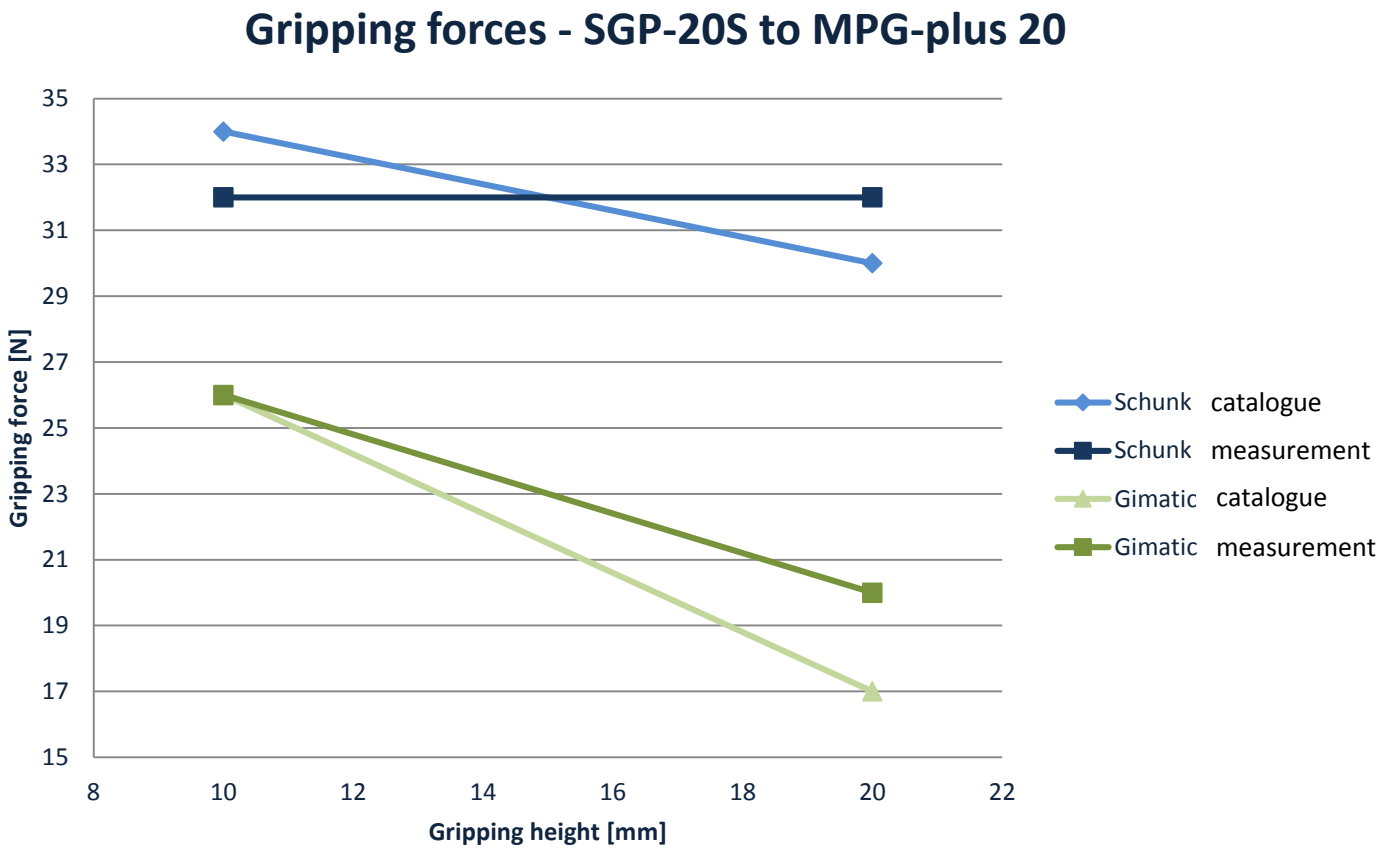
Check by technical laboratory

Gripping force

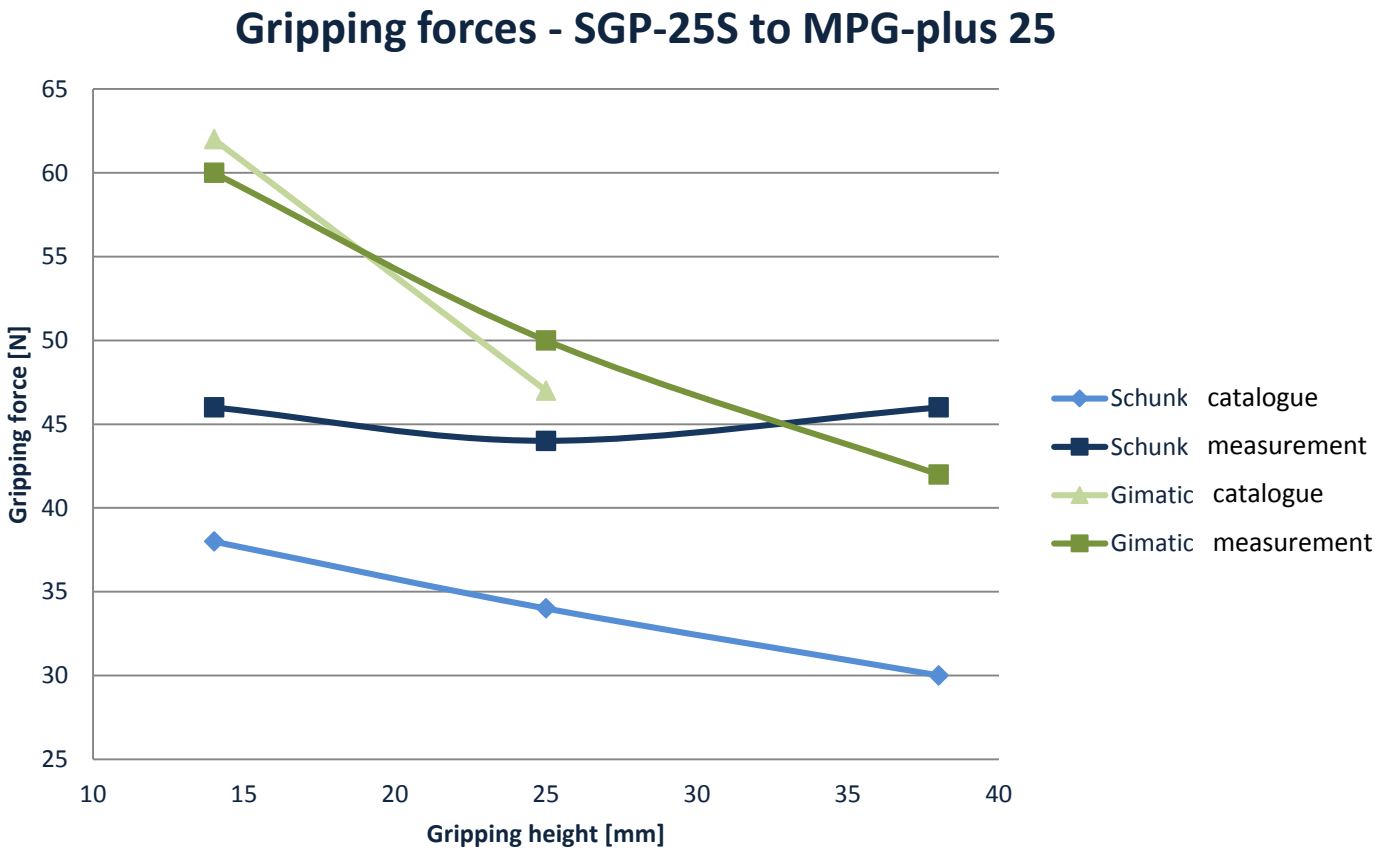
- Similar to the stroke measurements. Little or no reserve to the specification given in the catalogue.
- When the finger length is rising, the gripping force of the SGP-S is decreasing. Therefore the MPG-plus has more gripping force at maximum finger length compared to the SGP-S even when the catalogue specifications are not as good as the ones from the SGP-S. (See following diagrams).



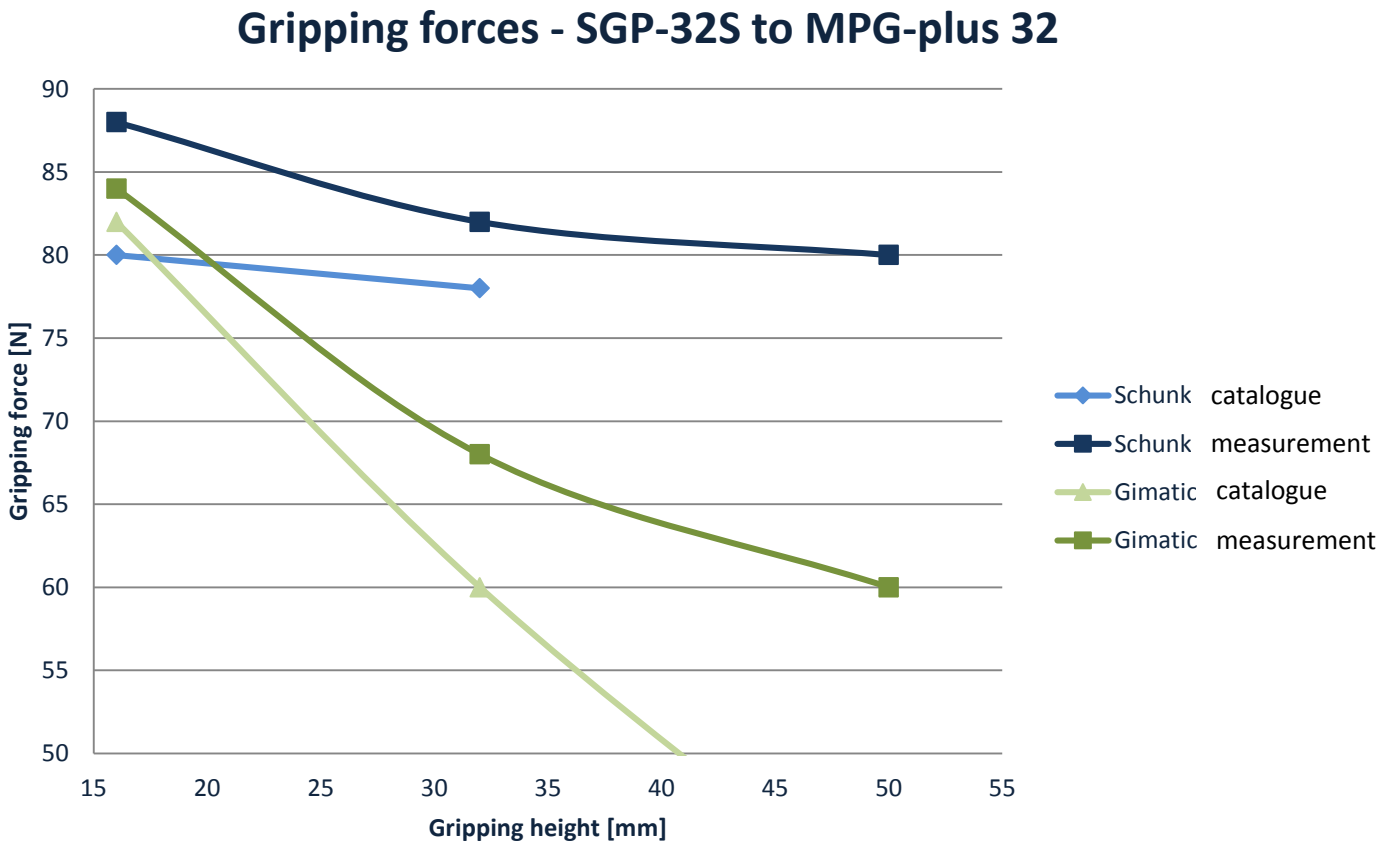
Check by technical laboratory



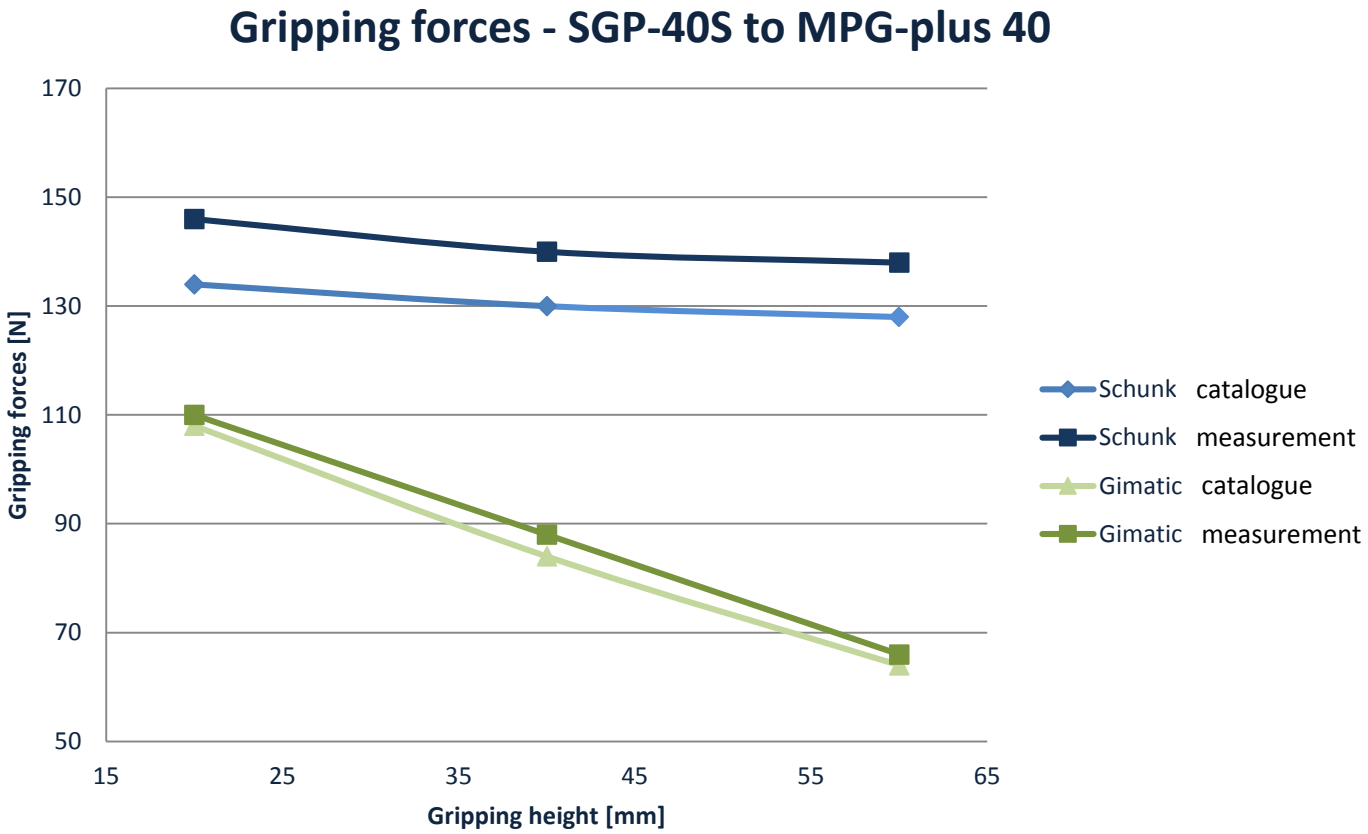
Check by technical laboratory



Check by technical laboratory



Check by technical laboratory



Check by technical laboratory

After inspection, the grippers (one gripper per size) were tested in endurance tests. The endurance run was designed for the finger length and the finger weight of the Gimatic grippers.

The endurance runs confirmed the first impression after the inspection:

- Several grippers did not reach the stroke given in the catalogue
- The grippers did not achieve the advertised gripping force, even after the „run-in“
- The play of the guidance increases with the number of cycles due to the fact that the sliding guidance does not have a perfect fitting to the surface

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