# SGP-S

## *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.*
- *Prepared for adjustable inductive sensors.*
- *Food grade grease FDA-H1.*


**SGP-20S**


**SGP-25S**


**SGP-32S**

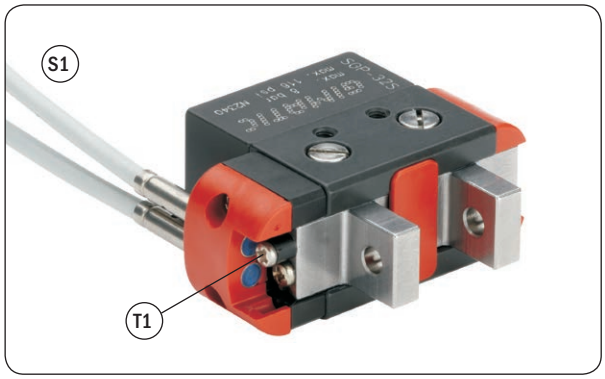

**SGP-40S**

| | SGP-20S | SGP-25S | SGP-32S | SGP-40S |
|---|---|---|---|---|
| *Medium* | *Filtered, lubricated / non lubricated compressed air* | | | |
| *Operating pressure range* | 2 ÷ 8 bar | | | |
| *Operating temperature range* | 5° ÷ 60°C. | | | |
| *Opening gripping force at 6 bar on each jaw* | 23 N | 52 N | 67 N | 80 N |
| *Opening total gripping force at 6 bar* | 46 N | 104 N | 134 N | 160 N |
| *Closing gripping force at 6 bar on each jaw* | 20 N | 47 N | 60 N | 73 N |
| *Closing total gripping force at 6 bar* | 40 N | 94 N | 120 N | 146 N |
| *Total stroke* (±0.3 mm) | 4 mm | 6 mm | 8 mm | 12 mm |
| *Maximum working frequency* | 3 Hz | 3 Hz | 3 Hz | 3 Hz |
| *Cycle air consumption* | 0.5 $cm^3$ | 1.4 $cm^3$ | 2.4 $cm^3$ | 4.5 $cm^3$ |
| *Closing time without load* | 0.01 s | 0.01 s | 0.02 s | 0.05 s |
| *Repetition accuracy* | 0.02 mm | 0.02 mm | 0.02 mm | 0.02 mm |
| *Weight* | 33 g | 43 g | 86 g | 170 g |

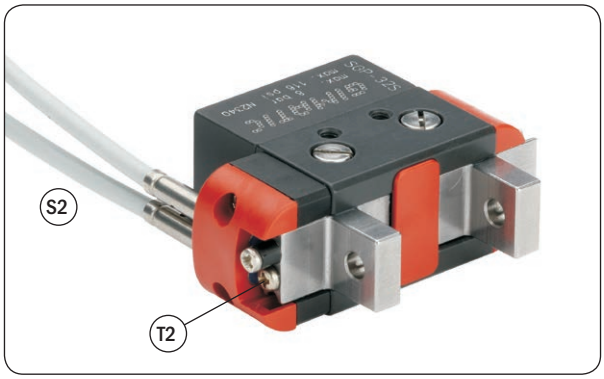
### *Sensors*

*The operating position can be checked by two inductive sensors S1 and S2 (not supplied), detecting the position of the screw heads T1 and T2 placed on the right jaw.*

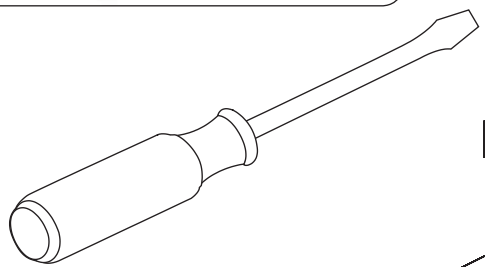
*Fully closed gripper*

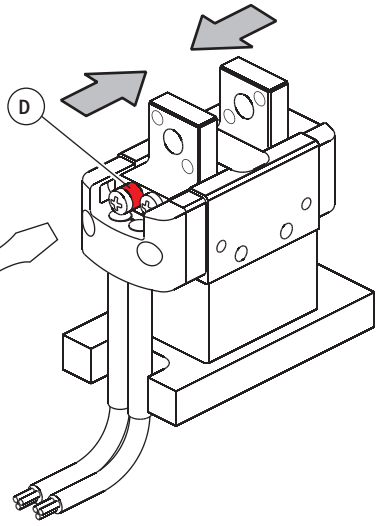


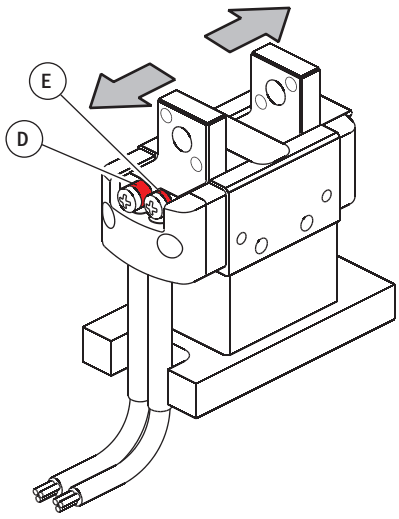

*Fully open gripper*

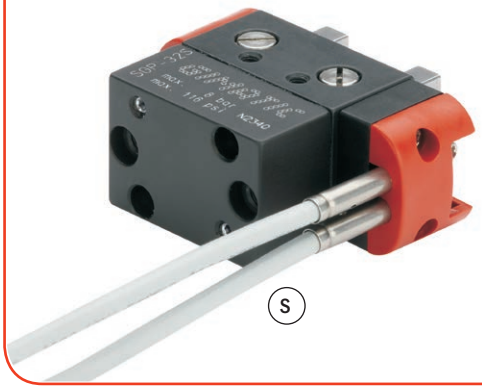



*The detected position can be adjusted by the screws.*
*The plastic spacer (D) has to be shortened according to the adjustment.*
*The second spacer (E) is to be installed, when the gripper is used for internal gripping applications.*



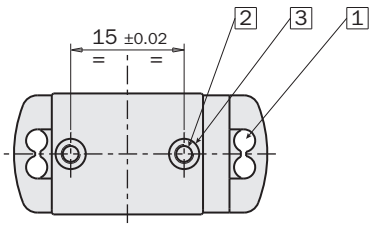

*Use 3mm diameter inductive sensors, on the SGP-20S and 4mm diameter, on the other sizes.*

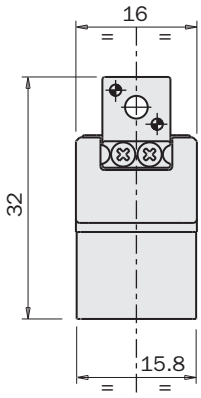
| | SGP-20S | SGP-25S | SGP-32S | SGP-40S |
|---|---|---|---|---|
| S | Ø3mm | Ø4mm | Ø4mm | Ø4mm |

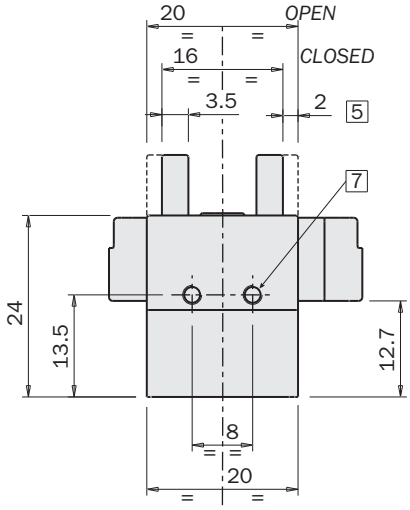
# SGP-S

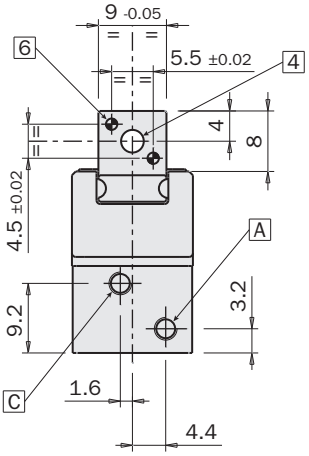
## *Dimensions (mm)*

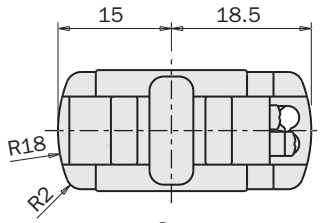
**SGP-20S**

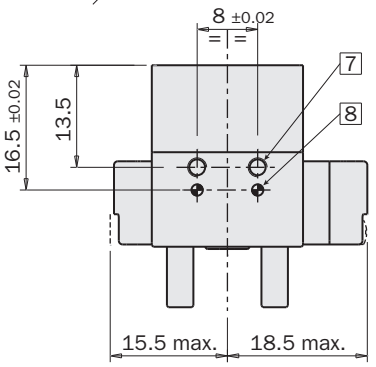


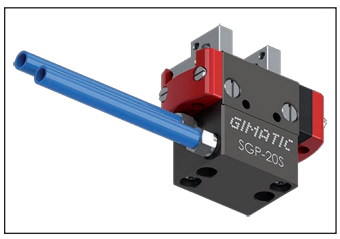



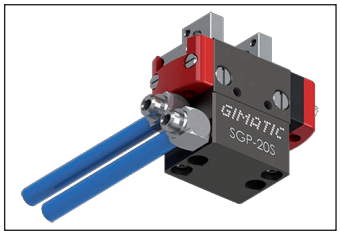




**RG.RO-1376-AS1**
*Straight M3 fitting*




**RG.RO-1376-AS2**
*Adjustable M3 fitting*




FIRST ANGLE PROJECTION

1 *Hole for inductive sensor Ø3*

2 (N°2) M2.5x6mm
*Hole for fastening*

3 (N°2) Ø4H8x2mm
*Centering sleeve hole*

4 Ø3H11x3.5mm
*Through hole for fastening*

5 *Stroke each jaw*

6 Ø1.5H8x3.5mm
*Dowel pin hole*

7 (N°2) M2.5x4mm
*Hole for fastening*

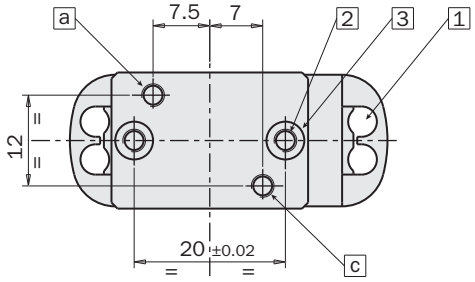
8 Ø1.5H8x3mm
*Dowel pin hole*

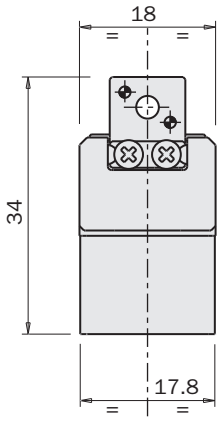
A M3
*Compressed air in A: gripper opening*

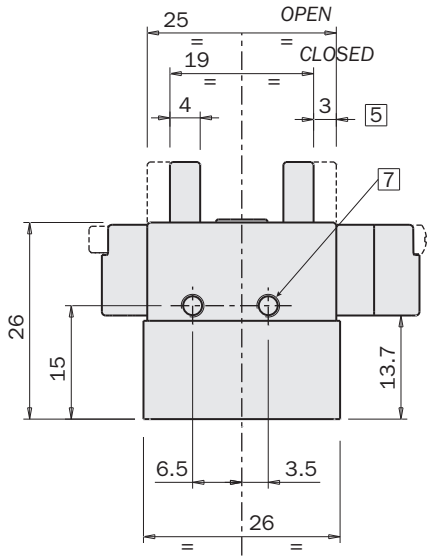
C M3
*Compressed air in C: gripper closing*

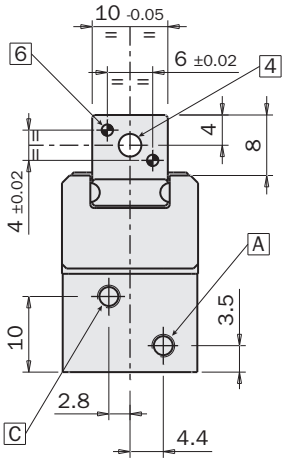
## *Dimensions (mm)*

**SGP-25S**

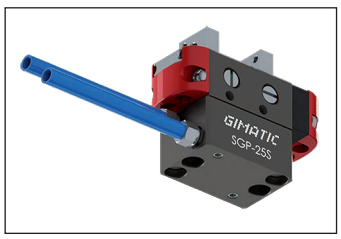


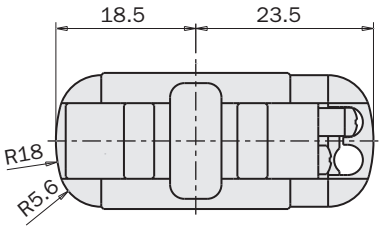



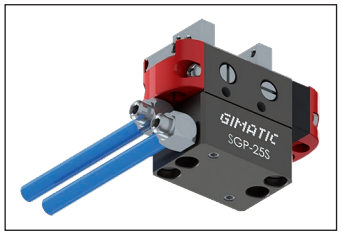



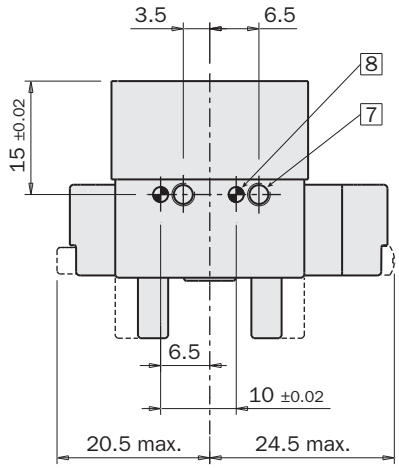

**RG.R0-1376-AS1**
*Straight M3 fitting*




**RG.R0-1376-AS2**
*Adjustable M3 fitting*




FIRST ANGLE PROJECTION

1 *Hole for inductive sensor Ø4*

2 (N°2) M3x7mm
*Hole for fastening*

3 (N°2) Ø5H8x2.4mm
*Centering sleeve hole*

4 Ø3H11x4mm
*Through hole for fastening*

5 *Stroke each jaw*

6 Ø1.5H8x4mm
*Dowel pin hole*

7 (N°2) M3x5mm
*Hole for fastening*

8 Ø2H8x4mm
*Dowel pin hole*

a M3
*Compressed air in a: gripper opening*

A M3
*Compressed air in A: gripper opening*

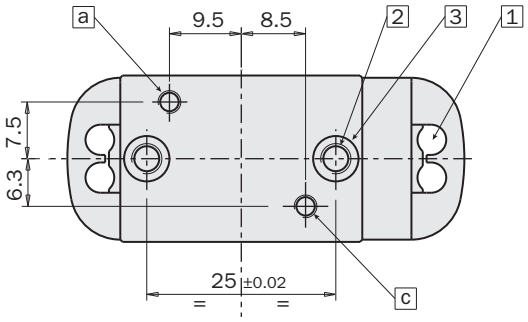
c M3
*Compressed air in c: gripper closing*

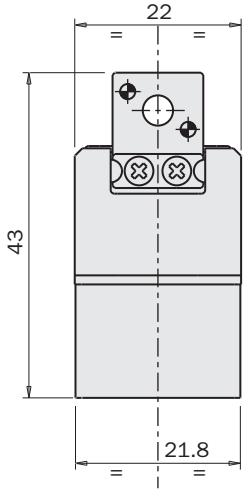
C M3
*Compressed air in C: gripper closing*

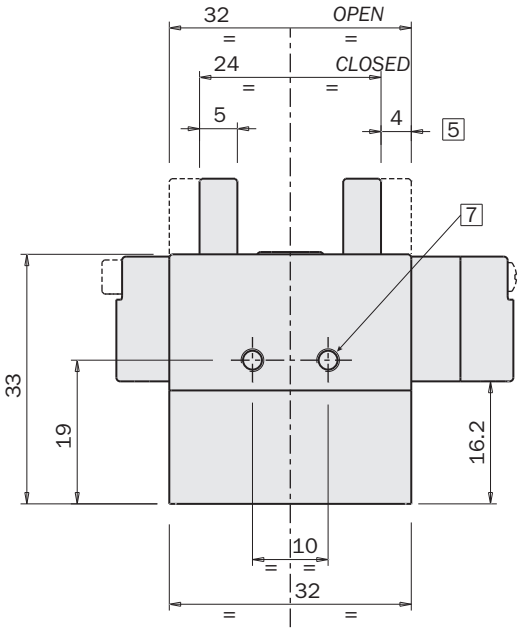
# SGP-S

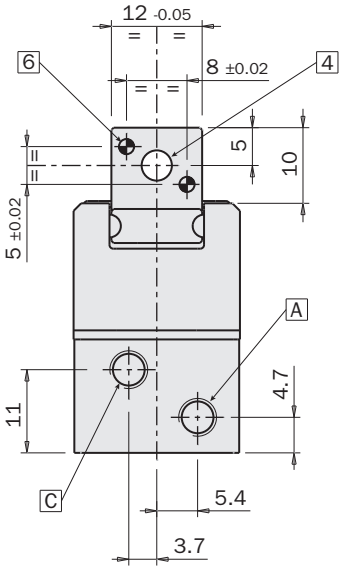
## *Dimensions (mm)*

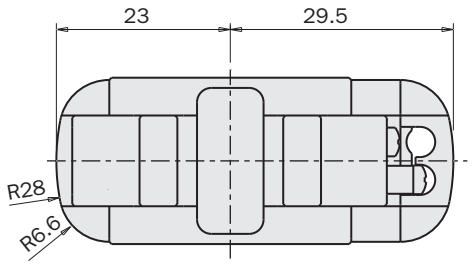
**SGP-32S**

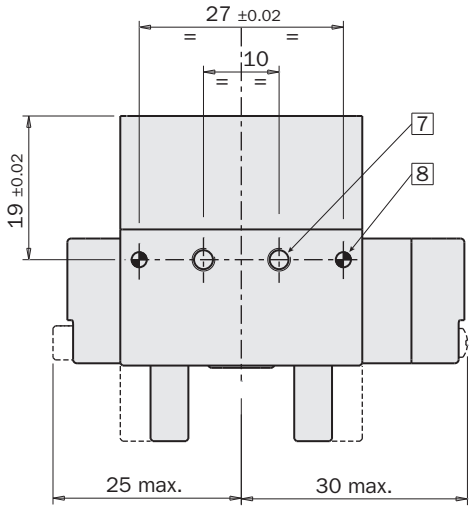



1 *Hole for inductive sensor Ø4*

2 (N°2) M4x7.5mm
*Hole for fastening*

3 (N°2) Ø6H8x2.9mm
*Centering sleeve hole*

4 Ø4H11x5mm
*Through hole for fastening*

5 *Stroke each jaw*

6 Ø2H8x5mm
*Dowel pin hole*

7 (N°2) M3x5mm
*Hole for fastening*

8 Ø2H8x5mm
*Dowel pin hole*

a M3
*Compressed air in a: gripper opening*

A M5
*Compressed air in A: gripper opening*

c M3
*Compressed air in c: gripper closing*

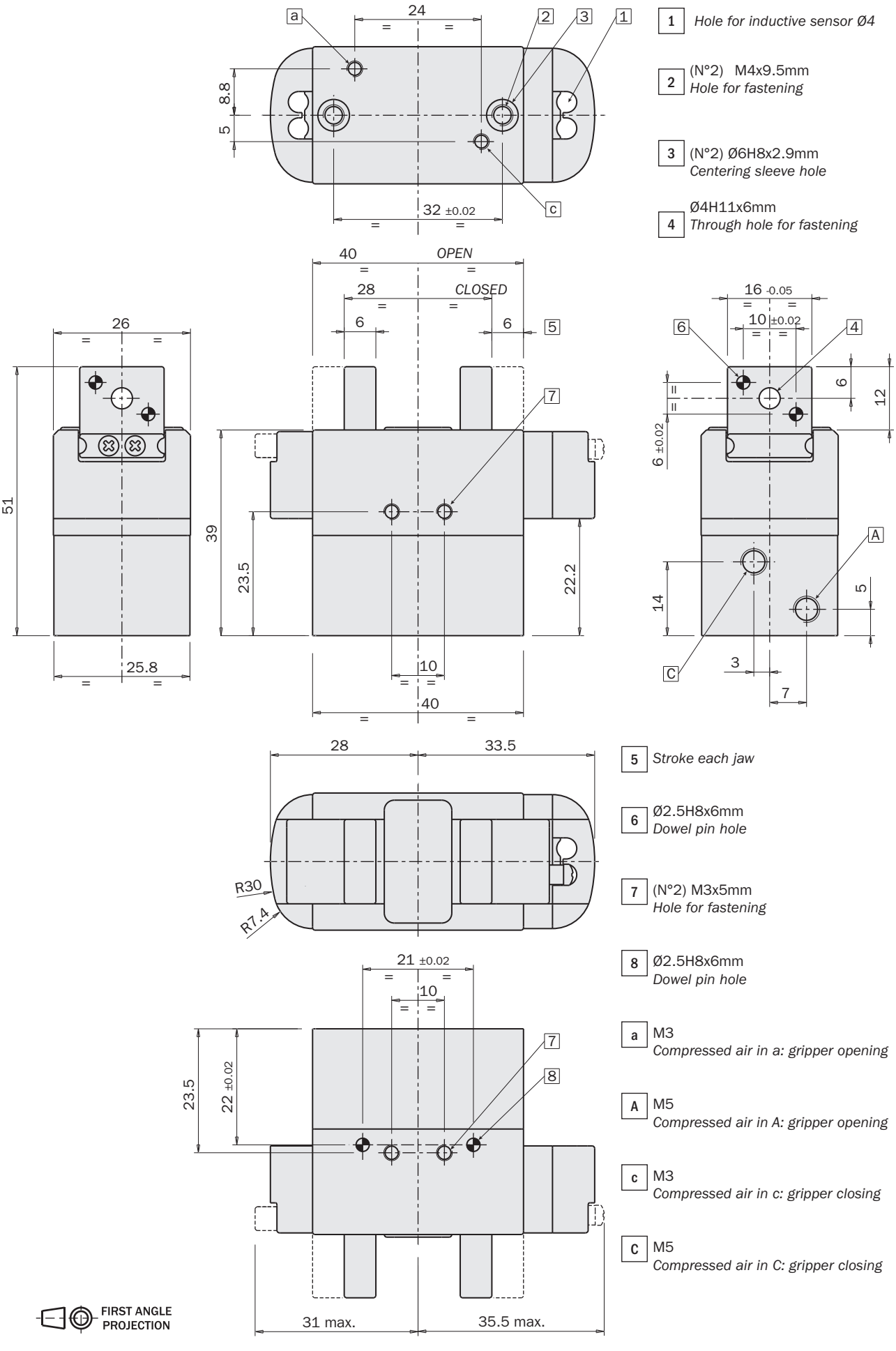
C M5
*Compressed air in C: gripper closing*

FIRST ANGLE PROJECTION

03/2015

## *Dimensions (mm)*

**SGP-40S**




**1** *Hole for inductive sensor Ø4*

**2** (N°2) M4x9.5mm
*Hole for fastening*

**3** (N°2) Ø6H8x2.9mm
*Centering sleeve hole*

**4** Ø4H11x6mm
*Through hole for fastening*

**5** *Stroke each jaw*

**6** Ø2.5H8x6mm
*Dowel pin hole*

**7** (N°2) M3x5mm
*Hole for fastening*

**8** Ø2.5H8x6mm
*Dowel pin hole*

**a** M3
*Compressed air in a: gripper opening*

**A** M5
*Compressed air in A: gripper opening*

**c** M3
*Compressed air in c: gripper closing*

**C** M5
*Compressed air in C: gripper closing*

FIRST ANGLE PROJECTION

03/2015

# SGP-S

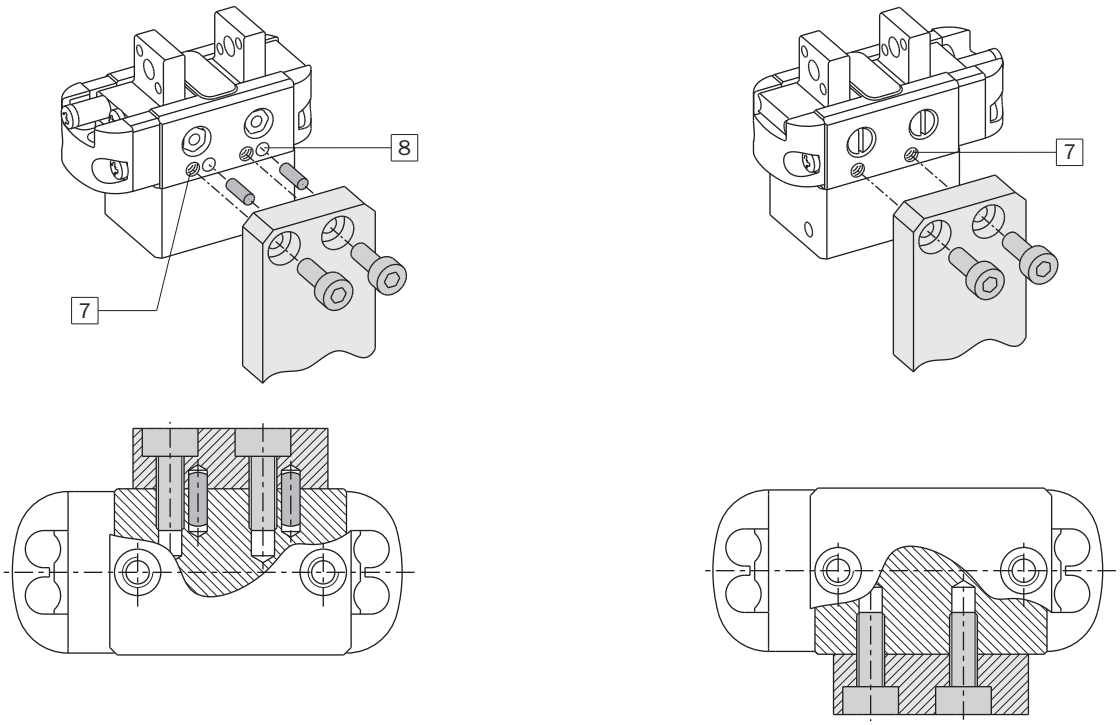
## *Fastening*

*The gripper can be fastened to a static or moving part.*
*When on a moving part, you must pay attention to the forces created by inertia over the gripper and its load.*

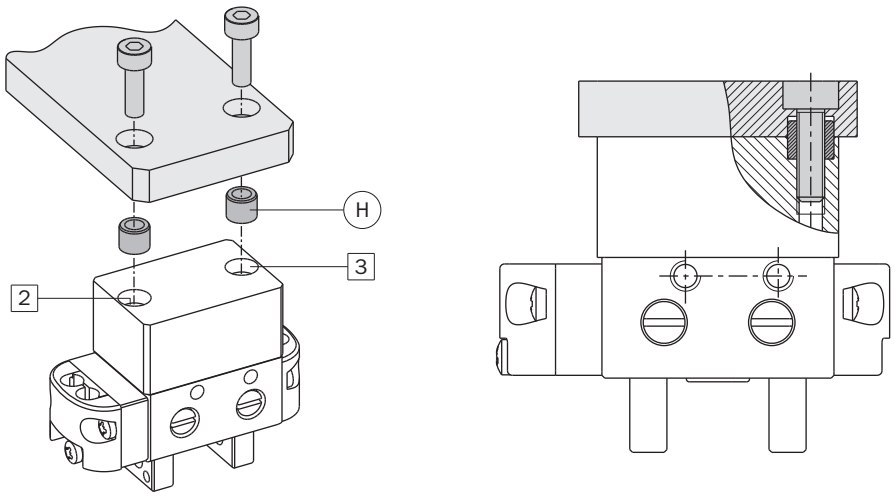
*1- To fasten the gripper on one side, use a plate with two through holes and two screws to be screwed on the threaded holes* [7]. *They are on both sides of the gripper housing.*
*The dowel pin holes* [8] *are on one only side.*

*2- To fasten gripper to base use two screws passing through the holes in the plate and screwed in the threaded holes* [2].
*Use also the two centering sleeves (H) supplied in the packaging, in the calibrated holes* [3].

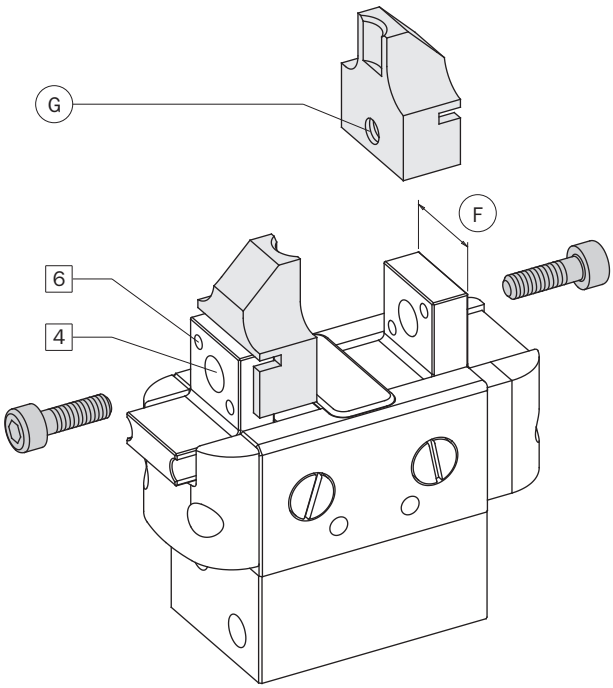
1

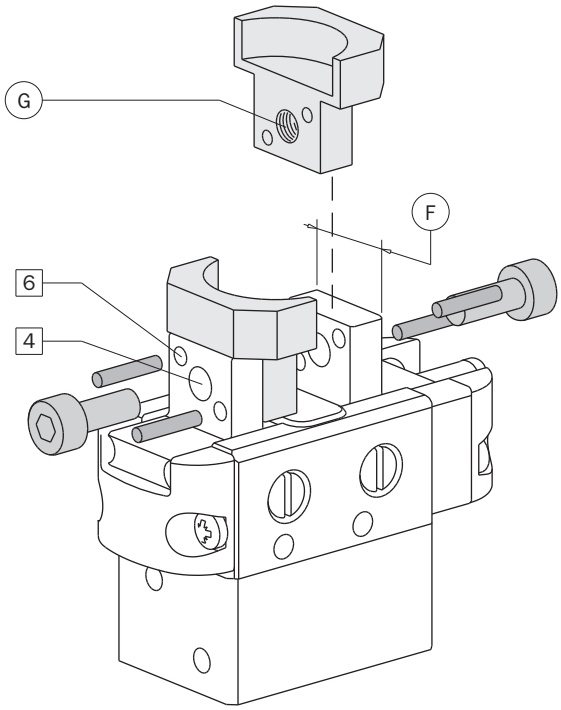



2



*The gripping tools must be as short and light as possible.*
*They must be fastened by one screw in the through hole* 4 *to be screwed in the threaded hole (G) in the gripping tool.*
*For a precise positioning on the jaw use the calibrated dimension (F), or the dowel pin holes* 6.



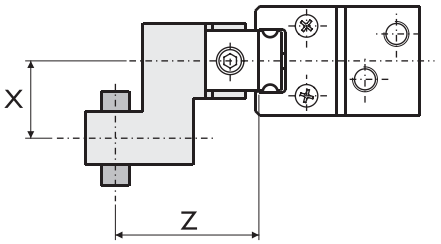




| | SGP-20S | SGP-25S | SGP-32S | SGP-40S |
|---|---|---|---|---|
| 7 | M2.5x4 mm | M3x5 mm | M3x5 mm | M3x5 mm |
| 2 | M2.5x6 mm | M3x7 mm | M4x7.5 mm | M4x9.5 mm |
| H | Ø4h8 x Ø2.6 x 4 mm | Ø5h7 x Ø3.2 x 4.4 mm | Ø6h7 x Ø4.2 x 5.3 mm | Ø6h7 x Ø4.2 x 5.3 mm |
| 4 | Ø3H11 x 3.5 mm | Ø3H11 x 4 mm | Ø4H11 x 5 mm | Ø4H11 x 6 mm |
| G | M3 | M3 | M4 | M4 |
| F | $9^{-0.05}$ mm | $10^{-0.05}$ mm | $12^{-0.05}$ mm | $16^{-0.05}$ mm |
| 3 | Ø4H8 x 2 mm | Ø5H8 x 2.4 mm | Ø6H8 x 2.9 mm | Ø6H8 x 2.9 mm |
| 8 | Ø1.5H8 x 3 mm | Ø2H8 x 4 mm | Ø2H8 x 5 mm | Ø2.5H8 x 6 mm |
| 6 | Ø1.5H8 x 3.5 mm | Ø1.5H8 x 4 mm | Ø2H8 x 5 mm | Ø2.5H8 x 6 mm |

# SGP-S

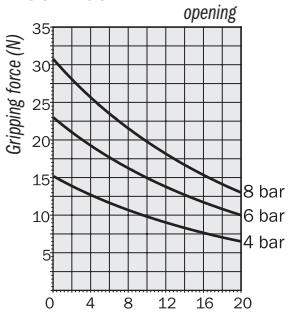
## Gripping force

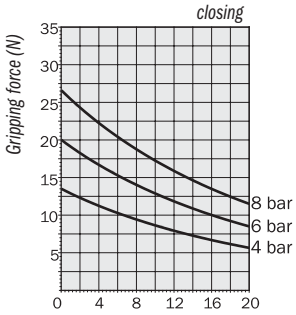
*The graphs show the medium gripping force on each jaw, as a function of the operating pressure, the gripping tool length Z and the overhanging X.*

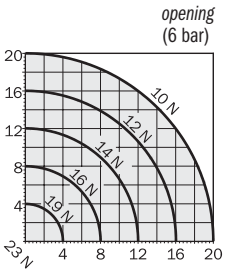


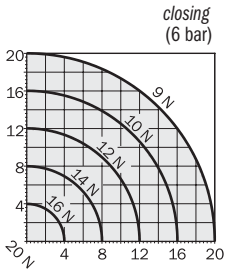

***The force shown in these graphs refers to one jaw. The total force is double.***

### SGP-20S

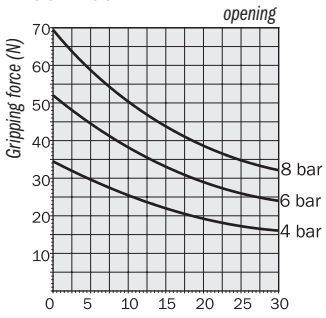


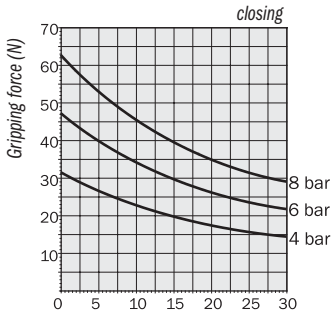



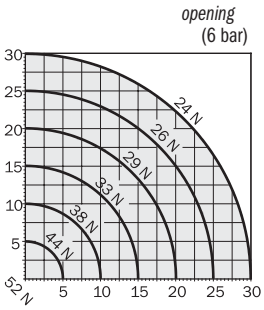



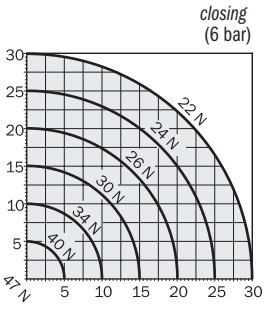




### SGP-25S

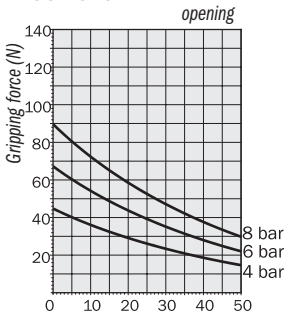


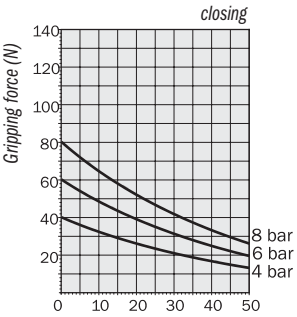



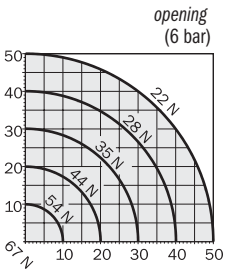



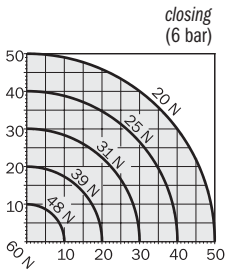




### SGP-32S

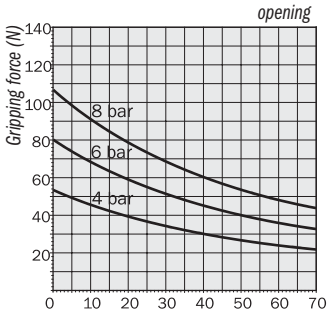


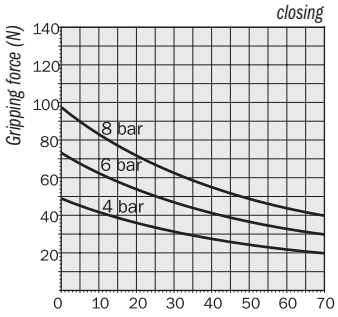



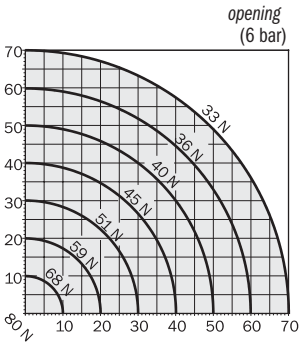



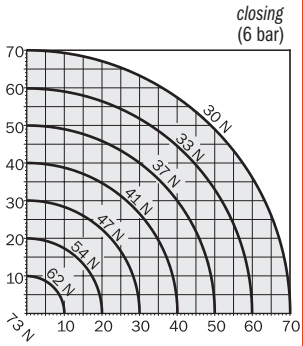




### SGP-40S



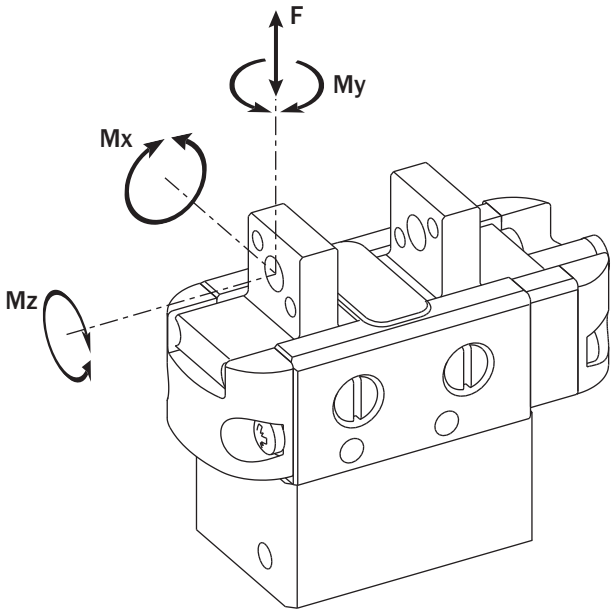



### *Safety loads*

*Check the table for maximum permitted loads.*
*Excessive forces or torques can damage the gripper, cause functioning troubles and endanger the safety of the operator.*
*F s, Mx s, My s, Mz s, are maximum permitted static loads. Static means with motionless jaws.*
*F d, Mx d, My d, Mz d, are maximum permitted dynamic loads. Dynamic means with running jaws.*
*The following tables show the specified maximum loads (m) on each gripping tool as function of closing or opening time. Use flow controllers (not supplied) to get the proper speed.*



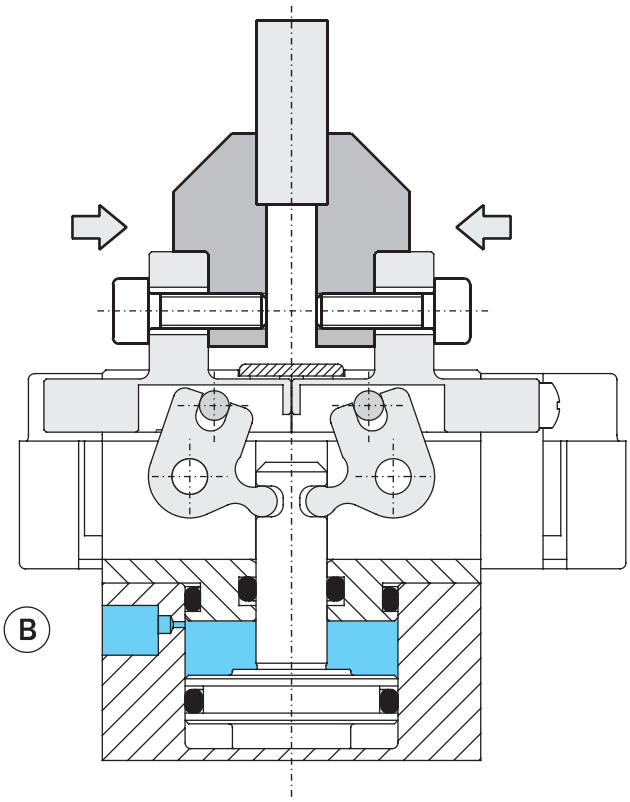

| | SGP-20S | SGP-25S | SGP-32S | SGP-40S |
|---|---|---|---|---|
| F s | 30 N | 50 N | 70 N | 120 N |
| Mx s | 1 Nm | 2 Nm | 4 Nm | 6 Nm |
| My s | 1 Nm | 2 Nm | 4 Nm | 6 Nm |
| Mz s | 1 Nm | 2 Nm | 4 Nm | 6 Nm |
| F d | 0.3 N | 0.5 N | 0.7 N | 1.2 N |
| Mx d | 1 Ncm | 2 Ncm | 4 Ncm | 6 Ncm |
| My d | 1 Ncm | 2 Ncm | 4 Ncm | 6 Ncm |
| Mz d | 1 Ncm | 2 Ncm | 4 Ncm | 6 Ncm |
| m 0.2s | 30 g | 50 g | 70 g | 120 g |
| m 0.05s | 10 g | 20 g | 30 g | 40 g |
| m 0.02s | 7 g | 15 g | 20 g | - |
| m 0.01s | 5 g | 10 g | - | - |

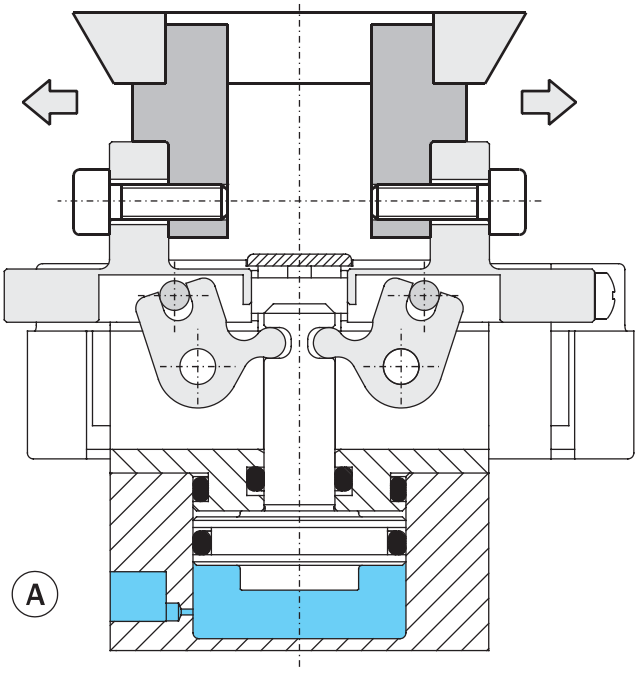
# SGP-S

## *Gripping*

*The gripper is double-acting for either internal (A) or external (B) gripping applications.*
*The opening force is higher.*

*Pressurized chamber*



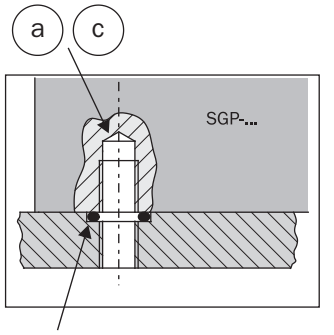



## *Compressed air feeding*

*The compressed air feeding can be accomplished on the lateral air ports (A and C) with fittings and hoses (not supplied).*
*Or (except SGP-20S) it can be accomplished directly by the bottom air ports (a and c) removing the plugs.*

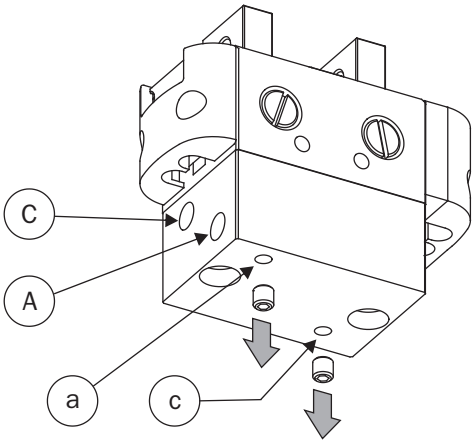
*Compressed air in A or a: gripper opening.*
*Compressed air in C or c: gripper closing.*

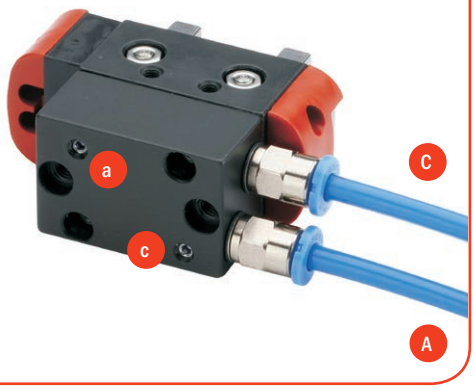
*The compressed air, must be filtered from 5 to 40 µm, not necessarily lubricated.*
*Maintain the medium selected at the start, lubricated or not, for the complete service life of the gripper.*
*The pneumatic circuit must be pressurized progressively, to avoid uncontrolled movements.*




O-Ring
Ø1.78x2.90

*O-Ring groove*
Ø6.3H11x1.3$^{+0.1}$

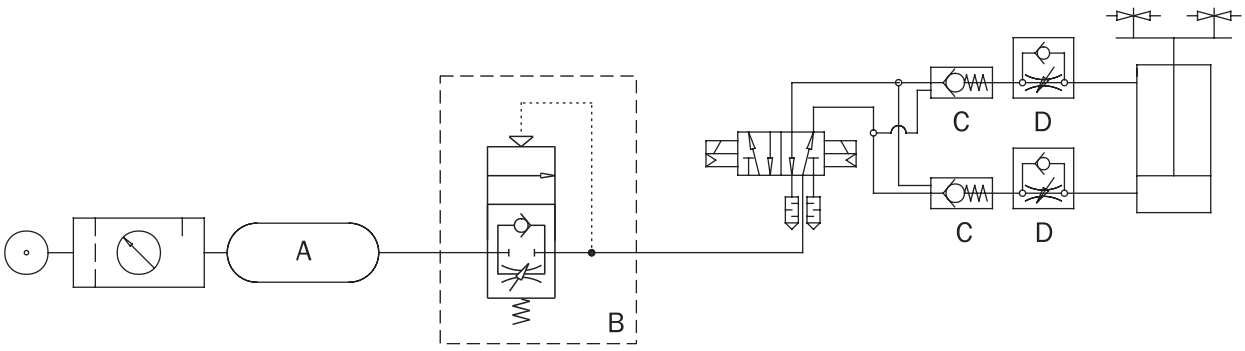



## *Pneumatic circuit*

*Possible problems on a compressed air circuit:*
*1- Pressure variation.*
*2- Pressurizing with empty cylinder.*
*3- Sudden pressure black-out.*
*4- Excessive speed of the jaws.*

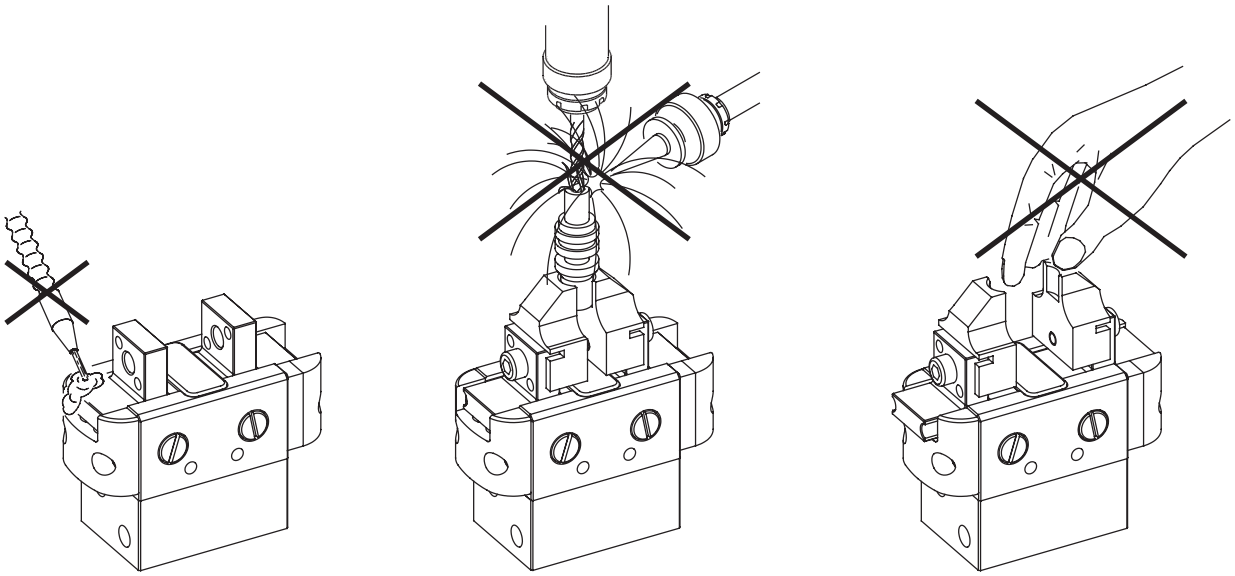
*Possible solutions:*
*1- Compressed air storage (A).*
*2- Start-up valve (B).*
*3- Safety valve (C).*
*4- Flow controller (D).*



# SGP-S

## *Caution*

*Avoid the gripper coming into contact with the following media: coolants which cause corrosion, grinding dust or glowing sparks. Make sure that nobody can place his/her hand between the gripping tools and there are no objects in the path of the gripper. The gripper must not run before the whole machine, on which it is mounted, complies with the laws or safety norms of your country.*

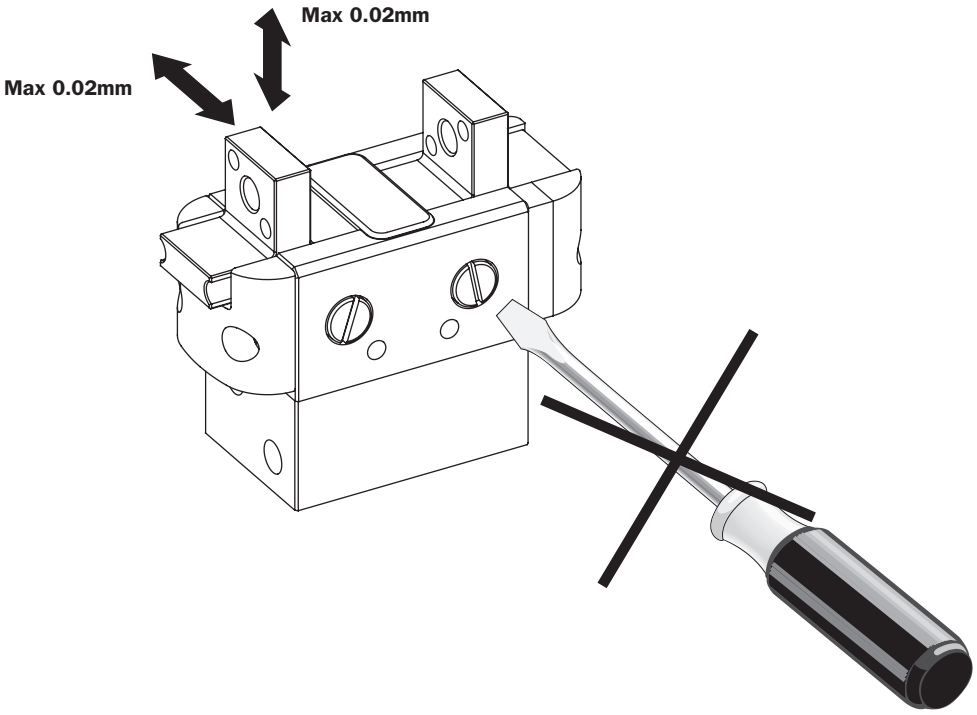


## *Maintenance*

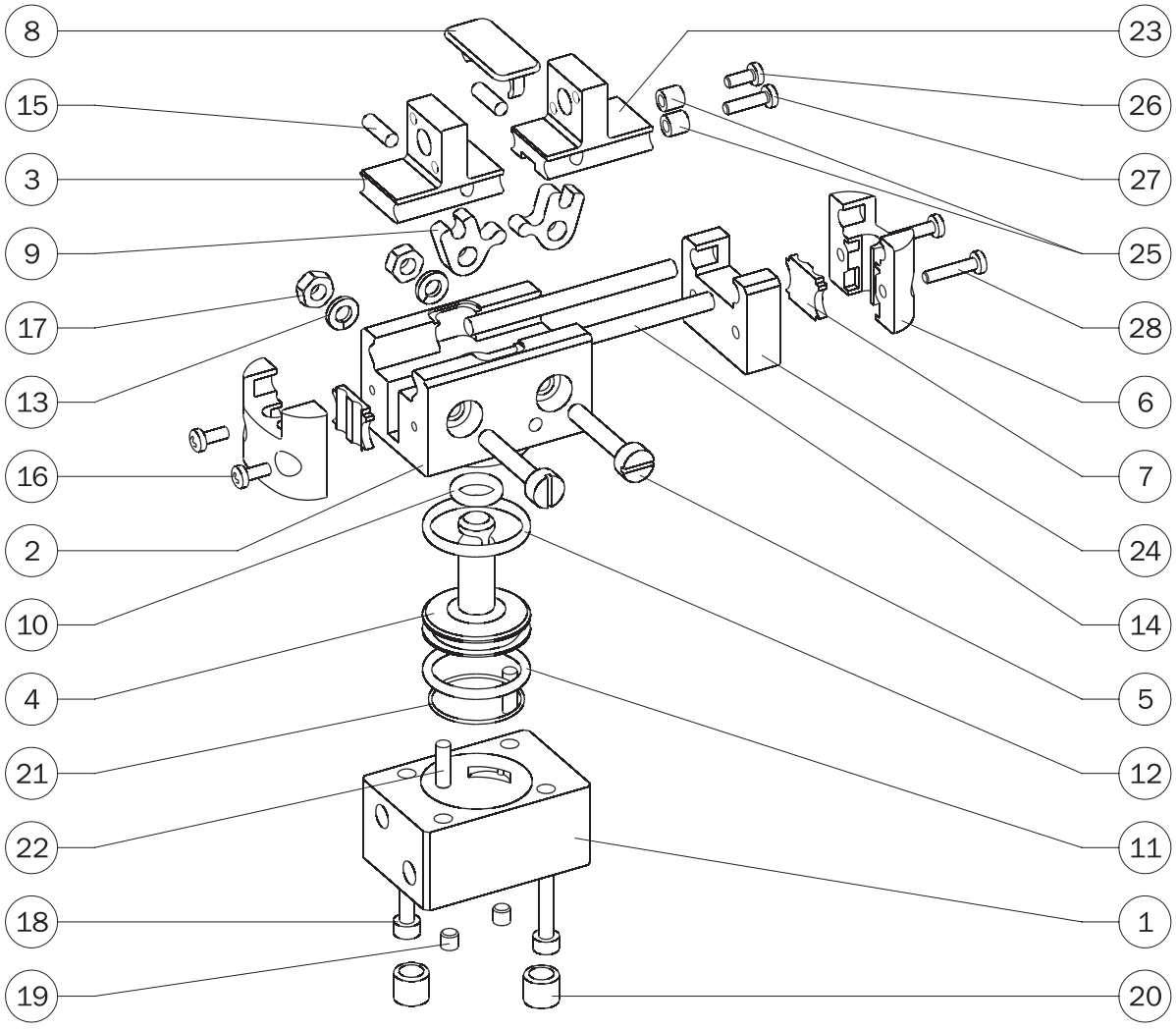
*Grease the gripper after 20 million cycles with:*

- *BERULUB FG-H 2 EP*
  *(Lubricant NSF H1 Registration No. 140486).*

*The jaw backlash, showed in the picture below, is set in factory.*
*NEVER USE THE ADJUSTING SCREWS TO MODIFY IT.*



## Part list




| | | SGP-20S | SGP-25S | SGP-32S | SGP-40S | | |
|---|---|---|---|---|---|---|---|
| 1 | *Gripper housing* | SGP-20-01 | SGP-25-01 | SGP-32-01 | SGP-40-01 | | *1* |
| 2 | *Jaw holder* | SGP-20-02 | SGP-25-02 | SGP-32-02 | SGP-40-02 | | *2* |
| 3 | *Left jaw* | SGP-20-03 | SGP-25-03 | SGP-32-03 | SGP-40-03 | | *3* |
| 4 | *Piston* | SGP-20-04 | SGP-25-04 | SGP-32-04 | SGP-40-04 | | *4* |
| 5 | *Special screw* | SGP-20-05 | SGP-25-05 | SGP-32-05 | SGP-40-05 | | *5* |
| 6 | *Head cap* | SGP-20-06 | SGP-25-06 | SGP-32-06 | SGP-40-06 | | *6* |
| 7 | *Sensor holder* | SGP-20-07 | SGP-25-07 | SGP-25-07 | SGP-25-07 | | *7* |
| 8 | *Protection* | SGP-20-08 | SGP-25-08 | SGP-32-08 | SGP-40-08 | | *8* |
| 9 | *Lever* | PAR-10-8C | SP-20-4 | SP-25-4 | SGP-40-09 | | *9* |
| 10 | *O-RING* | Ø1.78x3.69 (GUAR-044) | Ø1.78x4.48 (GUAR-029) | Ø1.78x6.07 (GUAR-039) | Ø1.78x6.75 (GUAR-012) | | *10* |
| 11 | *Dynamic gasket* | Ø1.78x7.66 (GUAR-045) | 16x9x2.5 (GUAR-002P) | Ø1.78x14 (GUAR-007) | 20x13x2.5 (GUAR-040P) | | *11* |
| 12 | *O-RING* | Ø1x9 (GUAR-168) | Ø1x14 (GUAR-084) | Ø1.78x14 (GUAR-007) | Ø1.78x17.17 (GUAR-076) | | *12* |
| 13 | *Elastic washer* | - | Ø2.2 DIN127A | Ø3.2 DIN127A | Ø3.2 DIN127A | | *13* |
| 14 | *Dowel pin* | Ø2.5x25mm DIN6325 | Ø2.5x32mm DIN6325 | Ø3x40mm DIN6325 | Ø3x50mm DIN6325 | | *14* |
| 15 | *Dowel pin* | - | Ø2x8mm DIN6325 | Ø2.5x8mm DIN6325 | Ø2.5x11.8 mm DIN5402 | | *15* |
| 16 | *Screw* | M1.6x5mm DIN7985 | M2x5mm DIN7985A INOX | M2x5mm DIN7985A INOX | M2x5 mm DIN7985A INOX | | *16* |
| 17 | *Nut* | - | M2 DIN936 INOX | M3 DIN934 INOX | M3 DIN934 INOX | | *17* |
| 18 | *Screw* | M2x12mm DIN7985 INOX | M2.5x12mm DIN912 INOX | M2.5x12mm DIN912 INOX | M3x20mm DIN912 INOX | | *18* |
| 19 | *Grub screw* | - | M3x3mm DIN913 | M3x3 mm DIN913 | M3x3 mm DIN913 | | *19* |
| 20 | *Centering sleeve* | SGP-20-09 | SGP-25-09 | SGP-32-09 | SGP-32-09 | | *20* |
| 21 | *O-RING* | - | - | Ø1x14 (GUAR-084) | - | | *21* |
| 22 | *Dowel pin* | Ø2x6.3mm DIN6325 | Ø2x8mm DIN6325 | Ø2.5x8mm DIN6325 | Ø2.5x8mm DIN6325 | | *22* |
| 23 | *Right jaw* | SGP-20S-01 | SGP-25S-01 | SGP-32S-01 | SGP-40S-01 | | *23* |
| 24 | *Spacer* | SGP-20-10 | UG-16-09 | UG-18-09 | SGP-40S-02 | | *24* |
| 25 | *Spacer* | SGP-20-11 | UG-16-11 | UG-16-11 | SGP-40S-03 | | *25* |
| 26 | *Screw* | M1.6x3mm DIN7985 | M2x5mm DIN7985 INOX | M2x5mm DIN7985 INOX | M2x5mm DIN7985 INOX | | *26* |
| 27 | *Screw* | M1.6x5mm DIN7985 | M2x8mm DIN7985 INOX | M2x8mm DIN7985 INOX | M2x12mm DIN7985 INOX | | *27* |
| 28 | *Screw* | M1.6x8mm DIN7985 | M2x10mm DIN7985 INOX | M2x10mm DIN7985 INOX | M2x10mm DIN7985 INOX | | *28* |