

## **Gripper Module**

### **GMK 20 / GMQ 20**

### **Rotary Gripper Modules**

### **GMQ 20-RM 16/GMQ 20-RM 25**

- **Declaration of Incorporation**
- **Module Information**
- **Montage Instructions**
- **Maintenance Instructions**



**These Montage Instructions apply to:**

Type	Order. No.	Type	Order. No.
<b>Gripper Module</b>			
<b>GMQ 20/P</b>	11010491	<b>GMQ 20/K</b>	11010477
<b>GMQ 20/K</b>	11010494	<b>GMQ 20/P</b>	11010483
<b>GMK 20/P-01</b>	50409826	<b>GMQ 20/P-01</b>	50409827

**Gripper- rotations module**

**GMQ 20/RM 16**

**GMQ 20/RM 25**

Version of this documentation:


GMQ20; GMQ20-RM16-25-OI-vers. 2.5 gb. 05.02.15

**Symbols:**

Assembly and initial start-up must be carried out by qualified Personnel only and according to these Montage Instructions.

 <b>WARNING</b>	
	<p>Indicates a possible dangerous situation.</p> <p><b>Non-compliance with this information can result in death or serious personal injuries (invalidity).</b></p>

 <b>CAUTION</b>	
	<p>Indicates a possible dangerous situation.</p> <p><b>Non-compliance with this information can result in damage to property or light to medium personal injuries.</b></p>

<b>NOTE</b>	
	<p>Indicates general notes, useful operator tips and operating recommendations which don't affect safety and health of the personnel.</p>

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## 1.0.0 EC Declaration for Incorporation (Document original)

1.1.0 According to: **2006/42/EC**

Standard: **EN ISO 12100:2010** (German Version)

The manufacturer:

**Afag Automation AG, Fiechtenstrasse 32, CH-4950 Huttwil**

hereby declares that the incomplete machine:

**Producte name:** **Gripper module / Rotary gripper Module** (pneum.)

**Types:** **GMK 20 / GMQ 20**  
**GMQ 20 /RM 16/25**

Sequential series: No. 50xxxxxx

- **Machinery Directive: 2006/42/EC**
- **Standard: EN ISO 12100:2010** (German Version)
- Safety of machinery General principles for risk assessment and risk reduction.
- The special technical documents shall be sent to a reasoned request by national authorities in printed documents or electronically (pdf).

### **Applied and fulfilled essential requirements:**

1.1; 1.1.1; 1.1.2; 1.2.3; 1.2.4.4; 1.3; 1.3.5; 1.3.6; 1.3.7; 1.3.9; 1.4.1; 1.5; 1.5.3; 1.6; 1.6.1; 1.6.3; 1.6.4; 1.7; 1.7.4; 1.7.4.1; 1.7.4.2

Who installs this incomplete machine or assemble with other machines, a risk assessment for its resulting machine which must make the provisions of the **EC directive: 2006/42 /EC**

**Norme:** **EN ISO 12100:2010** (German Version)

Agent:

For the compilation of the technically relevant documents:

Niklaus Röthlisberger, Producte Manager Afag Automation AG, CH-4950 Huttwil

Place, Date: Huttwil, 05.02.2015

Siegfried Egli



Managing Director  
Afag Automation HT



Niklaus Röthlisberger

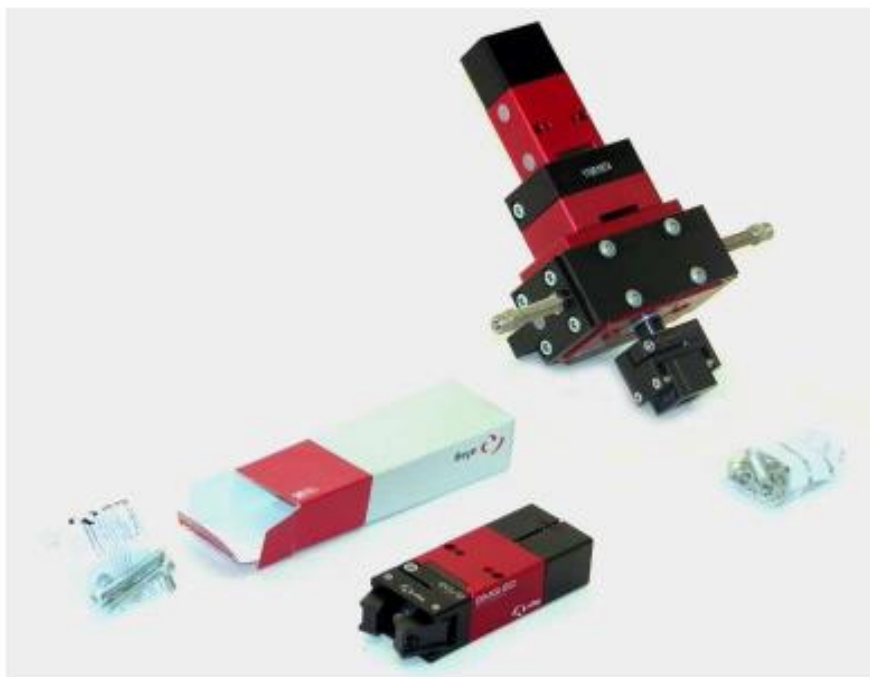



Producte Manager HT  
Afag Automation AG

## 2.0.0 Montage Instructions

### 2.1.0 Transport and storage (packing and unpacking)

 <b>CAUTION</b>	
	<p>The GMK 20, GMQ 20 module is packed in the original cardboard box, if the module is not handled property it may fall out of the box when unpacking and cause injuries to limbs or squeeze your fingers.</p> <p>The GMQ 20/RM 16/25 are delivered assembled and are packed not special, if not handled properly can fall down on this.</p>



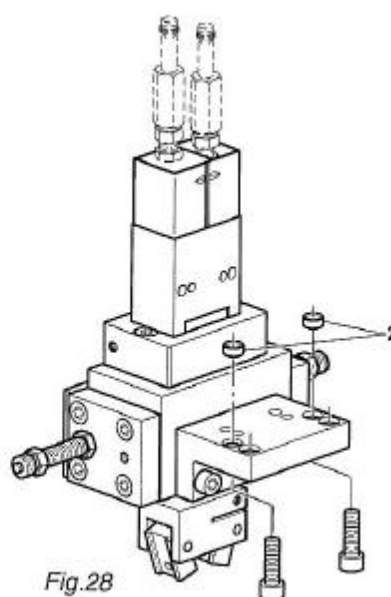
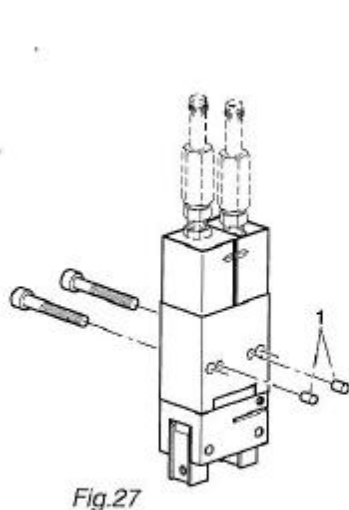
<b>NOTE</b>	
	<p><b>Consider please!</b> With each module security is settled a technical newspaper. This newspaper is to be reas busily by each person with the module.</p>

## 2.1.1 Possibilities of fastening: GMK 20, GMQ 20 and GMQ 20/RM16

### CAUTION



The GMQ 20, GMK 20 and GMQ 20/RM 16/25 gripper- (rotary gripper module) is a fine mechanical unit and must be handled with the necessary care and cleanliness during transport and storage as well as when handling, setting-up and assembling.



### Fixing the gripper module (rotary gripper module)

In Order to guarantee a high and repetitive fitting accuracy on assembly, during operation and on exchange of a module, the components of the Afag modules are equipped with a precise module centering.

In the gripper module, there are two centering bushings  $\varnothing$  4x6mm (Fig. 27)

In the gripper module, there are four centering bushings 9x4mm (Fig. 28)

## 2.1.2 Hole matrix and centering bushings

### GMK 20, GMQ 20 (GMQ 20/RM 16/25)

<b>Gripper module</b>	<b>GMK 20</b>	<b>GMQ 20-</b>
<b>Rotary gripper module</b>	<b>GMQ 20</b>	<b>RM16/RM 25</b>
Hole matrix	30mm	48mm (30mm)
Thread / bore hole	M5	M6 (M5)
Centering pin (H7)	4x6mm	9x4mm
Centering bushings (H7)		

Use the centering bushings included in the scope of supply for positioning and insert these sleeves in the diagonally opposite bore holes of the mounting grid.

Modul-Zentrierung	Centrage de module	Squaring of modules				
<b>Zentrierhülse</b>	<b>Douilles de centrage</b>	<b>Centering bushings</b>	<b>4h6x2.0 mm</b>	<b>5h6x2.5 mm</b>	<b>7h6x3.0 mm</b>	<b>8h6x3.5 mm</b>
Bestellnummer	Article No.	Order No.	50332257	50035831	11016850	50263565
Mass A	Dimension A	Dimension A	4 mm	5 mm	7 mm	8 mm
Mass B	Dimension B	Dimension B	2 mm	2.5 mm	3 mm	3.5 mm
Mass C	Dimension C	Dimension C	2.6 mm	3.2 mm	4.3 mm	5.4 mm
			<b>9h6x4.0 mm</b>	<b>12h6x5.0 mm</b>	<b>15h6x5.2 mm</b>	<b>19h6x5.8 mm</b>
			11004942	50187424	—	50189497
			9 mm	12 mm	15 mm	19 mm
			4 mm	4.8 mm	5.2 mm	5.8 mm
			6.5 mm	8.5 mm	10.5 mm	13 mm
<b>Befestigungsraster</b>	<b>Treme de fixation</b>	<b>Fixing grid</b>	<b>16x16 mm</b>	<b>20x20 mm</b>	<b>30x30 mm</b>	<b>38x38 mm</b>
Mass D	Dimension D	Dimension D	16 mm	20 mm	30 mm	38 mm
Mass E	Dimension E	Dimension E	8 mm	10 mm	15 mm	19 mm
Mass F	Dimension F	Dimension F	4x1.1 mm	7x1.6 mm	7x1.6 mm	8x3.5 mm
Mass G	Dimension G	Dimension G	M2.5	M3	M4	M5
			<b>48x48 mm</b>	<b>60x60 mm</b>	<b>75x75mm</b>	<b>96x96 mm</b>
			48 mm	60 mm	75 mm	96 mm
			24 mm	30 mm	37.5 mm	48 mm
			9x2.1 mm	12x2.5 mm	15x2.7 mm	19x5.8 mm
			M6	M8	M10	M12



### 2.1.3 Tightening torques for bolts

The screws to be used for assembly must at least satisfy the following conditions:


Standard: VDI 2230  
 Strength: class 8.8  
 Surface: galvanized blue, oiled or greased


Thread	Tightening moments
M3	1,1 ... 1,4 Nm
M4	2,6 ... 3,3 Nm
M5	5,2 ... 6,5 Nm
M6	9,0 ... 11,3 Nm
M8	21,6 ... 27,3 Nm

### This is an incomplete machine

**Installation of the GMQ (GMQ / RM) Gripper module, (Rotary gripper module) in a station/system.**

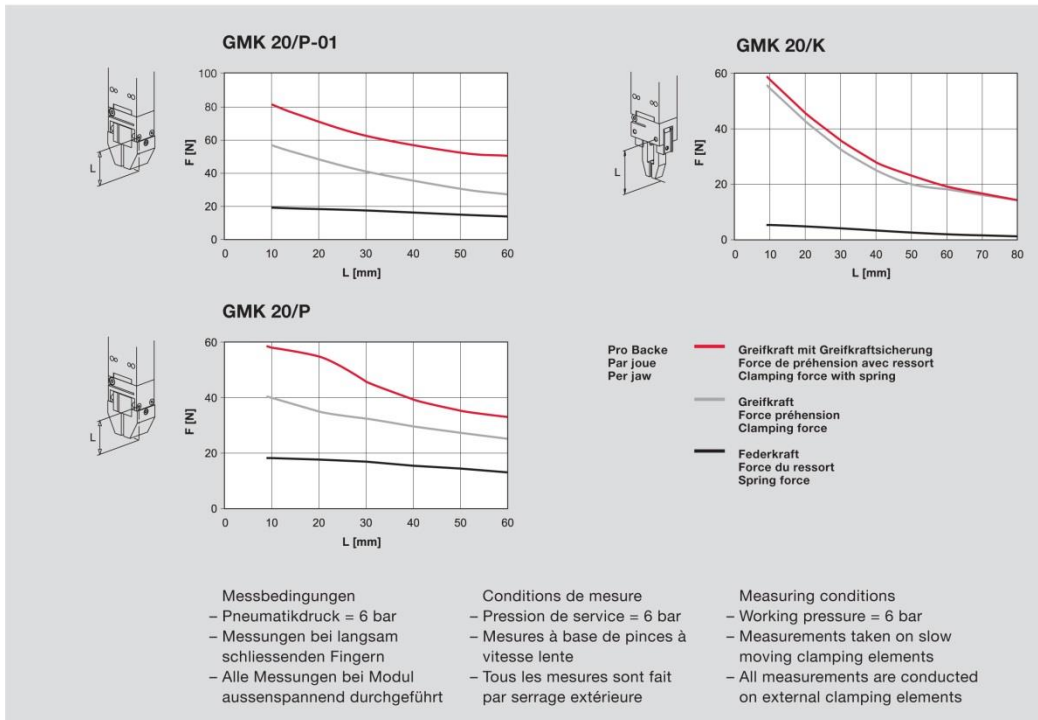
The range of GMQ and (GMQ / RM) is the shock-free gripper rotary motion of rigidly in the load for this module defined environmental and operational conditions, see technical data. The GMQ the mounting position GMQ (GMQ / RM) modules can be horizontally or vertically.

NOTE	
	<p><b>Before any activity on or with the GMQ and GM / RM modules, this instruction manual carefully. The GMQ, (GMQ / RM) modules may only be used there in accordance with the intended use.</b></p>

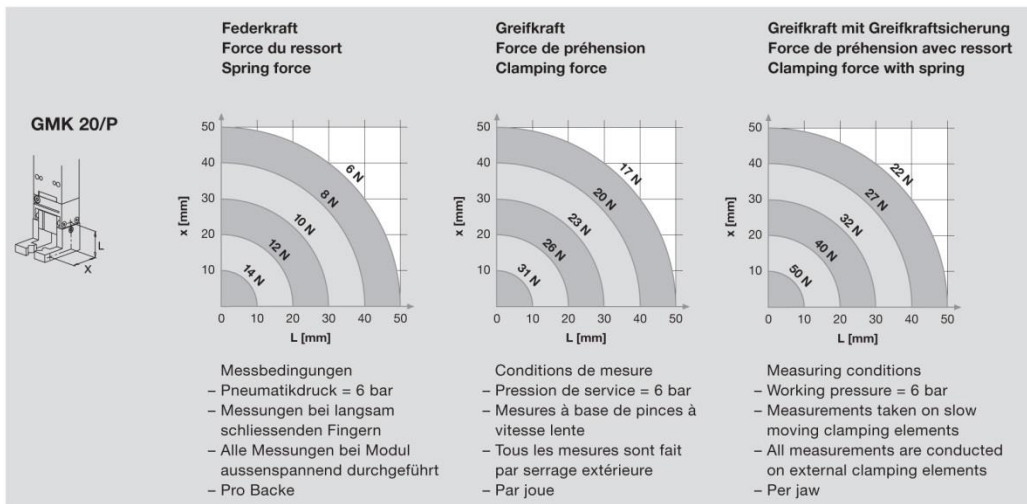
NOTE	
	<p><b>Safety instructions</b></p> <p>Modifications on the GMQ and GM / RM module that are not described in these Montage Instructions or have not been approved in writing by Afag Automation AG are not permitted. In case of improper changes or assembly, installation, operation and maintenance or repairs Afag rejects all liability.</p>

## 2.1.4 Diagramme GMK 20

ZENTRISCHE GREIFKRAFT-DIAGRAMME  
 DIAGRAMME DE SERRAGE CENTRAL  
 GRAPH OF GRIPPING FORCES CENTRAL



EXZENTRISCHE GREIFKRAFT-DIAGRAMME  
 DIAGRAMME DE SERRAGE EXCENTRIQUE  
 GRAPH OF GRIPPING FORCES ECCENTRICITY



### NOTE

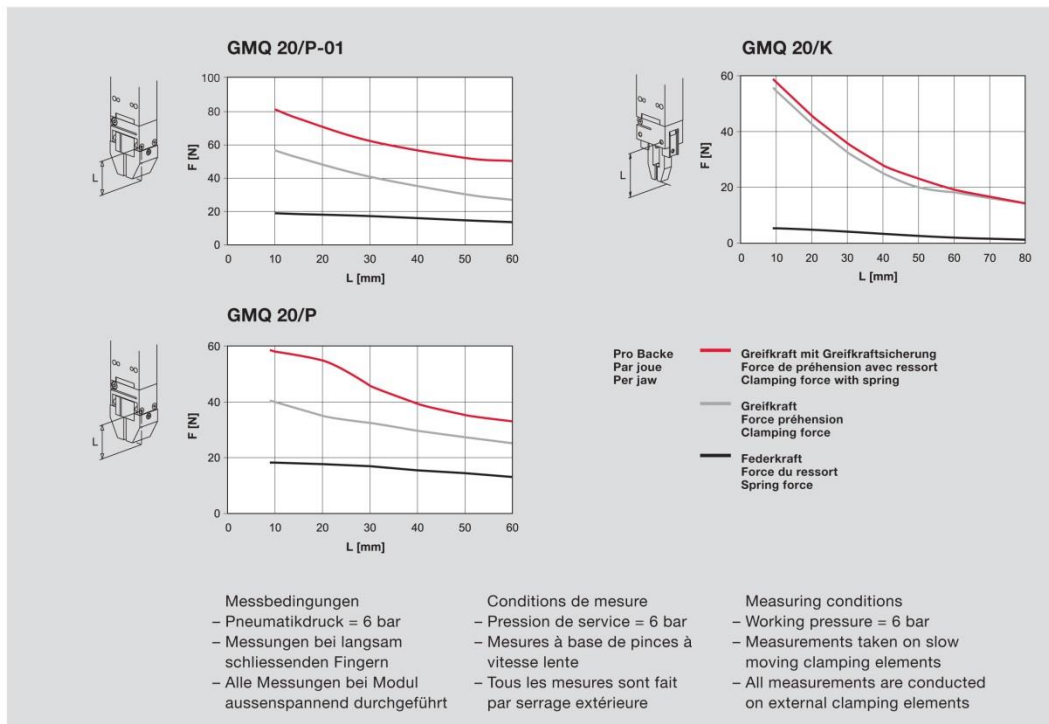


#### Gripper GM 20/K

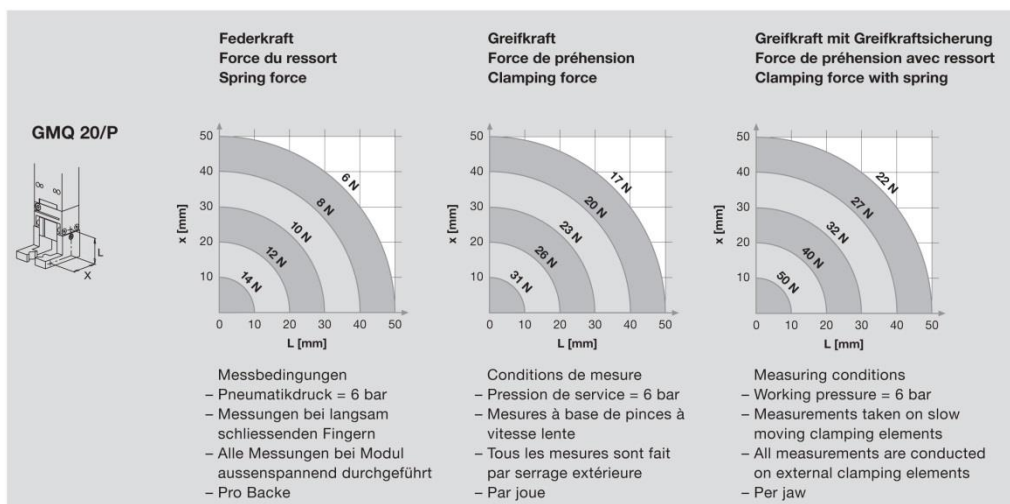
Ensure that the movement of the jaws occurs without impacts and bounce-free. This can be achieved by reducing the movement speed. Otherwise the service life will be shortend.

## 2.1.5 Gripper load GMQ 20

ZENTRISCHE GREIFKRAFT-DIAGRAMME  
 DIAGRAMME DE SERRAGE CENTRAL  
 GRAPH OF GRIPPING FORCES CENTRAL



EXZENTRISCHE GREIFKRAFT-DIAGRAMME  
 DIAGRAMME DE SERRAGE EXCENTRIQUE  
 GRAPH OF GRIPPING FORCES ECCENTRICITY



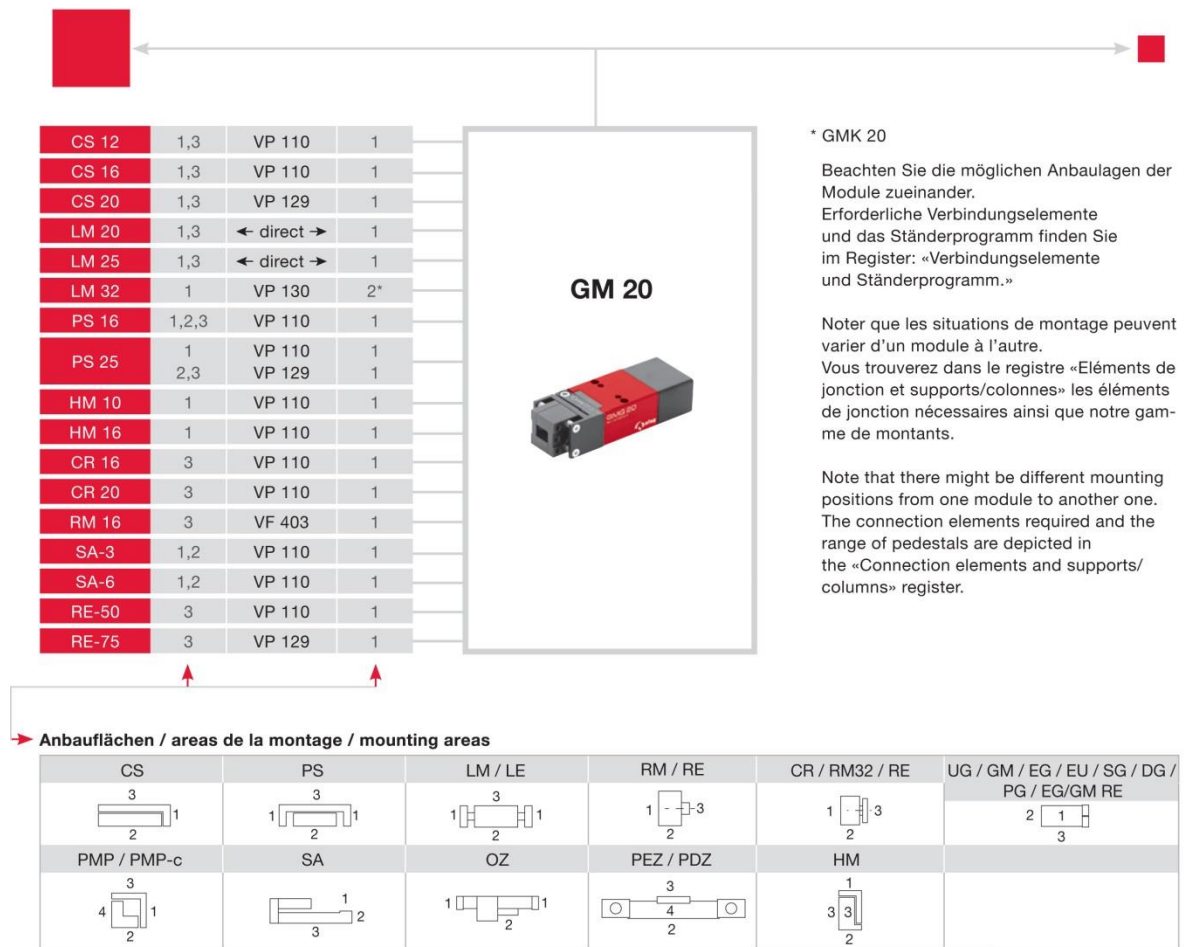
### NOTE



#### Gripper GMQ 20/K

Ensure that the movement of the jaws occurs without impacts and bounce-free. This can be achieved by reducing the movement speed. Otherwise the service life will be shortened.

## 2.1.6 Preferred combinations GMQ 20



**These operating instructions apply to:**

**Producte name:**                    **Gripper module (pneumatic)**  
   **Rotary gripper module**

**Types:**                                **GMQ 20 / GMK 20**  
   **GMQ 20 / RM 16-RM 25**

**Sequential series:**                **No. 50xxxxxx**

**This is an incomplete machine**

Who installs this incomplete machine or assemble with other machines, a risk assessment for its resulting machine which must make the provisions of the

**EC directive: 2006/42/EC**

**Standard: EN ISO 12100:2010** (German version)



Agent:


For the compilation of the technically relevant documents:

Niklaus Röthlisberger, Products Manager Afag Automation AG, CH-4950 Huttwil

### 3.1.1 Symbols

Assembly and initial start-up must be carried out by qualified personnel only and according to these instructions.

 <b>CAUTION</b>	
	<p>Indicates a possibly dangerous situation.</p> <p><b>Non-compliance with this information can result in damage to property or light to medium personal injuries.</b></p>

NOTE	
	<p>Indicates general notes, useful operator tips and operating recommendations which don't affect safety and health of the personnel.</p>

### 3.1.2 General description

#### This is an incomplete machine

The series of the GMQ 20 Gripper and (GMQ 20/RM 16/25 Rotary gripper module) is used for the Gripper and (Rotary gripper module) smooth movement of rigidly mounted loads under the ambient and operating conditions defined, see Technical data.


The installation position of the GMQ 20 Gripper- and (GMQ 20/RM 16/25 Rotary gripper module) can take place both vertically and horizontally.

Modifications on the GMQ 20 and GMQ 20/RM 16/25 module that are not described in these Montage Instructions or have not been approved in writing by Afag Automation AG are not permitted. In case of improper changes or assembly, installation, operation, maintenance or repairs, Afag Automation AG rejects all liability.

### 3.1.3 Description of the module GMQ 20

#### General

These Montage Instructions describe Gripper Module GM 20 and Rotary gripper module GM 20/RM 16/25, which can be operated with different grippers. All Information in these Montage Instructions relates to the above-mentioned types.

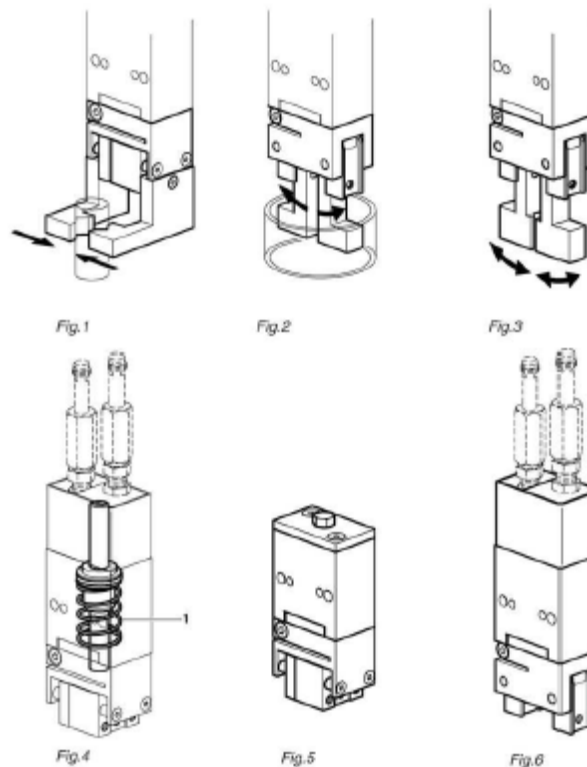
<b>NOTE</b>	
	<p>Special mention is given to type-specific information.</p>

#### Gripper module GMQ 20

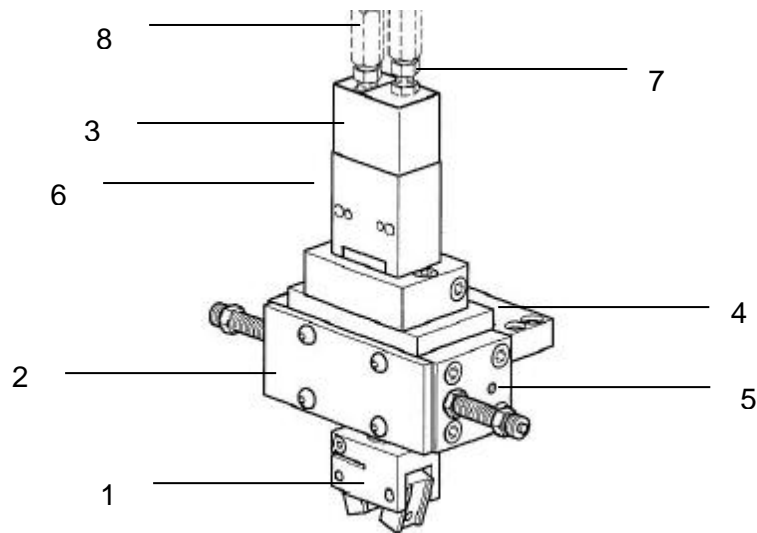
The pneumatically actuated GM 20 Gripper Module (piston  $\varnothing$  20mm), together with a gripper, are designed for gripping small parts.

The GMQ 20 is designed for outer tensioning (Fig.1), inner tensioning (Fig.2), or double-acting (Fig.3).

An integrated spring (1) serves as clamping force protection in the unpressurized condition. All GM's are delivered from the factory with outer tensioning (Fig.1) and can be modified to a different function as necessary.



### 3.1.4 Description of the rotary gripper module GMQ 20/RM 16/25



- |   |                   |   |                                   |
|---|-------------------|---|-----------------------------------|
| 1 | Gripper           | 5 | Pneumatic connection RM           |
| 2 | Rotary module     |   | Pneumatic connection, Gripper     |
| 3 | Gripper actuator  | 6 | actuator                          |
| 4 | Angle the mountig |   | Adjusting stop screw              |
|   |                   | 7 | Proximity switch (not included in |
|   |                   | 8 | the delivery)                     |

The rotary gripper module consists of a gripper (1), and rotary module (2), and the Gripper actuator (3) and the mounting angle (4). Connection (5) with the pneumatically on rotary module (6) and the connection on the gripper actuator.

The final positions will each have a stop screw (7) is et.

For sensing the end positions, the stop screw can be equipped with a proximity switch proximity switch holder and a 6.5mm. (not included in the delivery)

The movement in the end of travel can also be buffered by the hydraulic stop absorber.

(Rotary gripper module with shock absorber must be ordered separate).




### 3.1.5 Included in the delivery GMQ 20/GMK 20



Number	Description GMK 20	Description GMQ 20
2	Centering pin 4x6 mm	2 Centering pin 4x6 mm
2	Mounting screw M5x35 mm	2 Mounting screw M5x35 mm
2	U-Disc M5	2 U-Disc M5

### 3.1.6 Designated use

The series of the GMQ 20, GMK 20 gripper module and GMQ 20/ RM16/25 rotary gripper module is used for the movement of rigidly mounted loads in non-explosion hazardous ambient and operating conditions that are specified for this module ; see catalogue.

### 3.1.7 Safety Instructions

<b>NOTE</b>	
	<p>These Montage Instructions should be read carefully before carrying out any activity on or with the module.</p> <p>The module may only be deployed in accordance with the intended use.</p> <p>Modifications on the module that are not described in these Montage Instructions or have not been approved in writing by Afag are not permitted. In case of improper changes or assembly, installation, operation, maintenance or repairs, Afag rejects all liability.</p>

 <b>CAUTION</b>	
	<p><b>Connection of compressed air and operation of pneumatic systems may cause unpredictable movement which may result in personal injury or damage to property.</b></p>

When connecting compressed air for the first time make sure that all air chokes are closed. Ventilate the system slowly.


### 3.1.8 Included in the rotary gripper module GMQ 20/RM 16/25


Number	Description
1	Angle the mounting
2	Mounting screw M5x20
2	Rip discs M6
2	Rip discs M5
2	Centering pin 9x4 mm

### 3.1.9 Designated use

The series of the GMQ 20/RM 16/25 rotary gripper modules is used for the movement of rigidly mounted loads in non-explosion hazardous ambient and operating conditions that are specified for this module ; see catalogue.

### 3.2.0 Safety GMQ 20/RM 16/25

NOTE	
	<p>These Montage Instructions should be read carefully before carrying out any activity on or with the module.</p> <p>The module may only be deployed in accordance with the intended use.</p> <p>Modifications on the module that are not described in these Montage Instructions or have not been approved in writing by Afag are not permitted. In case of improper changes or assembly, installation, operation, maintenance or repairs, Afag rejects all liability.</p>

⚠ CAUTION	
	<p><b>Connection of compressed air and operation of pneumatic systems may cause unpredictable movement which may result in personal injury or damage to property.</b></p>

When connecting compressed air for the first time make sure that all air chokes are closed. Ventilate the system slowly.

### 3.2.1 Warranty

The module is designed for 40 million load alternations\* under the ambient conditions and conditions of use defined for this module, see catalogue. Wearing parts (shock absorbers and stop screws) are excluded from the warranty. The warranty includes repair or replacement of faulty Afag parts.


\*whichever comes first

When repairs are carried out by the customer without prior training or instruction by Afag AG the warranty will become void. Any additional claims are excluded.

### 3.2.2 Areas of application

The GMQ 20/GMK 20 are exclusively for the resort in any situation of load until a maximum of 40-57N, which the manipulation is not people, property and environmental hazard response. But they can also be combined with other modules as pick and place station used with the allowable loads must not be exceeded.

**Any other use is regarded as inadequate.**

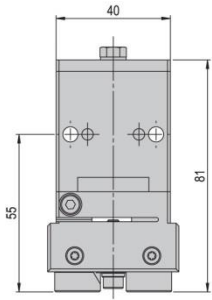
<b>NOTE</b>	
	<p>The manufacturer does not accept any liability for damage resulting from such use. The risk is that of the user alone.</p>

Intended use also includes paying attention to the Montage Instructions and observing the maintenance and repair instructions specified by the manufacturer.

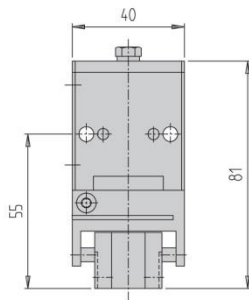
The GM gripper and GM rotary gripper module may only be operated and serviced by correspondingly trained personnel who have also profound knowledge of the dangers.

 <b>CAUTION</b>	
	<p><b>The applicable regulations for prevention of accidents and the other generally accepted safety-relevant and occupational safety and health regulations are to be followed.</b></p>

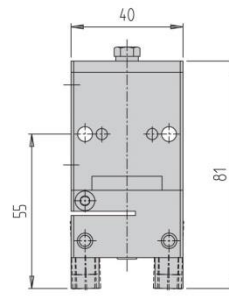
### 3.2.3 Dimensions drawing GMK 20/GMQ 20



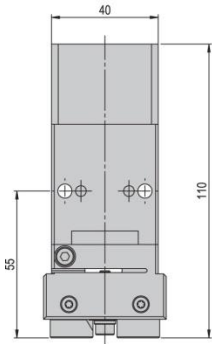
**GMK 20/P-01**



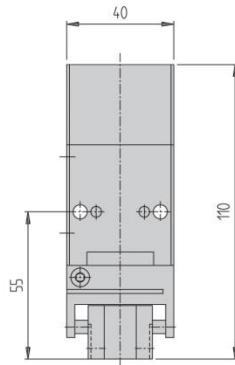
**GMK 20/P**



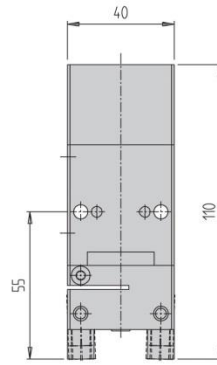
**GMK 20/K**



**GMQ 20/P-01**



**GMQ 20/P**



**GMQ 20/K**

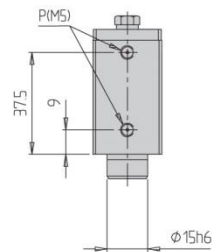
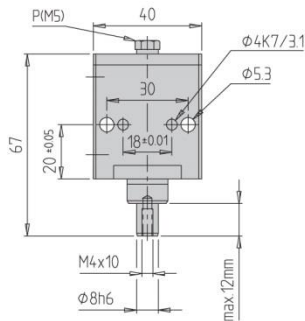
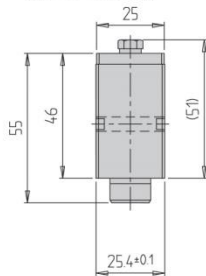
**Greifantrieb GMK 20**  
Bestellnummer

**Vérin de commande GMK 20**  
Article No.

**Gripper actuator GMK 20**  
Order No.

**11009148**

Masse 0.162 kg



P = Luftanschluss  
Raccord d'air  
Air connections



### 3.2.4 Technical data of the GMK 20/GMQ 20

Typ	Type	Type	GMK 20/P-01	GMK 20/P	GMK 20/K
Bestellnummer	Article No.	Order No	50409826	11010491	11010494
Zylinder	Cylindre	Cylindre	20 mm	20 mm	20 mm
Öffnungsweg	Course d'ouverture	Opening stroke	10 mm	10 mm	-
Öffnungswinkel	Angle d'ouverture	Opening angle	-	-	180°
*Greifzeit	*Temps de préhension	*Clamping time	0.11 s	0.11 s	0.16 s
*Greifkraft (zentrisch) max. zul. Masse pro Finger	*Force de serrage (central) max. poids autor. par doigt	*Prehensile power (central) max. permitt. weight p. finger	60 N 80 g	40 N 80 g	57 N 60 g
Federkraft	Force du ressort	Spring force	6-14 N	6-14 N	6-14 N
Wiederholgenauigkeit	Précision de répétition	Repeating precision	+/- 0.01 mm	+/- 0.02 mm	+/- 0.02 mm
Betriebs Temperatur	Température d'utilisation	Temperature operation	0 °C..+50 °C	0 °C..+50 °C	0 °C..+50 °C
Luftanschlüsse	Raccords d'air	Air connections	M5	M5	M5
Betriebsdruck	Pression d'alimentation	Operating pressure	6 bar +/-2	6 bar +/-2	6 bar +/-2
Luftverbrauch / Zyklus	Consommation d'air/cycle	Air consumption/cycle	0.021NL	0.021NL	0.021 NL
Modulgewicht	Poids du module	Weight of module	0.253 kg	0.253 kg	0.266 kg
Einbaulage	Position de montage	Mounting position	✚	✚	✚
Befestigungsrastrer	Trame de fixation	Fixing grid	30 mm	30 mm	30 mm

Die technischen Daten beziehen sich auf einen Nenndruck von 6 bar und Afag Standard-Testbedingungen.  
\*Greifkraft Diagramme beachten.

#### Im Lieferumfang inbegriffen:

2 Zentrierstifte Ø 4 x 6 mm  
2 Montageschrauben M5 x 35 mm  
2 U-Scheiben M5

Das GM 20 kann mit geölter oder ölfreier Luft betrieben werden.  
Reinraumklasse:  
10 000 (Federal Standard 209E)

Les caractéristiques techniques se basent sur une pression de consigne de 6 bar et les tests standard Afag.  
\*Diagramme de serrage de noter.

#### La livraison comprend:

2 Goupilles de centrage Ø 4 x 6 mm  
2 Vis montage M5 x 35 mm  
2 Disque M5

Pour GM 20 on peut utiliser aussi bien de l'air huilé que de l'air exempt d'huile.  
Classe de salle blanche:  
10 000 (Federal Standard 209E)

The technical data refer to a nominal pressure of 6 bar under Afag standard test conditions.  
\*Graph of gripping forces note.

#### Included in the delivery:

2 Centering pins Ø 4 x 6 mm  
2 Mounting screw M5 x 35 mm  
2 Disc M5

The GM 20 may be operated with oil-containing or oil-free air.  
Clean room class:  
10 000 (Federal Standard 209E)

Typ	Type	Type	GMQ 20/P-01	GMQ 20/P	GMQ 20/K
Bestellnummer	Article no.	Order No.	50409827	11010483	11010477
Zylinder	Cylindre	Cylindre	20 mm	20 mm	20 mm
Öffnungsweg	Course d'ouverture	Opening stroke	10 mm	10 mm	-
Öffnungswinkel	Angle d'ouverture	Opening angle	-	-	180°
*Greifzeit	*Temps de préhension	*Clamping time	0.11 s	0.11 s	0.16 s
*Greifkraft (zentrisch) max. zul. Masse pro Finger	*Force de serrage (central) max. poids autor. par doigt	*Prehensile power (central) max. permitt. weight p. finger	60 N 80 g	40 N 80 g	57 N 60 g
Wiederholgenauigkeit	Précision de répétition	Repeating precision	+/- 0.01 mm	+/- 0.02 mm	+/- 0.02 mm
Betriebs Temperatur	Température d'utilisation	Temperature operation	0 °C..+50 °C	0 °C..+50 °C	0 °C..+50 °C
Luftanschlüsse	Raccords d'air	Air connections	M5	M5	M5
Betriebsdruck	Pression d'alimentation	Operating pressure	6 bar +/-2	6 bar +/-2	6 bar +/-2
Luftverbrauch / Zyklus	Consommation d'air cycle	Air consumption cycle	0.021 NL	0.021 NL	0.021 NL
Modulgewicht	Poids du module	Weight of module	0.322 kg	0.322 kg	0.335 kg
Einbaulage	Position de montage	Mounting position	✚	✚	✚
Befestigungsrastrer	Trame de fixation	Fixing grid	30 mm	30 mm	30 mm

Die technischen Daten beziehen sich auf einen Nenndruck von 6 bar und Afag Standard-Testbedingungen.  
\*Greifkraft Diagramme beachten.

#### Im Lieferumfang inbegriffen:

2 Zentrierstifte Ø 4 x 6 mm  
2 Montageschrauben M5 x 35 mm  
2 U-Scheiben M5

Das GM 20 kann mit geölter oder ölfreier Luft betrieben werden.  
Reinraumklasse:  
10 000 (Federal Standard 209E)

Les caractéristiques techniques se basent sur une pression de consigne de 6 bar et les tests standard Afag.  
\*Diagramme de serrage de noter.

#### La livraison comprend:

2 Goupilles de centrage Ø 4 x 6 mm  
2 Vis montage M5 x 35 mm  
2 Disque M5

Pour GM 20 on peut utiliser aussi bien de l'air huilé que de l'air exempt d'huile.  
Classe de salle blanche:  
10 000 (Federal Standard 209E)

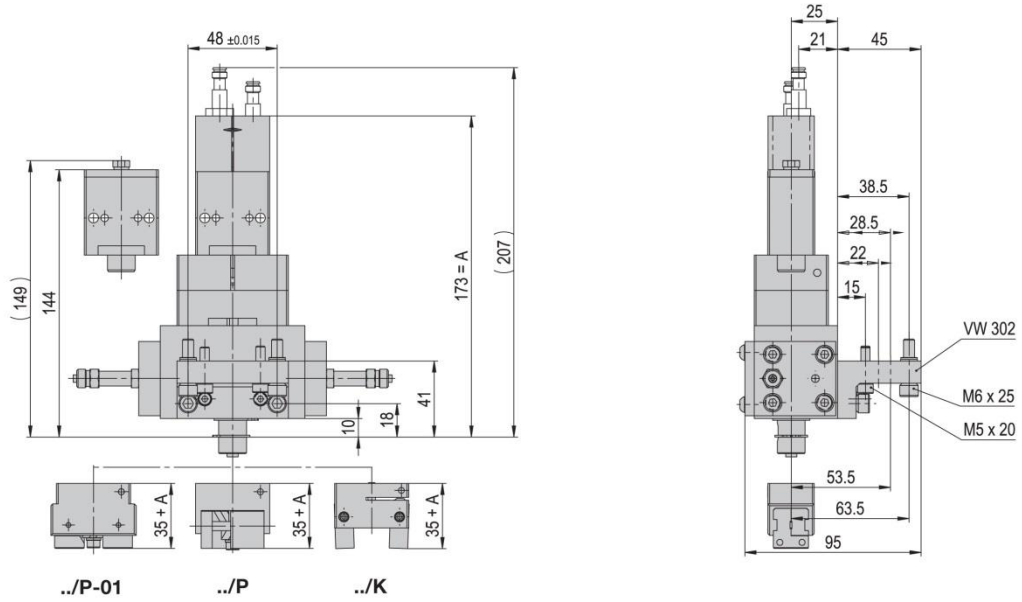
The technical data refer to a nominal pressure of 6 bar under Afag standard test conditions.  
\*Graph of gripping forces note.

#### Included in the delivery:

2 Centering pins Ø 4 x 6 mm  
2 Mounting screw M5 x 35 mm  
2 Disc M5

The GM 20 may be operated with oil-containing or oil-free air.  
Clean room class:  
10 000 (Federal Standard 209E)

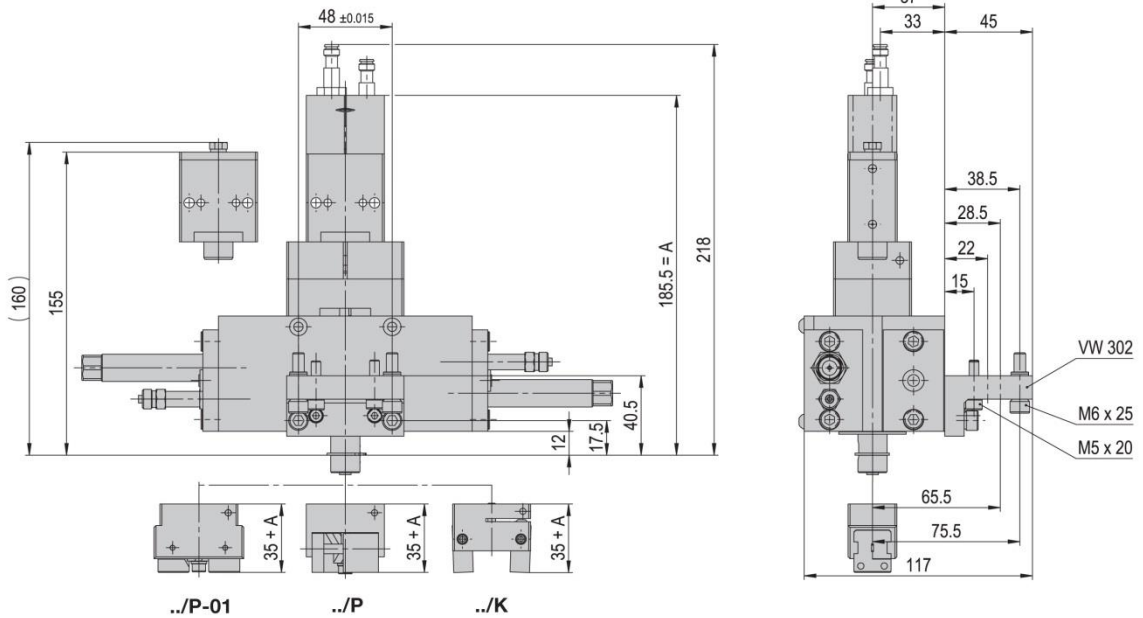
### 3.2.5 Dimensions drawing GMQ 20/RM 16/RM 25



#### GMQ 20/RM 16

Greifantrieb hinten  
 Vérin de commande en arrière  
 Gripper actuator in the back

Drehmoment / Couple de rotation / Torque: 0.6 Nm (6 bar)

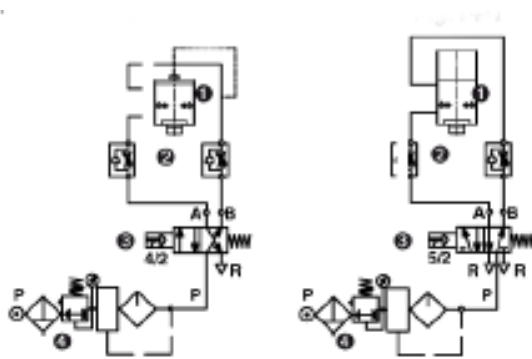


#### GMQ 20/RM 25

Greifantrieb hinten  
 Vérin de commande en arrière  
 Gripper actuator in the back

Drehmoment / Couple de rotation / Torque: 2.5 Nm (6 bar)

### 3.2.6 Pneumatic connection GMK 20/GMQ 20

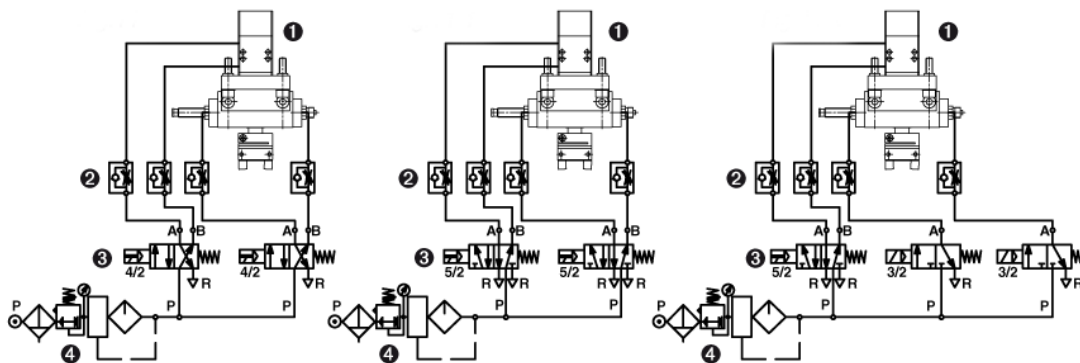


- 1 Gripper actuator
- 2 One-way restrictor
- 3 Direction valve (Standard 5/2)
- 4 Maintenance unit
- P Compressed air connection

### Pneumatic connection GMQ 20/RM 16/25

At the base of the rotary module are located on both sides of the pneumatic connections M5.

Gripper actuator on the side are two pneumatic connections M5



- 1 Gripper actuator
- 2 One-way restrictor
- 3 Direction valve (standard 5/2)
- 4 Maintenance unit
- P Compressed air connection

## NOTE



**Minimal compressed air quality according to ISO 8573-1; 2010 (7-4-4)**




### 3.2.8 Adjusting the GMK 20/GMQ 20

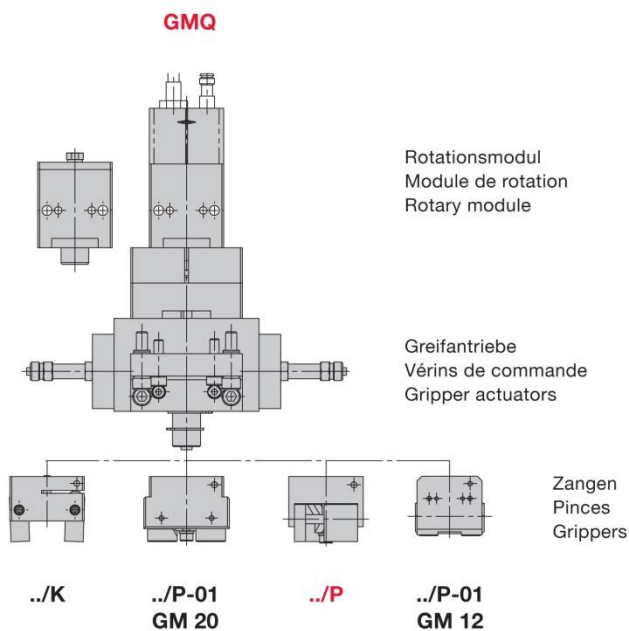
Afag AG achieves the following delivery conditions for the GM gripper modules.

#### Gripper module

The GM actuator and gripper can be delivered as individual modules, where the assembly is carried out by the customer, or as pre-assembled module by the factory.


#### Gripper rotary module

<b>NOTE</b>	
	<p>All GM's are delivered ex. Works with outer tensioning (unpressurized closed) and can be modified for a different function as necessary.</p> <p>Here, the GM, gripper and RM are adjusted to the desired combination and the module is optimally set at the factory.</p>



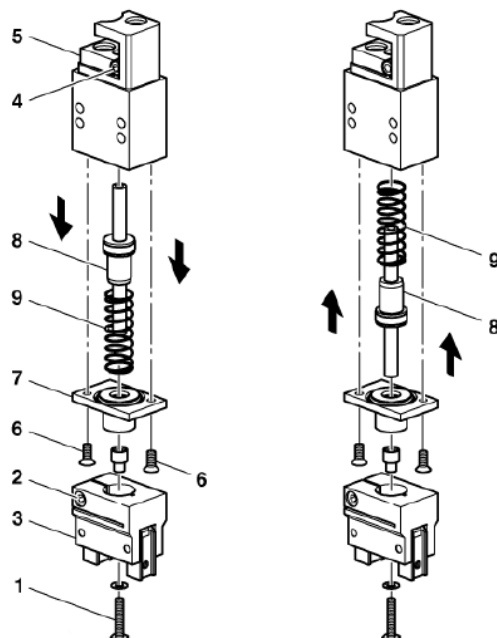


### 3.2.9 Modifying the GMQ 20 to inner tension

<b>NOTE</b>	
	<p>All gripper modules are shipped from the factory outside exciting. (Closed) works with external power and can be changed for another function if necessary.</p>

#### Modifying the GMQ 20 to inner tension

1. Loosen screw (1+2) and remove the gripper (3).
2. Loosen screw (4+6)
3. Remove the pilot (7)
4. Pull out the piston (8) with the spring (9) and remove the travel stop (5).
5. Re-insert the piston (8) and spring (9) upside down and reassemble the module in the reverse order.
6. Functional check



### 3.3.0 Modifying the GMQ 20 to double-acting

1. Loosen screws (1+2) and remove the gripper (3).
2. Loosen screws (6) and remove the pilot (7).
3. Pull the spring (9).
4. Remount the pilot (7) with the countersunk screws (6).
5. Remount the gripper (3).
6. Functional check

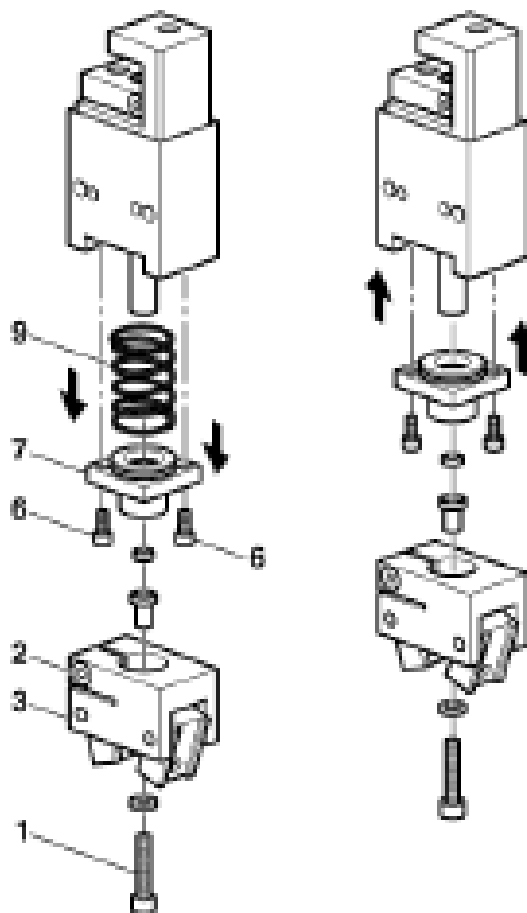
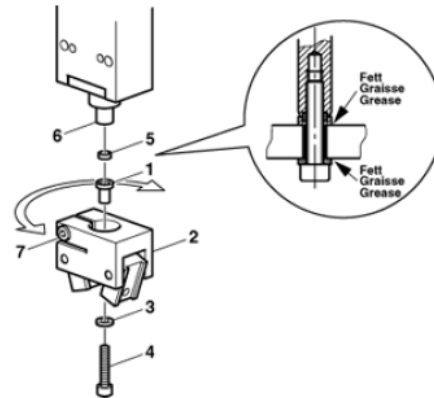


Fig.37

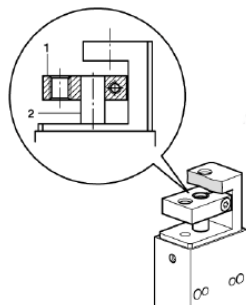
### 3.3.1 Mounting of the gripper

1. Centering ring (5) in piston rod (6) introduce.
2. Centering bushings (1) on centering ring (5) positioning.
3. Centering bushings (1) rich and insert gripper (2)
4. Gripper (2) with screw (4) and greased disc (3) on piston rod (6) of the gripper module screw.
5. Screw (7) tighten the gripper.
6. Functional check



### 3.3.2 Stroke adjustment on the gripper GMQ 20

The gripper stroke can only be set on module GMQ. If the GMQ has been modified to inner tension or the spring removed, then the stroke stop (1) must be reconnected securely and flush to the piston rod (2).

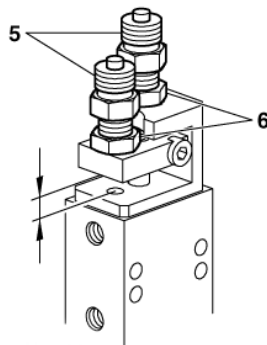


### 3.3.3 Adjustment the stop screw

The GM 12 can be equipped with a wide variety of stop screws. These must be ordered separately. (see catalog technical).

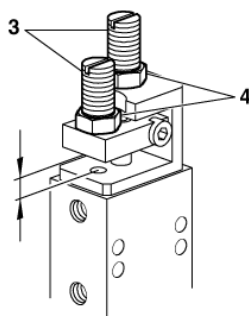
### 3.3.4 Adjusting stop screw AS 08/15

These stop screws can be combined with a proximity switch holder and proximity switch  $\varnothing$  6.5 mm or with an angle proximity switch holder and 8x8 mm proximity switch for end of travel interrogation.



1. Set the stroke by adjusting the stop screw (5).
2. Secure the stop screw with counternut (6), (stopping accuracy  $\pm 0,01$ mm).

### 3.3.5 Adjusting stop pin M8x1/25

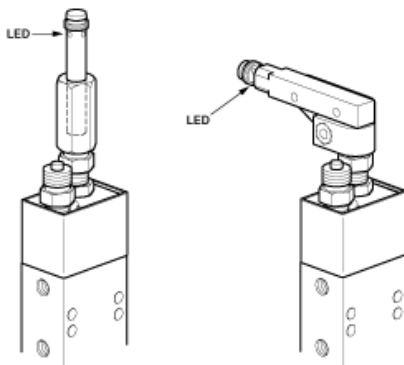


1. Set the stroke by adjusting the stop pin (3).
2. Secure the stop pin with counternut (4), (stopping accuracy  $\pm 0,01$  mm)

### 3.3.6 Adjusting the proximity switch

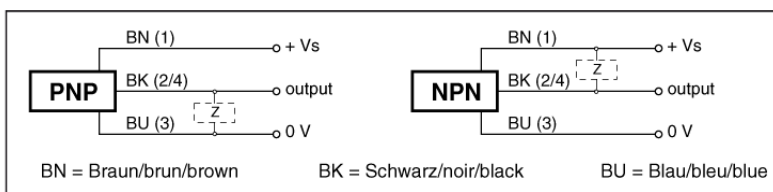
Plug-in and screw-in Ø 65 mm or 8x8 mm proximity switch holders are used for interrogation of the end of travel.

<b>CAUTION</b>	
	<b>GMs and proximity switch must not be used in an explosive environment!</b>



<b>NOTE</b>	
	Proximity switches and holders are not included in the GM scope of delivery.

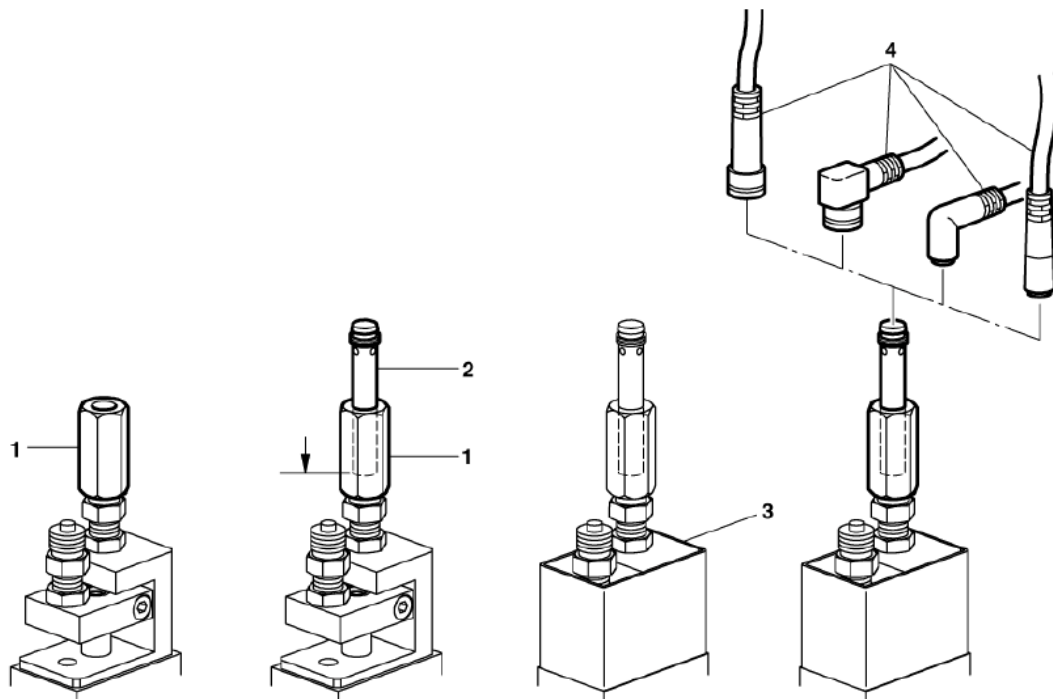
<b>CAUTION</b>	
	<p>The proximity switches can only be used with series AS stop screws.</p> <p>Depending on the type of control, switch type PNP or NPN should be defined. An LED on the proximity switch serves function monitoring on end of travel interrogation. If the LED does not change its switching condition on end of travel interrogation, then the proximity switch is faulty and must be replaced!</p>



**Technical data**  
 Operating voltage range 10-30 VDC  
 Switching interval 1,5 mm



### 3.3.7 Montage Proximity switch 6,5 mm GMQ 20

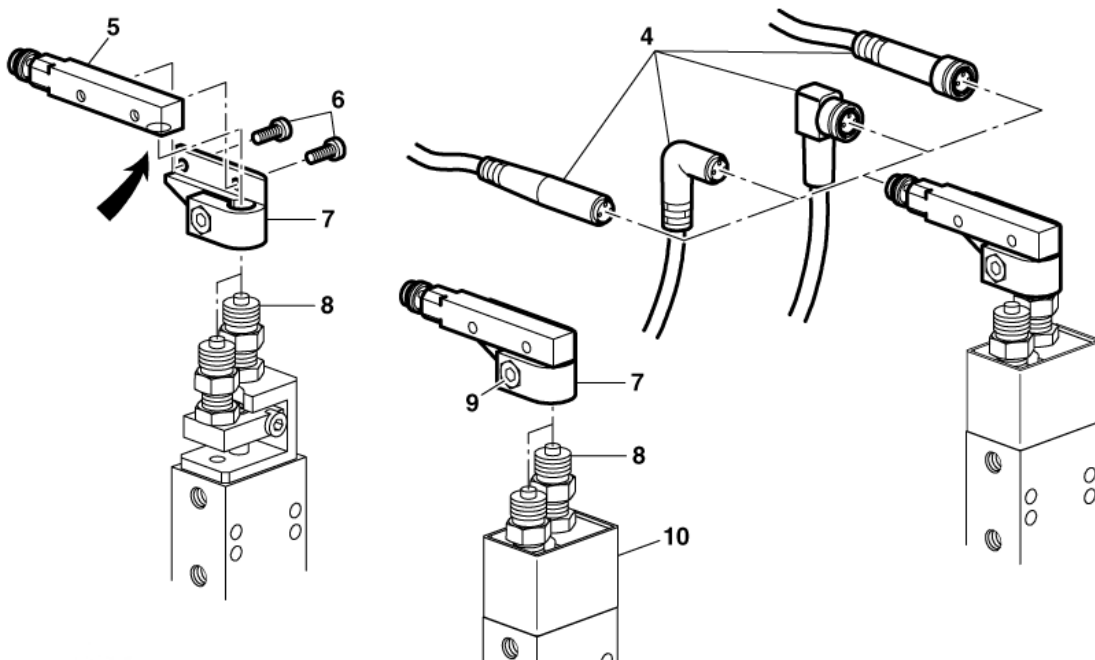
1. Screw the proximity switch holder (1) onto the stop screw.
2. Plug the proximity switch (2) as far as it will go into the proximity switch holder
3. Slightly tighten the proximity switch holder (1).
4. Mount the cover (3).
5. Mount the plug (4).
6. Functional check.



### 3.3.8 Mounting proximity switch 8x8 mm for GMQ 20 (GMQ 20/RM16/25)

1. Screw the proximity switch (5) onto the proximity switch holder (7) with screws (6).
2. Mount the cover (10)
3. Plug the proximity switch holder (7) with proximity switch as far as it will go onto the stop screw (8) and lock with screw (9).
4. Mount the plug (4)
5. Functional check.

 <b>CAUTION</b>	
	<b>The switching point of the proximity switch must cover the drill hole of the proximity switch holder! (see arrow)</b>





### 3.3.9 Preparation for start-up

Before you start the shock absorber and the stop screw so that the proposed rotation-stroke is damped properly.

### 3.4.0 Start-up of the GM 12 (GM 12/RM 12)

- Aerate the total system slowly.
- Pay attention to the permissible values (technical data) regarding:
  - load capacity
  - motion frequency
  - moment loads on the guide system



 <b>CAUTION</b>	
	<b>Limbs may be squeezed by moving components.</b>

- Make sure that there are no persons or tools within the operating range of the module.
- Carry out a test run
  - at first at slow traverse speed,
  - afterwards under operating conditions.



## 4.0.0 Maintenance Instructions

### 4.1.0 Maintenance and servicing

 <b>CAUTION</b>	
	<p><b>The module may only be disassembled when the system is aerated and deactivated. If pneumatic connections are disconnected when they are under pressure, this may result in serious personal injury due to fast movements of moving parts.</b></p>

Maintenance interval	Service measures
As required	<ul style="list-style-type: none"> <li>▪ Clean the module with a dry, lint-free cloth. The module must not be washed down; do not use any aggressive cleaners.</li> </ul>
1 Montly	<ul style="list-style-type: none"> <li>▪ Check the safety labels for damage, readability and cleunless.</li> </ul>

#### Further maintenance

Under the following conditions is the GM gripper and GM/RM rotary gripper module maintenance free:

- Clean workshop atmosphere
- No splash water
- No dust and fumes caused by abraision or processes
- Ambient conditions according the Maintenance Instructions

### 4.1.1 Servicing

The GM gripper and GM/RM rotary gripper module is lubricated for-life and can be operated with oiled and unoiled air.

 <b>CAUTION</b>	
	<b>Never operate the GM gripper and GM/RM rotary gripper module with unoiled air after it was operated with oiled air!</b>

#### Air characteristics:

- Dry (free from condensation water)
- Filtered (40µm filter for oiled air)
- Filtered (5µm filter for unoiled air)

If the GM gripper and GM/RM rotary gripper module is operated with oiled air, the oil types listed below should be used:


- Festo special oil
- Avia Avilub RSL 10
- BP Energol HPL 10
- Esso Spinesso 10
- Shell Tellus Oil C 10
- Mobil DTE 21
- Blaser Blasol 154

Oil quantity: 5 – 10 oil drops per 1000 l air

Viscosity range:

9 to 11 mm<sup>2</sup>/s (= cST) at 40°C, ISO-class VG 10 according to ISO 3448

Apart from the usual cleaning work no further maintenance measures are required.

<b>NOTE</b>	
	<p>Module inserts for ionized air environments (e.g. in case of high-voltage procedures such as corona processes)</p> <p>Open guides and piston rods should be covered with a grease layer to avoid formation of rust.</p> <p>Afag standard greasing:   - Staburax NBU8EP (flat guides)                                          - Blasolube 301 (piston rods)</p>

#### 4.1.2 Trouble-shooting GMK 20 / GMQ 20 and GMQ 20/RM 16/25

Defective components are only to be replaced by Afag original spare parts.

[www.afag.com](http://www.afag.com)

Fault	Possible cause	Fault clearance
<b>Gripper opens does not close</b>	Compressed air is missing	Check over the connections
	Module pneumatically connected incorrectly	Check connections
<b>End position does not exist</b>	Stop screw incorrectly adjusted	Stop screw adjust
	Proximity switch defective	Proximity switch exchange
	Open circuit in the sensor cable	Initiator replace cable
<b>Hard gripping the workpiece</b>	Defective exhaust valve	Replace exhaust valve
	Gripper speed too high	Adjust exhaust valve
<b>Gripper cannot grasp the part, or lose it.</b>	Mass of the workpiece is too high	Greater use gripper type
	Cross point of the gripper tongs too far except of	Pressure shift inward
	Construction of the gripper fingers non-optimal	Construction customize (engage positifely)
<b>Grip strength to high Low</b>	-maximum gripper force	Pneumatic + spring action = gripping force safety
	-mean grip strength	Only pneumatic
	-slightest grip force	only spring action



### 4.1.3 Accessories GMK 20 / GMQ 20

Description	Article No.
Stop screw AS 08/15	11011202 see technical cat.
Stop screw AS 08/25	11004991
Centering pin	11009229
Shock absorber	11004990
Proximity switch INI d6.5x44-Sn1.5-PNP-NO-M8x1	11005439
Proximity switch INI8x8x38.5-Sn2.0-PNP-NO-M8x1	50338170




#### 4.1.4 Disassembly and repair

When the module is damaged it can be returned to Afag AG for repair.

 <b>CAUTION</b>	
	<p><b>The module may only be disassembled when the system is ventilated and deactivated. If pneumatic connections are disconnected when they are under pressure, this may result in serious personal injury owing to fast movements of moving parts.</b></p>


#### When can the modules be repaired by the customer?

Wearing parts can be exchanged by the customer itself when the warranty has expired.

<b>NOTE</b>	
	<p>All the other faulty parts must exclusively be replaced by company Afag AG!</p>

#### When the customer detects that the respective module is still under warranty:

- He returns the module to company Afag AG for repair.
- If the warranty has already expired, the customer must decide whether he repairs the module himself and orders the wearing parts kit or whether he returns the module to company Afag AG for repair.

<b>NOTE</b>	
	<p>The Afag offers a reliable repair service. Note that Afag no warranty of modules can take over what the company does not furch Afag Automation AG have been repaired.</p>

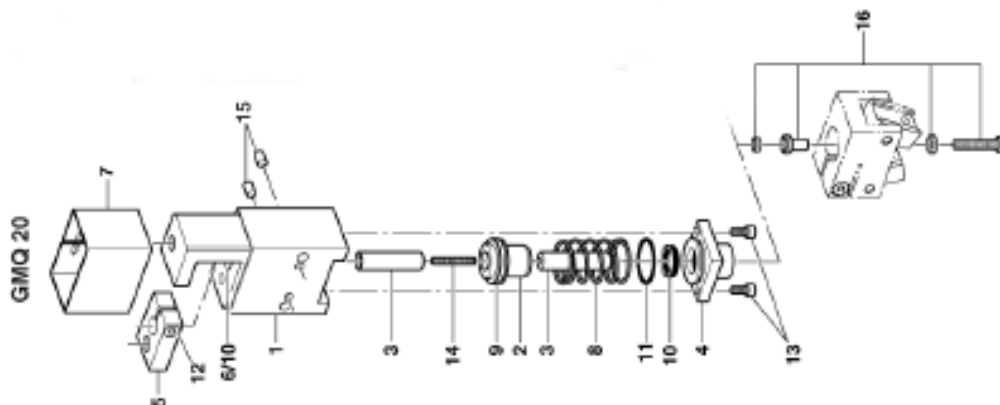
#### 4.1.5 Spare parts for GMQ 20

Pos	Spare parts	Dimensions	Supplier	Qty.	Order No.
1	Housing		Afag	1	11009183
2	Piston		Afag	1	11009080
3	Rod		Afag	2	11009081
4	Pilot		Afag	1	11009082
5	Travel stop		Afag	1	11009085
6	Bearing bush		Afag	1	11009086
7	Protection		Afag	1	11009087
8	<b>Compression spring</b>		<b>Afag</b>	<b>1</b>	<b>11009084</b>
9	<b>Piston packing</b>		<b>Afag</b>	<b>1</b>	<b>11000893</b>
10	<b>Rod packing</b>		<b>Afag</b>	<b>2</b>	<b>11009072</b>
11	O-Ring	D 18x1.5 mm	Afag	1	11009073
12	Screw cyl..In-6kt	M4 x 16 mm	Afag	1	11000402
13	Screw cyl. In-6kt	M3 x 8 mm	Afag	2	11000394
14	Setscrew In-6kt	M4 x 25 mm	Afag	1	11010944
14	Centering pin	D 4 x 6 mm	Afag	2	11005017
14	Gripper fastening set		Afag	1	

#### Expendable parts

- **Expendable parts-set for GMQ 20** , Article No. 11002505
- Set-Positionen 8,9,10

When the switch expendable parts, we recommend them all expendable parts simultaneously and carefully replaced so that the functional parts are not damaged.



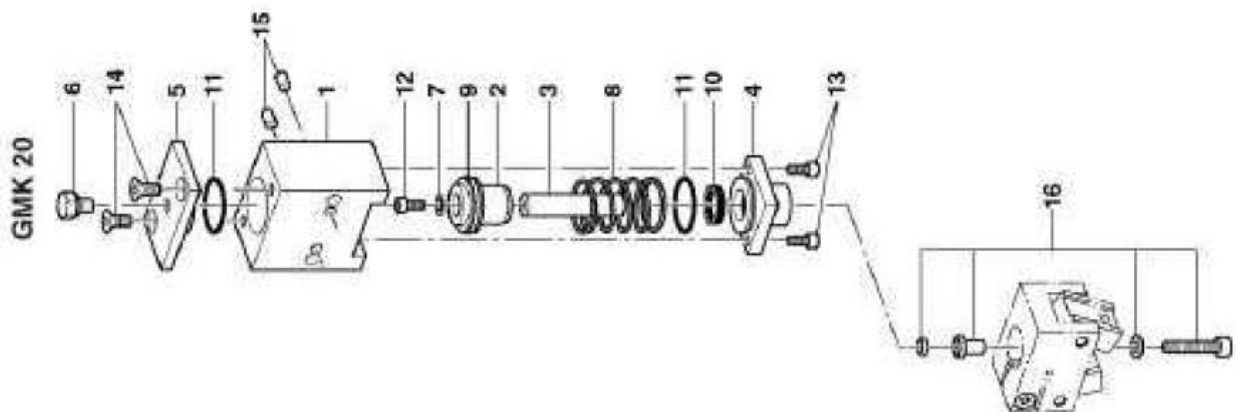
#### 4.1.6 Spare parts for GMK 20

Pos	Description	Dimension	Supplier	Qty.	Order No.
1	Housing		Afag	1	11009079
2	Piston		Afag	1	11009080
3	Rod		Afag	1	11009081
4	Pilot		Afag	1	11009082
5	Housing cover		Afag	1	11009083
6	Thread plug			1	11007119
7	Ribbed washer	M4		1	11000647
8	Compression spring		Afag	1	11009084
<b>9</b>	<b>Piston packing</b>			<b>1</b>	<b>11000893</b>
<b>10</b>	<b>Rod packing</b>			<b>1</b>	<b>11009072</b>
<b>11</b>	<b>O-Ring</b>	<b>D 18x1.5 mm</b>		<b>2</b>	<b>11009073</b>
12	Screw cyl.. IN-6kt.	M4 x 14 mm		1	11000401
13	Srew cyl. In-6kt.	M3 x 8 mm		2	11000394
14	Gew. Sti. In-6kt	M4 x 10mm		2	11010326
14	Centering pin	D 4 x 6 mm		2	11005017
14	Gripper fastening-set		Afag	1	11015011

#### Expendable parts

- **Expendable parts–Set for GMK 20; Article No.: 11002505** (Pos. 9,10,11)

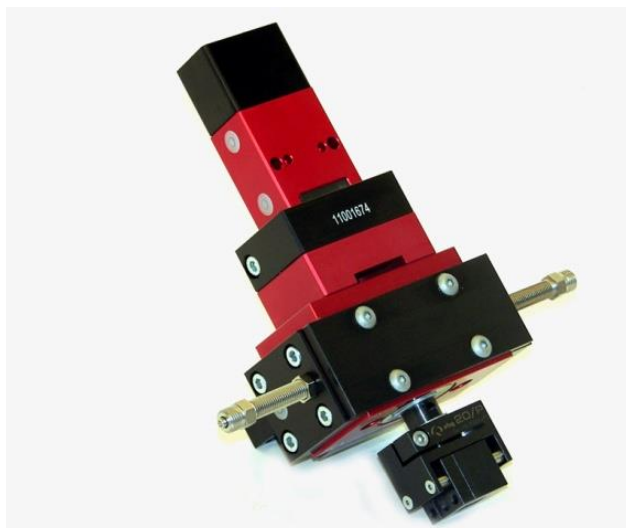
When the switch expendable parts, we recommend them all expendable parts simultaneously and carefully replaced so that the functional parts are not damaged.



#### 4.1.7 Rotary Gripper Module GMQ 20/RM 16/25

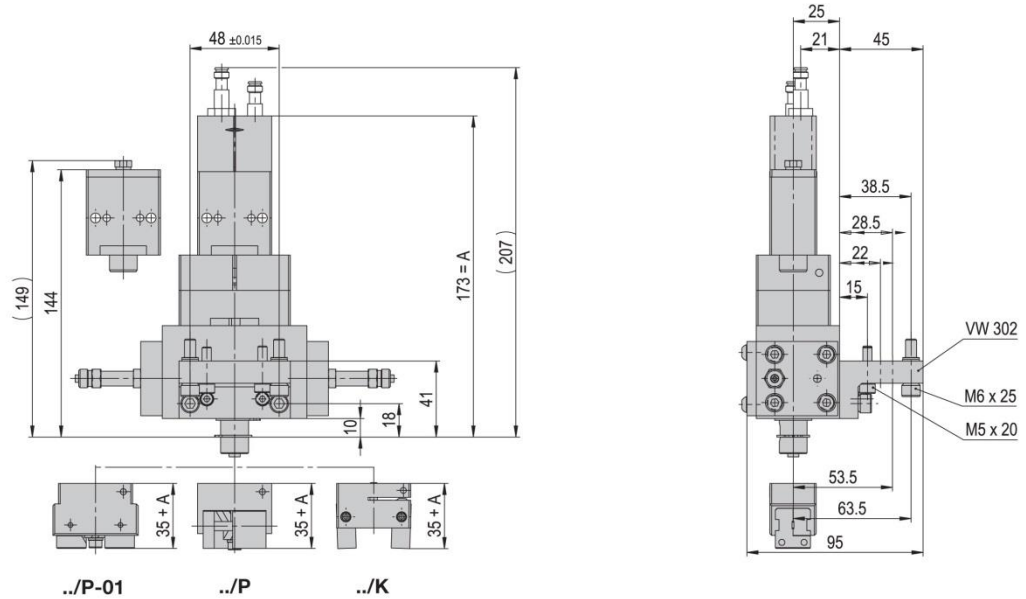
You can put together our gripper rotary module complete with the desired gripper tongs at Afag Automation AG.

Detailed information can be found in our handling catalog or WEB.





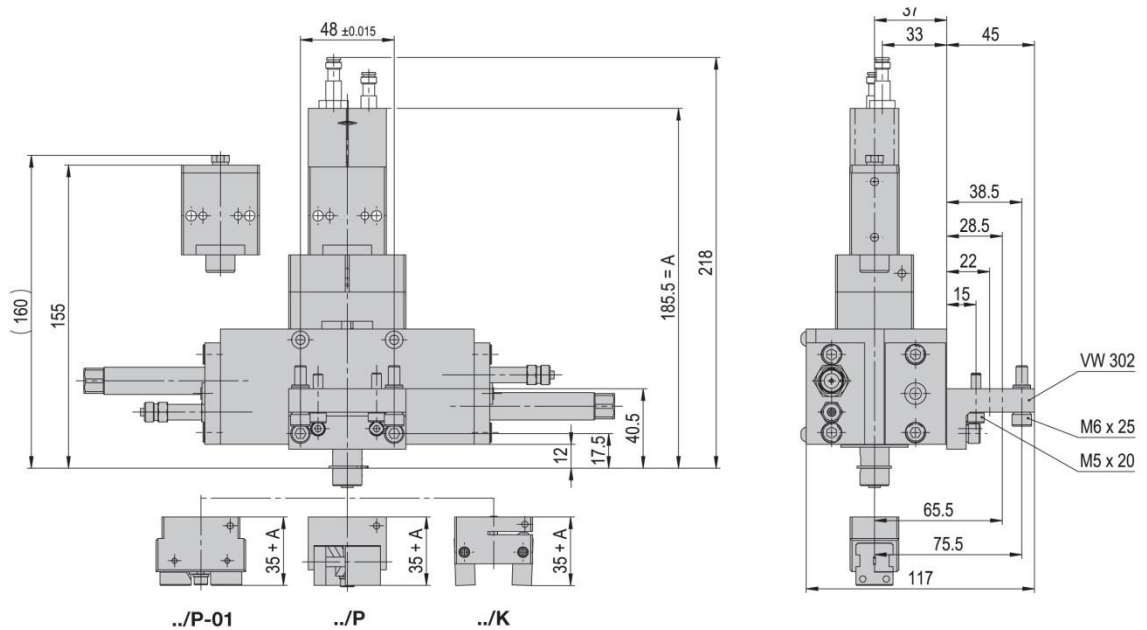
### 4.1.8 Dimensions drawing GMQ 20 /RM16/25



#### GMQ 20 /RM 16

Greifantrieb hinten  
Vérin de commande en arrière  
Gripper actuator in the back

Drehmoment / Couple de rotation / Torque: 0.6 Nm (6 bar)







#### GMQ 20 /RM 25

Greifantrieb hinten  
Vérin de commande en arrière  
Gripper actuator in the back

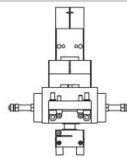
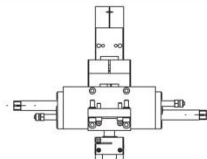
Drehmoment / Couple de rotation / Torque: 2.5 Nm (6 bar)

## 4.1.9 Product overview GMQ 20 /RM 16/25

Greifantrieb Vérin de commande Gripper actuator	<b>GMQ 20</b>		
			
Greifzange Pince Gripper	<b>..P-01</b>	<b>..P</b>	<b>..K</b>
			



**Greif-Drehmodule**  
Module de préhension rotatif  
Rotary gripper modules

Lage des Greifantriebs Position du vérin de commande Position of gripper actuator	Rotationsmodule Module de rotation Rotary module	Bestellnummer Article No. Order No.		
hinten en arrière in the back 	<b>RM 16</b>	50410319	50094775	50094784
	<b>RM 16 SD</b>	50410320	50094776	50094785
	<b>RMZ 16</b>	50410321	50094778	50094787
	<b>RMZ 16/2</b>	50410322	50094779	50094790
hinten en arrière in the back 	<b>RM 25</b>	50410323	50094795	50094801
	<b>RMZ 25/1</b>	50410324	50094796	50094802
	<b>RMZ 25/2</b>	50410325	50094797	50094803

Modulgewicht Poids du module Weight of module	<b>RM 16</b>	<b>RM 16 SD</b>	<b>RMZ 16</b>	<b>RMZ 16/2</b>	<b>RM 25</b>	<b>RMZ 25/1</b>	<b>RMZ 25/2</b>
	1.602 kg	1.672 kg	1.862 kg	2.022 kg	2.853 kg	3.503 kg	3.573 kg
	1.649 kg	1.719 kg	1.909 kg	2.069 kg	2.900 kg	3.550 kg	3.620 kg
	1.568 kg	1.638 kg	1.828 kg	1.988 kg	2.819 kg	3.469 kg	3.539 kg

**Im Lieferumfang inbegriffen:**

- 1 Montagewinkel
- 2 Montageschrauben M6x25
- 2 Montageschrauben M5x20
- 2 Rippenscheiben M6
- 2 Rippenscheiben M5
- 2 Zentrierhülsen 9x4 mm

**La livraison comprend:**

- 1 Equerre de fixation
- 2 Vis montage M6x25
- 2 Vis montage M5x20
- 2 Disque côte M6
- 2 Disque côte M5
- 2 Douille de centrage 9x4 mm

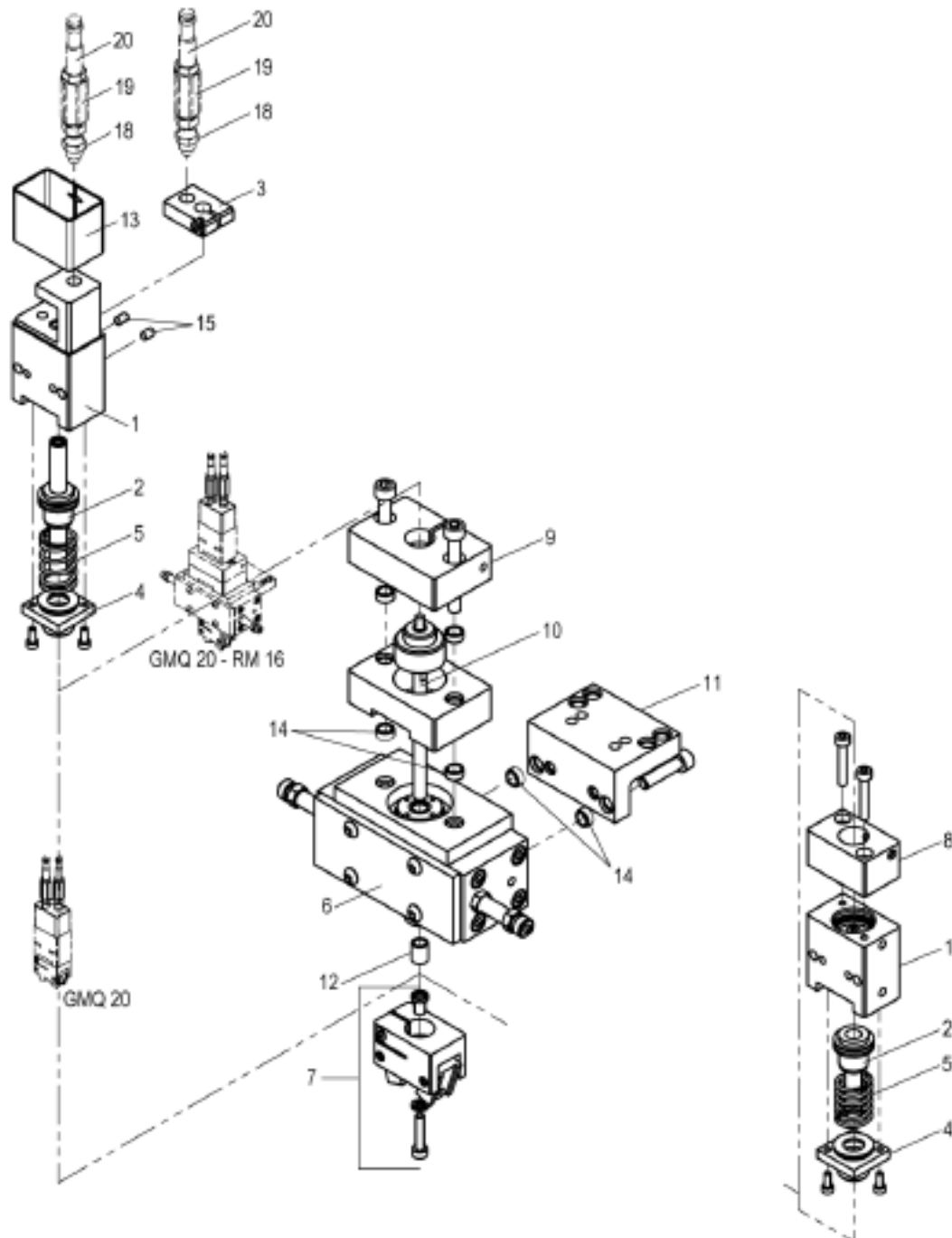
**Included in the delivery:**

- 1 L-bar assembly
- 2 Mounting screw M6x25
- 2 Mounting screw M5x20
- 2 Rip. disk M6
- 2 Rip. disk M5
- 2 Centering bushing 9x4 mm

#### 4.2.0 Parts drawing GMQ 20- RM 16/25

The gripper module series GMQ can also Afag with rotary gripper modules of the RM 16 and RM 25 series fit together.

#### GMQ20 / GMQ 20-RM 16 / RM 25



#### 4.2.1 Accessories RM 16/25

##### RM 16

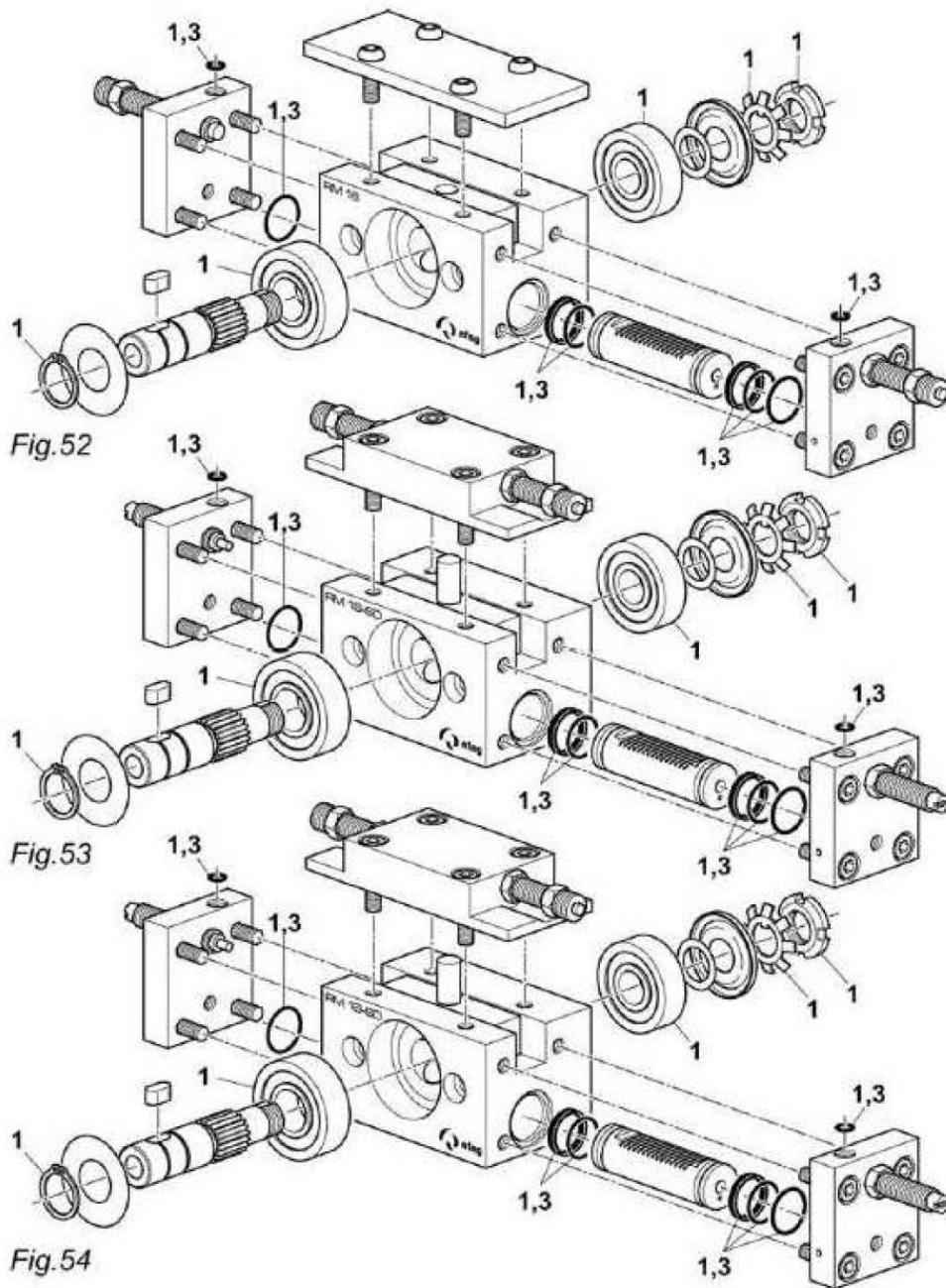
<b>Description</b>	<b>Order No.</b>
Torque amplifier RM 16	11011676
Cylinder intermediate position RM 16	11001670
Cylinder intermediate position RMZ 16/360°	11015776
Accessories intermediate position for RM 16	11001680
Accessories shock absorber for RM 16	11001683
Mounting screw M6x56	11005015
Proximity switch INI 6.5x44-Sn1.5-PNP-NO-M8x1	11005439
Proximity switch INI 8x8x38.5-Sn2.0-PNP-NO-M8x1	50338170

##### RM 25

<b>Description</b>	<b>Order No.</b>
Mounting screw M6x56	11005015
Clamping support RM 16/ RM 25	11001672
Proximity switch INI 6.5x44-Sn1.5-PNP-NO-M8x1	11005439
Proximity switch INI 8x8x38.5-S-2.0-PNP-NO-M8x1	50338170

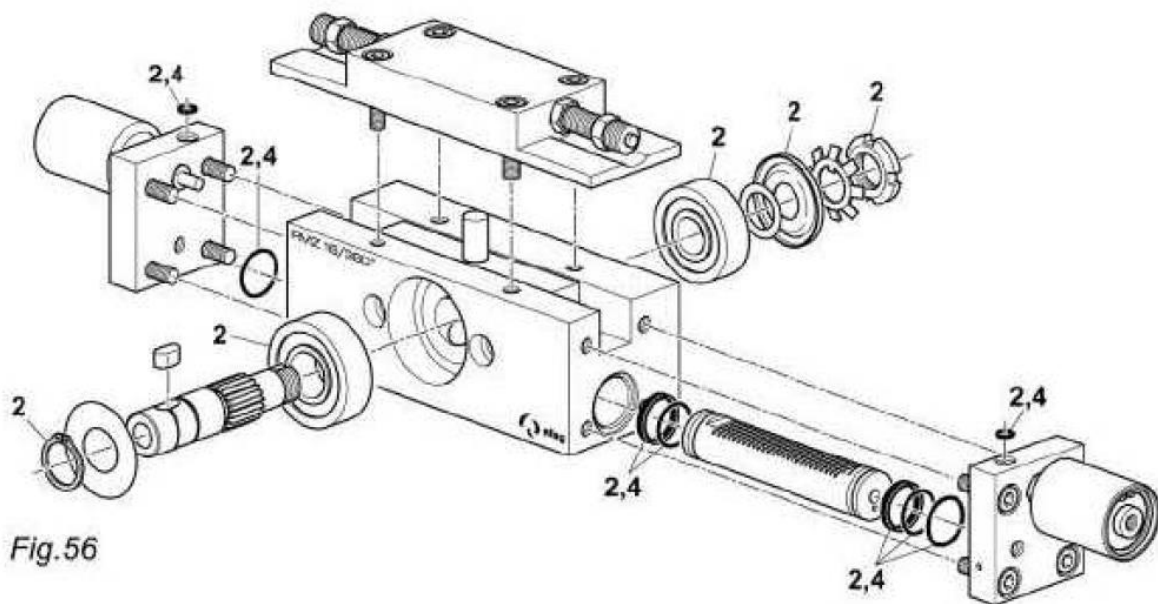
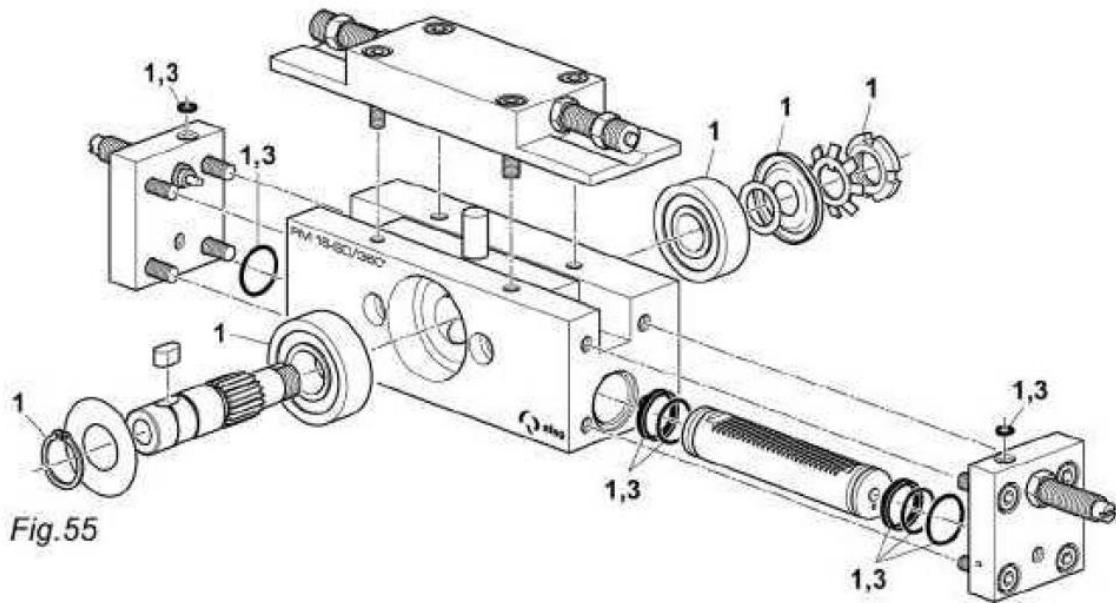
### 4.2.2 Spare parts RM 16

Pos	Description	Dimension	Supplier	Nom.	Order No.
1	Expendable parts		Afag	1	11002514
2	Expendable parts		Afag	1	11007844



### 4.2.3 Spare parts RM 16/360°

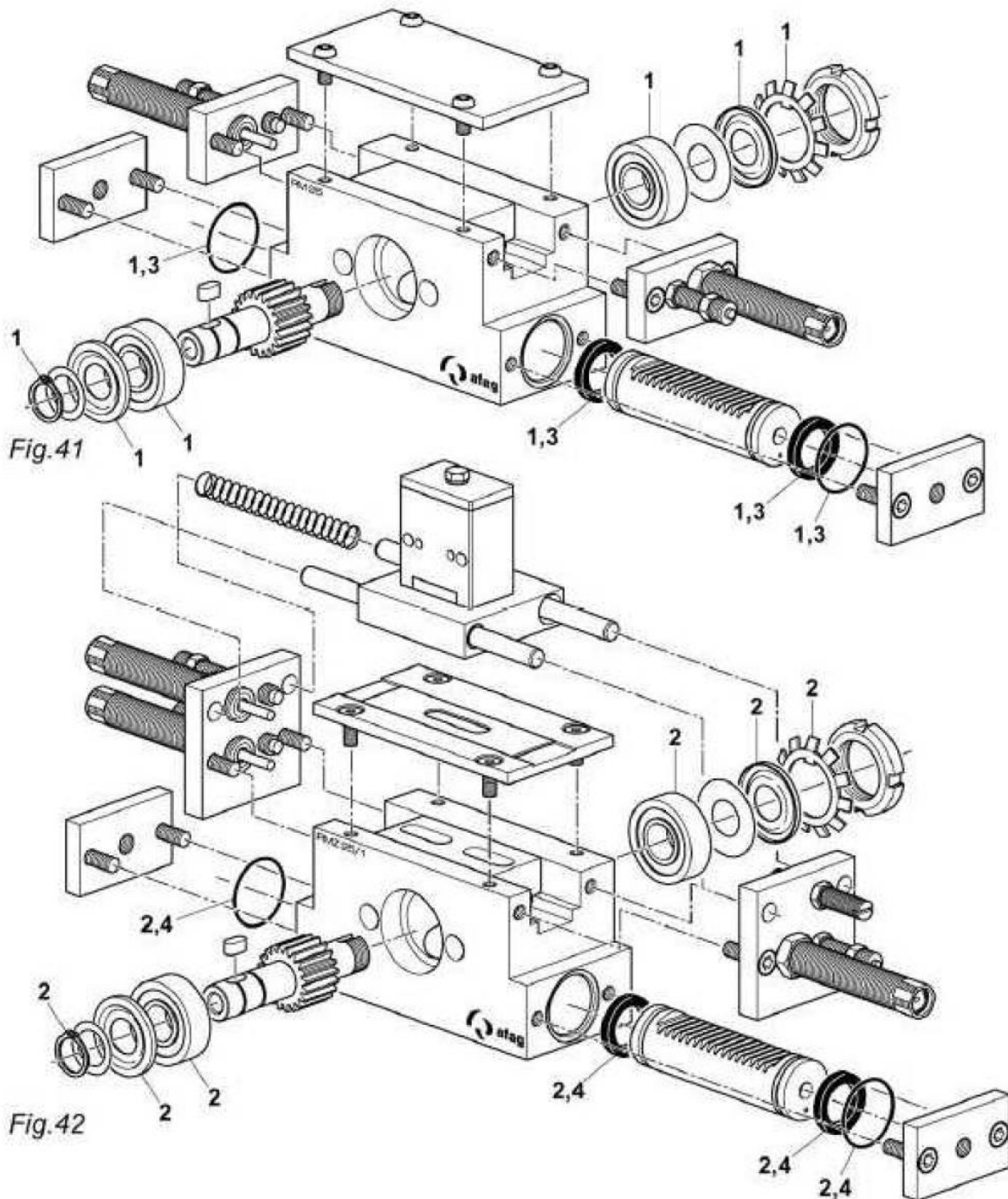
Pos	Description	Dimension	Supplier	Nom.	Order No.
1	Expendable parts		Afag	1	11002514
2	Expendable parts		Afag	1	11007844





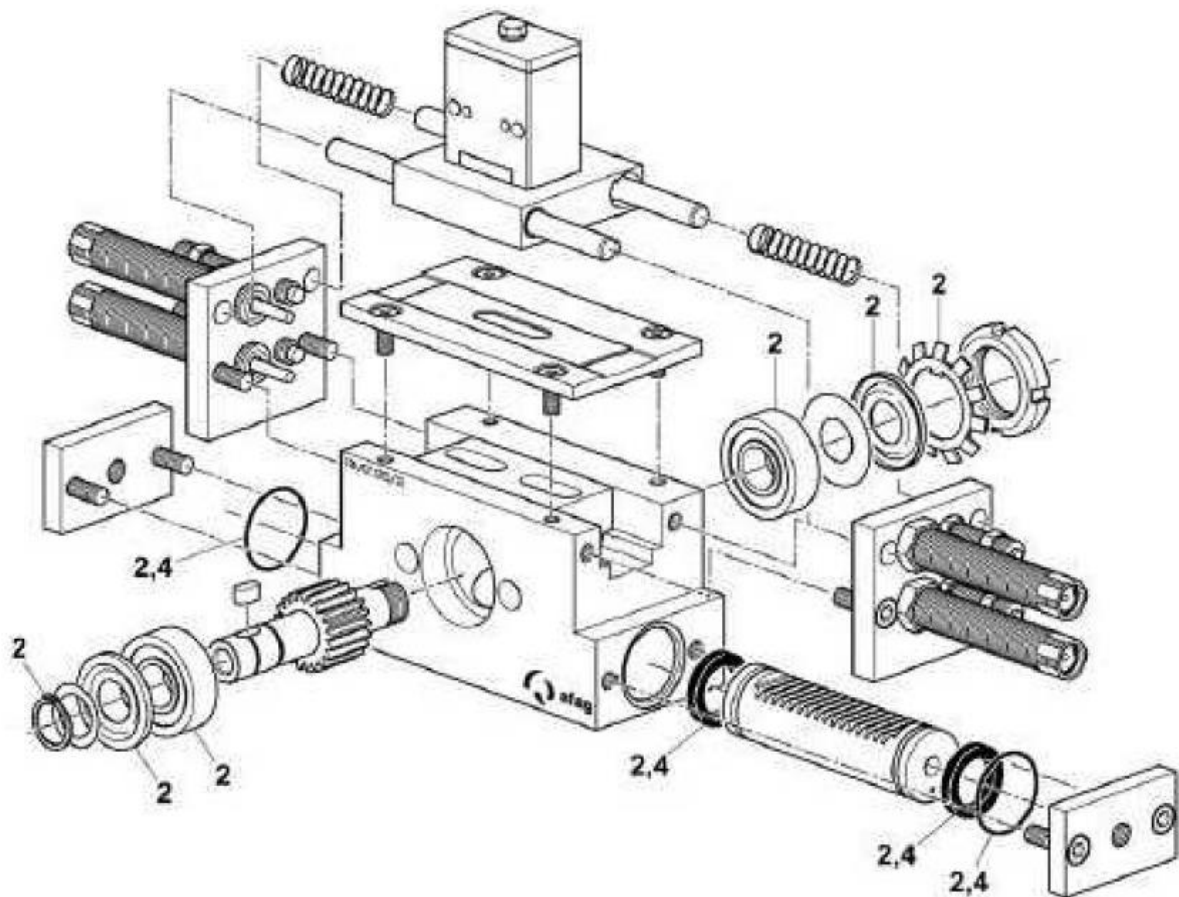
#### 4.2.4 Spare parts RM 25 / RMZ 25/1

Pos	Description	Dimension	Supplier	Nom.	Order No.
1	Expendable parts		Afag	1	11002517
2	Expendable parts		Afag	1	11002519




#### 4.2.5 Expendable parts RMZ 25/2

Pos	Description	Dimension	Supplier	Nom.	Order No.
1	Expendable parts		Afag	1	11002519





## 5.0.0 Disposal

NOTE	
	<p>GM's and RM's which are of no further use should not be disposed to fas a complete unit but dismantled into individual parts according to the type of material and recycled should be correctly disposed of.</p> <p>Non-recyclable materials, animal waste.</p>





