

Rotary modules Electrical

RME-080-4.5 / RME-080-4.5-GMQ 12

- Declaration of Incorporation
- Assembly Instructions
- Operating Instructions
- Maintenance Instructions



„Translation“ of the Original Operating Instruction
© Copyright by Afag Automation AG



These operating instructions apply to:

| |
|--|
| |
|--|

| Type | Order No. |
|-----------------------------|-----------|
| RME-080-4.5 (sans flasques) | 50001300 |
| RME-080-4.5 (avec flasques) | 50002809 |
| RME-080-4.5-GMQ 12/P | 50004060 |
| RME-080-4.5-GMQ 12/PS | 50004064 |
| RME-080-4.5-GMQ 12/K | 50004063 |
| RME-080-4.5-GMQ 12/P01 | 50004062 |

Version of this documentation: RME-080-4.6-GMQ 12-OI-vers. 3.2 gb. 24.01.12.doc

Symbols: Assembly and initial start-up must be carried out by qualified Personnel only and according to these operating instructions.

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

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


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

Table of contents:

| | |
|---|----------------|
| 1.0.0 Declaration of Incorporation | Side 5 |
| 1.1.0 Declaration of Incorporation according to the machinery Directive 2006/42/EG | Side 5 |
| 2.0.0 Assembly Instructions | Side 6 |
| 2.1.0 Transport and storage (packing and unpacking) | Side 6 |
| 2.1.1 Mounting of the module | Side 7 |
| 2.1.2 Tighten torques for screws | Side 8 |
| 2.1.3 Performance-Diagramme | Side 9 |
| 2.1.4 Preferred combinations RME | Side 9 |
| 3.0.0 Operating Instructions | Side 10 |
| 3.1.0 Manufacturer address | Side 10 |
| 3.1.1 These operating instructions apply to | Side 11 |
| 3.1.2 General description / Safety Information | Side 12 |
| 3.1.3 Description the module | Side 13 |
| 3.1.4 Part name | Side 14 |
| 3.1.5 Includes in the delivery | Side 15 |
| 3.1.6 Guarantee | Side 15 |
| 3.1.7 Intended use | Side 15 |
| 3.1.8 Dimensions RME-080-4.5 without flange | Side 16 |
| 3.1.9 Dimensions RME-080-4.5 with flange | Side 16 |
| 3.2.0 Technical data | Side 17 |
| 3.2.1 Interfaces electrical | Side 18 |
| 3.2.2 Limit Sensor connecting (A) | Side 18 |
| 3.2.3 Limit Sensor connecting (B) | Side 19 |
| 3.2.4 Encoder connection | Side 19 |
| 3.2.5 Mounting of the Limit stop | Side 20 |
| 3.2.6 Installation | Side 21 |
| 3.2.7 Connection electrical | Side 22 |
| 3.2.8 First Operation | Side 23 |
| 3.2.9 Functional Inspection | Side 24 |
| 3.3.0 Start-up (Reference action) | Side 25 |
| 3.3.1 Programming | Side 25 |
| 3.3.2 Rotary gripper module (Assembly of the mechanical stop) | Side 26 |

| | |
|---------------------------------------|----------------|
| 4.0.0 Maintenance Instruction | Side 27 |
| 4.1.0 Maintenance and servicing | Side 27 |
| 4.1.1 Safety stickers | Side 28 |
| 4.1.2 Possible failures | Side 29 |
| 4.1.3 Malfunctions during operation | Side 30 |
| 4.1.4 Fault elimination | Side 31 |
| 4.1.5 Replacement of the toothed belt | Side 31 |
| 4.1.6 Replacement of the toothed belt | Side 33 |
| 4.1.7 Replacement of toothed belt | Side 34 |
| 4.1.8 Accessories | Side 35 |
| 4.1.9 Disassembly and repair | Side 36 |
| 5.0.0 Disposal | Side 37 |

1.0.0 Declaration Installation for the incomplete machine

1.1.0 Declaration Installation according to the EC Machinery 2006/42/EG, Appendix II B

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

Herewith declares that for the Partly Completed:

Description: **RME-Rotary module**
 Types: **RME-080-4.5, RME/GMQ 12**
 Sequential series: **Nr.50xxxxxx**

The following essential requirements of the Machinery Directive **2006/42/EG Appendix II B** are applied and fulfilled..

The incomplete machine further complies with the:

Applicable EC-Directives : Machinery Directive 2006/42/EG
EG Niederspannungsrichtlinie 2006/95//EG

Harmonized standards applied:

Specially : **EN ISO 12100-1; EN ISO 12100-2**
EN ISO 14121-1; EN 60204-1:2006

The relevant technical documentation is compiled in accordance with part of Annex V II and that this documentation or parts hereof will be transmitted by post or electronically in response to a reasoned request by the national authorities.

Name and address of the person authorised to compile the relevant technical documentation: **Lanz Beat, Afag Automation AG**

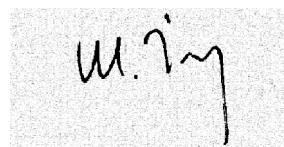
This partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive (2006/42/EC) where appropriate.

Place, Date **Manufacturer: Afag Automation AG**

Huttwil, 12. April. 2008

Name Vorname
Mathias Schütz

Name Vorname
Marc Zingg






Product manager
Afag Automation AG


Manager
Afag Automation AG

2.0.0 Assembly instructions

2.1.0 Transport and storage (packing and unpacking)

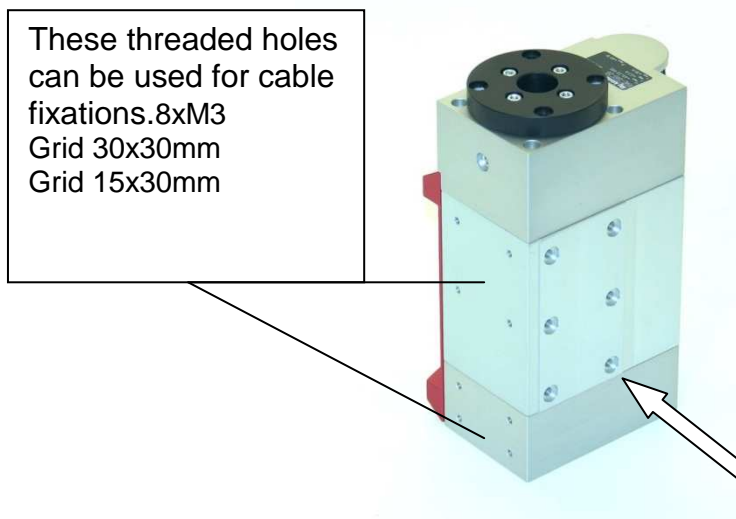
|  CAUTION | |
|--|--|
|  | <p>The RME module are not packed in a cardboard box, therefore, one should work with transport and with be careful, um to avoid damage in the modules. With wrong use the module could fall down and injure or squeeze feet /finger.</p> |



| NOTE | |
|---|--|
|  | <p>Attention!</p> <p>These operating instructions should be read carefully before carrying out any activity on or with the module. The module may only be deployed in accordance with the intended use.</p> |

2.1.1 Mounting of the module

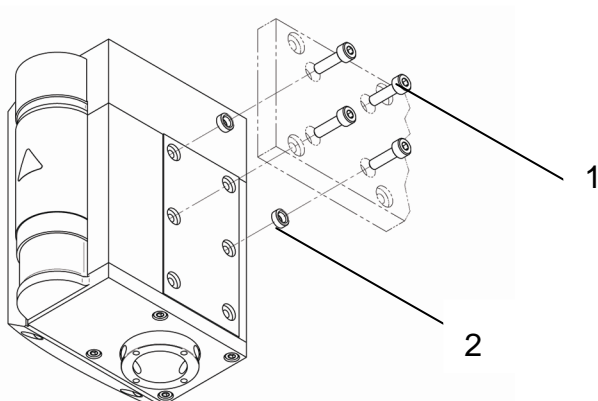
The mounting holes are on the back of the module (arrow), the rotary module can be installed in all positions.



| Hole matrix | Centering bushings |
|--------------------|--------------------|
| 30 x 30 mm, (6xM4) | Ø D 7x3 mm |

Mounting of the Module

1. If the system in which the module is to be installed is prepared for mounting with centering bushings, insert two centering bushings (2) into two diagonally opposite holes of the module.
2. Insert the module at the designated mounting position and fasten it with the mounting screws (1)
3. Attach further elements or useful loads to the module shaft.



1 *Mounting screws*

2 *Centering bushings*

2.1.2 Tighten torques for screws

7

The screw 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 |
| M 10 | 46,0 ... 49,0 Nm |
| M 12 | 70,0 ... 85,0 Nm |

[This is an incomplete machine](#)

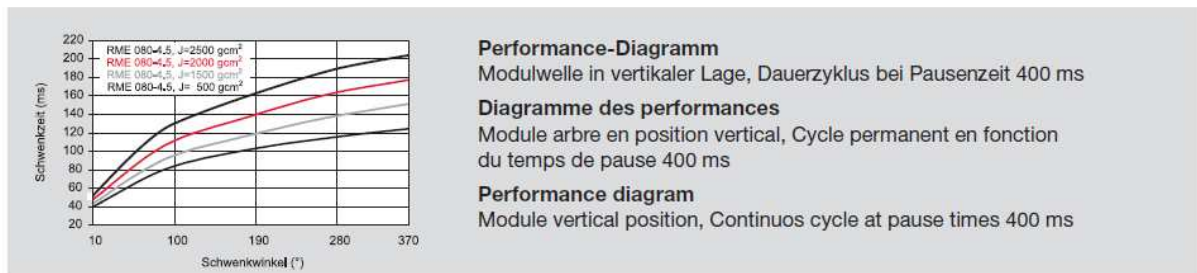
Assembly of the RME rotary module in a system

The series of the RME rotary module is used for the linear, smooth movement of rigidly mounted loads under the ambient and operating conditions defined for this module, see Technical data. The RM rotary module can be installed in the horizontal or vertical position.

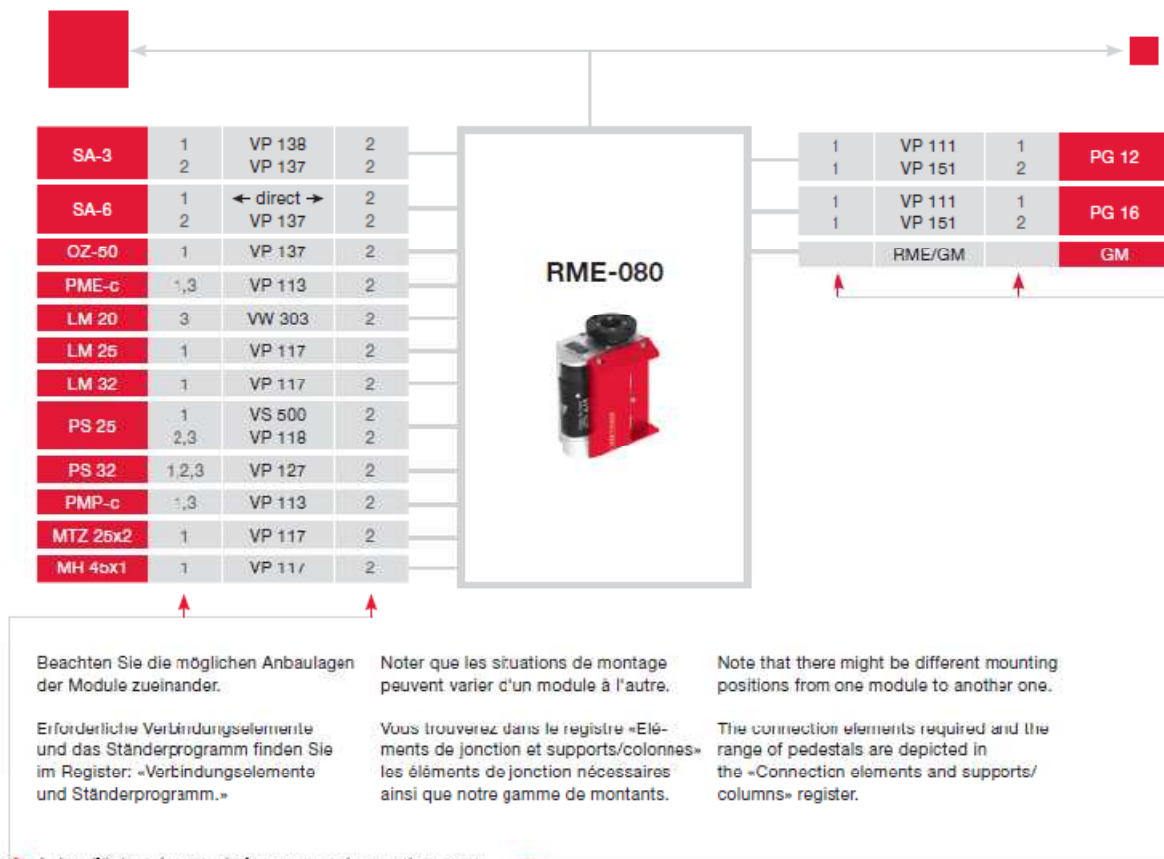
| NOTE | |
|---|---|
|  | <p>These operating instructions should be read carefully before carrying out any activity on or with the RM module. The RM module may only be deployed in accordance with the intended use.</p> |

| NOTE | |
|---|---|
|  | <p>Safety instructions</p> <p>Modifications on the RM rotary module that are not described in these operating 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> |

2.1.3 Performance-Diagramm



2.1.4 Preferred combinations RME-080



Anbauflächen / areas de la montage / mounting areas

| CS | PS | LM / LE | RM / RE | CR / RM32 / RME / RE | UG / GM / EG / SG / DG / PG |
|-------------|----|-------------|---------|----------------------|-----------------------------|
| | | | | | |
| PMP / PMP-c | SA | PME / PME-c | OZ | PEZ / PDZ | HM |
| | | | | | |

3.0.0 Operating instructions

3.1.0 Manufacturer address: Afag Automation AG
Fiechtenstrasse 32
CH-4950 Huttwil (Switzerland)

Sales Handling:
Tel. 0041 (0)62 959 87 02
www.afag.com

These operating instructions apply to:

Product name: **Rotary module** electrical
Typen: **RME-080; RME-GM 12**

This documentation was written according to:

The applicable EC-Directive 2006/42/EG

Responsible person for the documentation:

Lanz Beat, PM & Marketing-Services
Afag Automation AG
Fiechtenstrasse 32
4950 Huttwil

3.1.1 These operating instructions apply to:

| | |
|--------------------------|--|
| Typ: | |
| RME-Rotary modul: | |


Version of this documentation: RME-080-4.5-GMQ 12-OI-vers. 3.1 gb. 18.01.12.doc

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


 **WARNING**

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

 **CAUTION**

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

Usage Conformant with Intended Purpose

The series of the rotary modules RME-080-4.5 electrical rotates elements or useful loads that are mounted on the module shaft in non-explosion hazardous ambient and operating conditions that are suitable for this module; see catalogue.

The module can be mounted in any possible position.

Safety Instructions

These operating instructions should be read carefully before carrying out any activity on or with the module.

The module may only be deployed in accordance with the intended use.

Modifications on the module that are not described in these operating instructions or have not been approved in writing by Afag are not permitted. In case of inexpert changes or improper assembly, installation, operation, maintenance or repairs, Afag reflects all liability.

| | |
|---|--|
|  VORSICHT | |
|  | The voltages and currents applied may cause personal injuries and damage to property. |

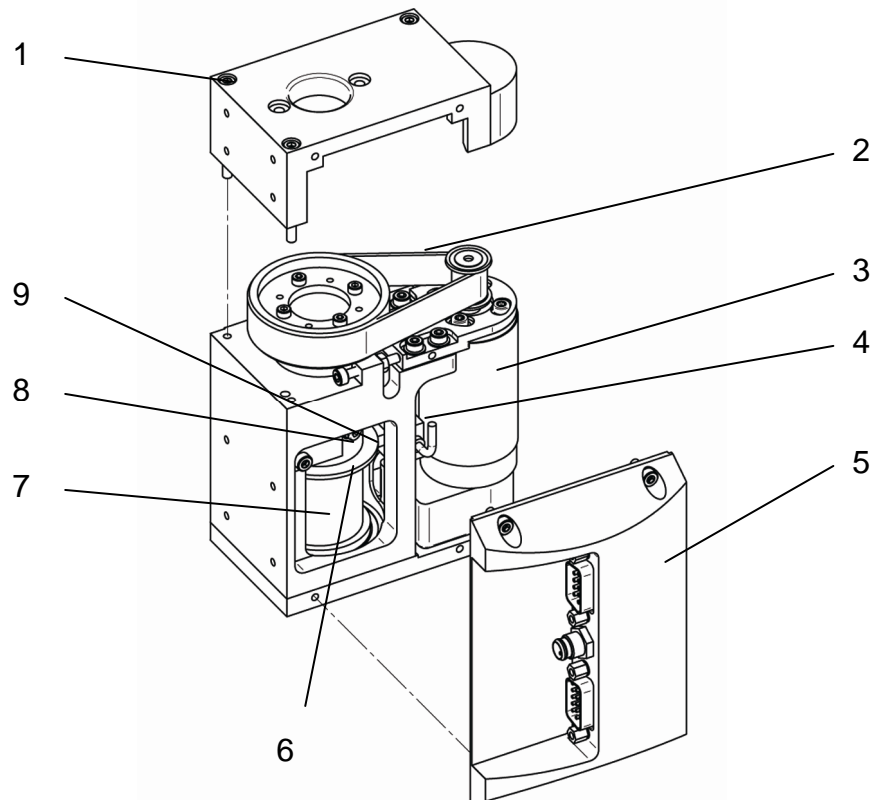
3.1.3 Description the modul

The rotary modules RME-080-4.5 is available as variant:

| Type | Limited angle of rotation |
|------------------------------|---------------------------|
| RME-080-4.5 (without flange) | 360° |
| RME-080-4.5 (with flange) | 360° |



3.1.4 Part name



- | | | | |
|---|---------------------|---|------------------------------------|
| 1 | <i>Cover, top</i> | 6 | <i>Module shaft ring</i> |
| 2 | <i>Toothed belt</i> | 7 | <i>Module shaft</i> |
| 3 | <i>Drive</i> | 8 | <i>Limit stop</i> |
| 4 | <i>Limit sensor</i> | 9 | <i>Groove in module shaft ring</i> |
| 5 | <i>Front cover</i> | | |

The rotary modules, electrical, rotates elements or useful loads that are mounted on the module shaft (7).

The servomotor of the drive (3) drives the module shaft via a toothed belt (2). The movement of the shaft is monitored by the encoder in the drive.

Make a reference run to move the shaft to the home position of the module. During the reference run the shaft is turned, until a limit sensor (4) responds. This is defined to be the home position of the module.

An optional limit stop (8) can limit the range of rotation to 320°.

The module is assembly by means of four of the six borings in the module housing. Further elements or useful loads can be attached to the module shaft.

3.1.5 Included in the delivery

| Number | Description |
|--------|--------------------------|
| 1 | Modul |
| 2 | Centering bushings Ø 7x3 |
| 1 | Screw for positive stop |

Intended use

The series of the rotary modules RME-080-4.5 electrical rotates elements or useful loads that are mounted on the module shaft in non-explosion hazardous ambient and operating conditions that are suitable for this module; see catalogue.

The module can be mounted in any possible position.

|  CAUTION | |
|--|---|
|  | The voltages and currents applied may cause personal injuries and damage to property. |


3.1.6 Gurantee

The module is designed for 40 million load alterations under the ambient conditions and conditions of deployment defined for this module, see catalogue. The guarantee includes the repair or replacement of faulty parts at Afag AG.

When repairs are carried out by the customer without prior training or instruction by Afag AG the warranty will become void. No additional claims can be entertained.

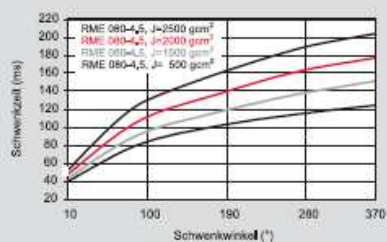
3.1.7 Intended use

The series of the RME rotary module is used for the rotary movement of rigidly mounted loads under the ambient and operating conditions defined for this module; see Technical catalogue.

| NOTE | |
|---|--|
|  | <p>These operating 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 operating 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> |

3.2.0 Technical data

| Typ | Type | Type | RME-080-4.5 ohne Flansch sans bride without flange | RME-080-4.5 mit Flansch avec bride with flange |
|---|---|---|--|---|
| Bestellnummer | Article No. | Order No. | 50001300 | 50002809 |
| Drehwinkel | Angle de rotation | Angle of rotation | n x 360° | n x 360° |
| Drehwinkelbegrenzung möglich | Lim. de l'angle de rotation impossible | Limited angle of rotation possible | 320° | 320° |
| Einbaulage | Position de montage | Installation position | ✦ | ✦ |
| Strom | Courant | Current | | |
| – Spitzenstrom | – Intensité (pointes) | – Peak current | 10.0 A | 10.0 A |
| – Dauerstrom | – Intensité (permanente) | – Permanent current | 2.41 A | 2.41 A |
| Nennmoment | Moment nominale | Nominal moment | 44.5 mNm | 44.5 mNm |
| Nennzahl | Régime de cosigne | Nominal speed | 9540 U/min | 9540 U/min |
| Anschlusswiderstand | Resistance de branchement | Connecting resistor | 1.33 Ohm | 1.33 Ohm |
| Anschlussinduktivität | Contact induction | Connection inductivity | 0.226 mH | 0.226 mH |
| Drehmomentkonstante | Moment de torsion constante | Torque constant | 20.5 mNm/A | 20.5 mNm/A |
| Rotorträgheitsmoment | Rotor moment d'inertie | Rotor moment of inertia | 20 gcm ² | 20 gcm ² |
| Digitaler Inkrementalgeber | Digital incremental | Digital incremental giver | RS422 | RS422 |
| Kanal | Canale | Canel | A,B,I/A,/B,/I | A,B,I/A,/B,/I |
| Auflösung (pro Motorumdrehung) | Dénoement de moteur tour | Dissolution de motor turn | 500 Inkr | 500 Inkr |
| Versorgungsspannung | Tension d'alimentation | Supply voltage | 5 VDC | 5 VDC |
| Wiederholgenauigkeit | Précision de répétition | Repeating precision | +/- 0.10° | +/- 0.10° |
| Modulgewicht | Poids du module | Weight of module | 0.98 kg | 1.02 kg |
| Max. zul. Massenträgheitsmoment der Nutzlast der bezüglich der Moduldrehachse | Moments d'inertie maximum autorisés pour la charge utile en fonction de l'axe de rotation du module | Maximum permissible mass moment of inertia of the useful load of the RME relating to the axis of rotation of the module | 2500 gcm ² | 2500 gcm ² |
| Max. Dauerdrehmoment | Mom. de torsion perm. max | Maximum permanent torque | 0.2 Nm | 0.2 Nm |
| Spitzendrehmoment | Mom. de torsion (pointe) | Peak torque | 0.6 Nm | 0.6 Nm |
| Dauerzahl | Permanente de tours | Permanent speed | 600 U/min. | 600 U/min. |
| Zul. Axialkraft stat. | Force axiale stat. autorisée | Permissible axial force static | 200 N | 200 N |
| Zul. Axialkraft dynamisch | Force axiale dynam. autorisée | Permissible axial force dynamic | 50 N | 50 N |
| Befestigungsrastrer | Trame de fixation | Fixing grid | 30 mm | 30 mm |
| Befestigungsgewinde | Filet de montage | Mounting thread | M4 | M4 |
| Einsatztemperatur Modul | Modul plage température | Temperature range modul | 10–40 °C | 10–40 °C |
| Max. Temperatur Motor | Moteur max. température | Temperatur range motor | 80 °C | 80 °C |
| Luftfeuchtigkeit: | Humidité: | Humidity: | < 90 % | < 90 % |
| –nicht kondensierend | – sans condensation | – non condensing | | |
| Geräuschpegel bei max. Nutzlast | Niveau sonore de charge maxi | Nois level maxi capacity | 61 dB (A) | 61 dB (A) |
| Nennspannung | Tension nominale | Nominale voltage | 40–72 VDC | 40–72 VDC |
| Nonloistung Antrieb | Puissance nom. entraînement | Power drive | 80 W | 80 W |
| Zahnriemengetriebe | Courroie cranlée | Synchronous belt drive | i = 1:4.5 | i = 1:4.5 |
| Wegmesssystem: Digitaler Winkelencoder auf Motorende, Auflösung auf Welle | Transducteur de position: encodeur angulaire digital à l'extrémité du moteur, réssolution sur l'arbre | Distance mesuring system: digital angle encoder on end of motor shaft, resolution on shaft | 0,04°/Impuls | 0,04°/Impuls |
| Schutzart | Protection | Protective system | IP30 | IP30 |
| Antrieb | Entraînement | Drive | Bürstenloser Servomotor Servomoteur sans balais Brushless servomotor | |



Performance-Diagramm

Modulwelle in vertikaler Lage, Dauerzyklus bei Pausenzeit 400 ms

Diagramme des performances

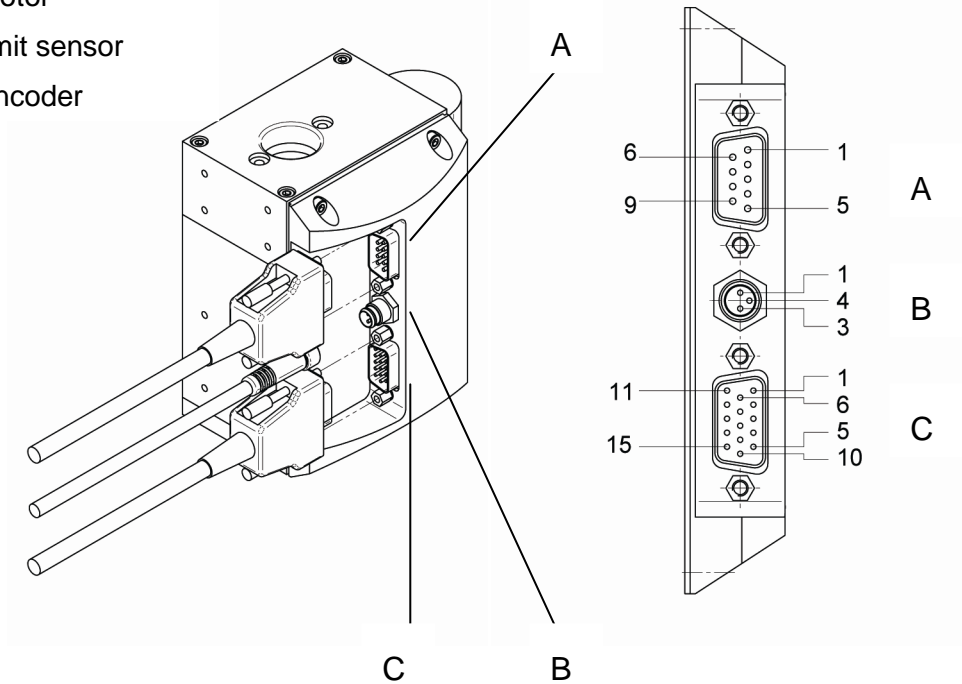
Module arbre en position verticale, Cycle permanent en fonction du temps de pause 400 ms


Performance diagram

Module vertical position, Continuous cycle at pause times 400 ms

3.2.1 Interfaces

- A Connection, motor
- B Connection, limit sensor
- C Connection, encoder



| | |
|---|--|
| ⚠ VORSICHT | |
|  | <p>Note the rated voltage of 40-72 VDC at RME-rotation module. For operation with a SE-Power servo controller is a transformer (230 VAC / 48 VAC) No. 50,019,967 needed. For operation with a foreign regulator also appropriate measures to reduce tension must be provided.</p> |

Motor Connection

The motor in the drive is directly connected to the motor connection. The following table lists the pin assignment (A) and the relevant signals.

Motor connection: (A)

| Pin | Signal |
|-----|-----------------|
| 1 | Motor winding 1 |
| 2 | Motor winding 2 |
| 3 | Motor winding 3 |
| 4 | GND, motor |
| 5 | not used |
| 6 | not used |
| 7 | not used |
| 8 | not used |
| 9 | not used |

3.2.1 Limit Sensor Connection

The limit sensor is connected to the control system via the limit sensor connection. The pin assignment (4) assignment according to DIN EN 50044) and that corresponding signal or voltage are specified in that following table.

3.2.3 Limit Sensor Connection: (B)

| Pin | Signal |
|-----|---------------|
| 1 | 5 ... 24 V DC |
| 3 | GND |
| 4 | Signal, PNP |

When the module shaft is outside of the limit position, the voltage is applied as signal to pin 4. When the limit sensor is triggered, GND is switched through to the outlet, pin 4.

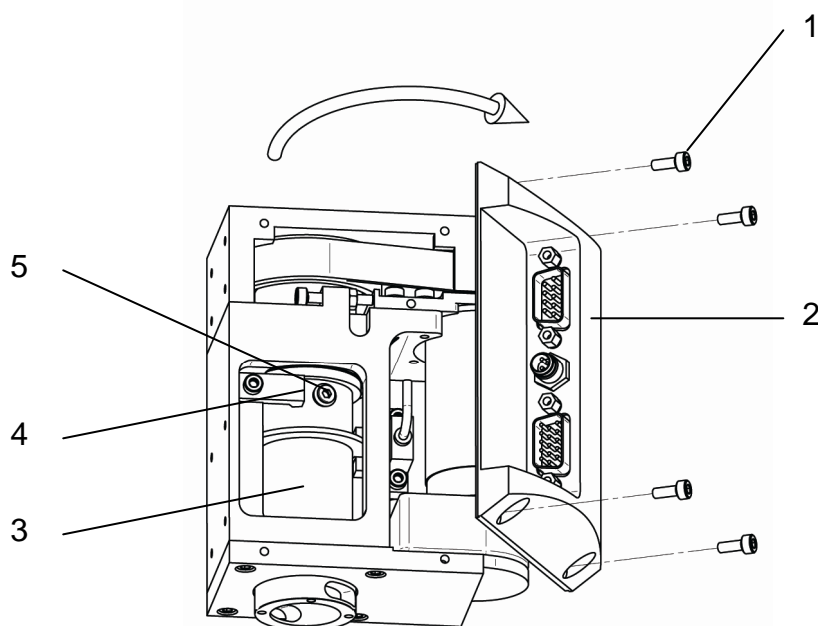
3.2.4 Encoder Connection

The signals and information of the encoder are transmitted to the control system via the encoder connection. The following table lists the pin assignment (6) and the respective signals.

Encoder Connection: (C)

| Pin | Signal |
|------------|-----------------------|
| 1 | GND, encoder |
| 2 | Channel A |
| 3 | Channel B |
| 4 | Index I |
| 5 | Hall sensor 1 |
| 6 | Hall sensor 3 |
| 7 | not used |
| 8 | GND, Hall sensor |
| 9 | + 5 V DC, encoder |
| 10 | Channel A/ |
| 11 | Channel B/ |
| 12 | Index I/ |
| 13 | Hall sensor 2 |
| 14 | Jumper to pin 9 |
| 15 | + 5 V DC, Hall sensor |

3.2.5 Mounting of the Limit Stop



- | | | | |
|---|--------------------------------------|---|-------------------------------|
| 1 | <i>Fastening screws, front cover</i> | 4 | <i>Limit stop in housing</i> |
| 2 | <i>Front cover</i> | 5 | <i>Stop screw with O-ring</i> |
| 3 | <i>Module shaft</i> | | |

Mounting of the Limit Stop

The range of rotation of the module can be limited to 320° by an optional mechanic limit stop. This is necessary, for example, when a winding-up of the cables of the elements or of the useful loads mounted on the module shaft is to be prevented.

1. Loosen the four screws (1) of the front cover (2) and put the front cover aside.

NOTE






Pay special attention to the cables which are connected to the inside of the front cover. These must not be squeezed, kinked or elongated.

2. Screw in the stop screw M3 (5) with the O-ring into the thread of the module shaft (3) provided therefor.
3. Mount the front cover.

Disassembly is done in reverse order of the assembly.

3.2.6 Installation

|  CAUTION | |
|--|---|
|  | Switch off the controller of the module and secure from being switched on again unintentionally. The signals of the control may cause unintentional movements of the module which may lead to personal injuries. |

| NOTE | |
|---|--|
|  | The pin numbers listed in the following tables refer to the connectors of the cables towards the module. |

1. Connect the plug of the motor cable, with the connector of the motor connection (1) of the module and secure the connector with the screws of the plug.
2. Connect the leads of the motor cable to the control system according to the following table.

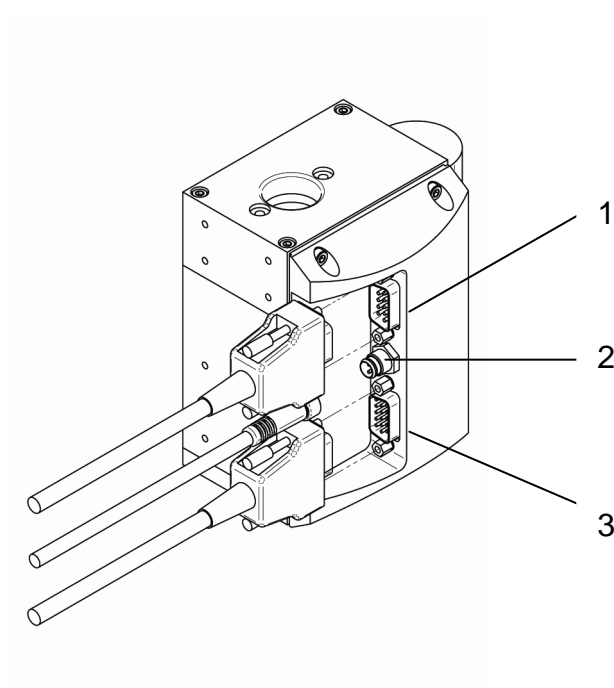
| Pin Colour / Number | Signal |
|---------------------|---------------------------|
| 1 black / 1 | Motor winding 1 (phase U) |
| 2 black / 2 | Motor winding 1 (phase V) |
| 3 black / 3 | Motor winding 1 (phase W) |
| 4 yellow/green | GND, motor |
| 5 - | not used |
| 6 - | not used |
| 7 - | not used |
| 8 - | not used |
| 9 - | not used |

1. Connect the plug of the sensor cable, to the connector of the limit sensor (2) of the module.
2. Connect the leads of the sensor cable to the control system according to the following table.

3.2.7 Connection electrical

| Pin Colour/ Nr. | Signal |
|-----------------|---------------|
| 1 brown | 5 ... 24 V DC |
| 2 blue | GND |
| 3 black | Signal, PNP |

1. Connect the plug of the encoder cable, with the connector of the endcoder (3) of the module and secure the connector with the screws of the plug.
2. Connect the encoder cable (connector D-Sub, 15-pin, male) to the control system.







1 Connection, motor

2 Connection, limit sensor

3 Connection, encoder



3.2.8 First Operation

|  CAUTION | |
|--|---|
|  | Ensure that no person can reach into the possible range of motion of the module. Fast or unintentional movements of the module can result in injury. |

|  CAUTION | |
|--|--|
|  | Remove all the objects, e.g. tools, from the range of motion of the module. They could get greatly accelerated by the movement of the module and cause personal injuries. |

|  CAUTION | |
|--|--|
|  | Remove all cables from the range of motion of the module. |



3.2.9 Functional Inspection

|  CAUTION | |
|--|---|
|  | Switch off the controller of the module and secure from being switched on again unintentionally. The signals of the control may cause unintentional movements of the module which may lead to personal injuries. |

1. Loosen the screws of the motor cable on the module and pull off the plug from the motor connection (1).
2. Switch on the control system and make sure that the outlets for the motor drive remain currentless (control disabled).
3. Rotate the module shaft carefully until the signal of the limit sensor changes.
4. Turn the module shaft carefully away from the limit position. The signal of the limit sensor on the control must change again.
5. Continue to turn the module shaft carefully through exactly 180°
 - a) The moments of momentum are counted and displayed on the controller.
 - b) If the scale factor is adjusted correctly, then the rotation displayed on the controller of the RME-080 is 180°
 - c) The setting of the counting direction is okay.
6. Switch off the control system.
7. Connect the plug of the motor cable with the connector of the motor connection (1) of the module and secure the connector with the screws of the plug.
8. Switch on the control system.
9. Enable the outlets of the control for the drive (control enabled).


3.3.0 Start-up

Reference Run

|  CAUTION | |
|--|--|
|  | If the module shaft oscillates intensely during the commissioning (very strong vibrations at the drive), switch off the module immediately, check the parameters and readjust the parameters, if necessary. |

1. Start the reference run via the control system.
 - a) The module shaft turns clockwise at reduced speed (looking on the top cover (1) of the module from above) to the limit position until the limit sensor recognizes the groove (9) in the ring of the module shaft (6). (pages 6)
 - b) Then the module shaft slowly turns counter-clockwise up to the edge of the groove (home position).

3.3.1 Programming

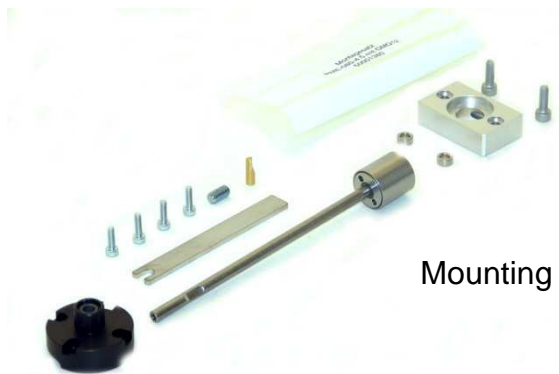
| NOTE | |
|---|--|
|  | During programming pay special attention to eventually existing collision points, such as elements or useful loads which are attached to the module. |

1. Program the desired movements of the module.
2. Check these movements first at reduced speed.
3. Increase the speed slowly, until the maximum desired speed is attained.

3.3.2 Rotary Gripper Module (Retrofitting with mounting kit)

The RME rotary modules can be retrofitted with a gripper tongs.
Order it in the kit Afag the appropriate retrofit.

Mounting kit: RME-080-4.5 mit GMQ 12 **Order No.: 50001380**
And the desired Gripper actuators GMQ 12 **Order No.: 11009173**
Gripper **Order No.: see Technical Catalogue**

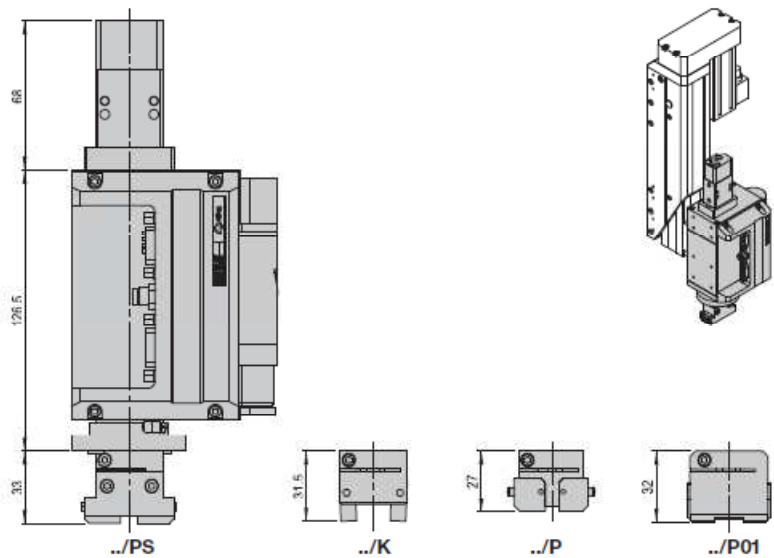


Mounting kit 50001380

The company offers you a complete afag AG Rotary gripper modules, you just select the desired gripper and order accordingly. (see below). The rotary gripper combinations will be delivered ready for operation.

Note:

Order it in the kit Afag the appropriate retrofit.





Komplette Set-Angebote
Kits RME disponibles
RME assembly kit

Bestellnummer
 Article No.
 Order No.

| | |
|------------------------|----------|
| RME 080-4.5/GMQ 12/PS | 50004064 |
| RME 080-4.5/GMQ 12/K | 50004063 |
| RME 080-4.5/GMQ 12/P | 50004060 |
| RME 080-4.5/GMQ 12/P01 | 50004062 |

4.0.0 Maintenance Instructions

4.1.0 Maintenance and Servicing

|  CAUTION | |
|--|--|
|  | <p>Bei eingeschalteter Steuerung kann das RME-080 unvorhersehbare Bewegungen ausführen und schwere Verletzungen oder Sachschäden verursachen.</p> <p>Stellen Sie sicher, dass bei Arbeiten am Modul die Steuerung ausgeschaltet und gegen Wiedereinschalten gesichert ist.</p> |

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

Further maintenance

Under the following conditions is the RM rotatif module maintenance free:

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

4.1.1 Safety Labels

The safety labels are attached to the following positions. Check whether the safety labels are present and easily readable at regular intervals





| | |
|--|-----------------------------------|
|  CAUTION | |
|  | Attention: 1 „Hot Surface“ |



4.1.2 Possible Failures


The module cannot complete the reference run.

|  CAUTION | |
|--|--|
|  | <p>If the module shaft oscillates heavily (very strong vibrations at the drive), switch off the module immediately to prevent damages to the mechanism!</p> |



| Fault | Possible Cause | Fault Removal |
|---|---|---|
| Module shaft oscillates (very strong vibrations at the drive) | Moment of inertia of the elements / useful load on the module shaft too high. | Reduce moment of inertia (keep to the indications of the catalogue) |
| | Control parameters wrongly set | Reset parameters at the control |
| Module shaft continues to turn without interruption (limit stop not mounted) | Limit sensor wrongly connected | Check pin assignment and correct, if necessary |
| | Limit sensor connection interrupted | Check the sensor cable |
| | Limit sensor defective | Replace the limit sensor according. Commissioning according. |
| Module shaft turns up to the optional limit stop and then stops. | Limit sensor wrongly connected | Check pin assignment and correct, if necessary |
| | Limit sensor connection interrupted | Check the sensor cable |
| | Limit sensor defective | Replace the limit sensor according. Commissioning according. |
| Module shaft turns up to the wrong side of the optional limit stop and then stops | Wrong direction of reference run | Check direction of reference run and change, if necessary |
| | Drive wrongly connected | Check pin assignment and correct, if necessary. Commissioning according |

| Fault | Possible Cause | Fault Removal |
|----------------------------|------------------------------|--|
| Module shaft does not move | Drive wrongly connected | Check pin assignment and correct, if necessary. Commissioning according. |
| | Motor connection interrupted | Check motor cable |
| | Drive defective | Have the drive replaced by Afag AG |

4.1.3 Manfunctions during operation:


| CAUTION | | |
|---|--|---|
|  | <p>If the module shaft oscillates heavily (very strong vibrations at the drive), switch off the module immediately to prevent damages to the mechanism!</p> | |
| Fault | Possible Cause | Fault Removal |
| Module shaft oscillates (very strong vibrations at the drive) | Moment of inertia of the elements / useful load on the module shaft too high | Reduce moment of inertia (keep to the indications of the catalogue) |
| | Control parameters wrongly set | Reset parameters at the control |
| Module shaft stops after a short turn | Important contouring error | Reduce values for acceleration and speed |
| | | Check whether module shaft is stalled mechanically |
| | Encoder connection interrupted | Check encoder cable |
| | | Check the encoder for proper functioning. Commission according. |
| Toothed belt whistles | Wrong toothed belt tension | Check the toothed belt tension and restretch according. |
| | Toothed belt defective | Replace defective toothed belt according. |

4.1.4 Fault Removal


|  CAUTION | |
|--|--|
|  | <p>Switch off the controller of the module and secure from being switched on again unintentionally. The signals of the control may cause unintentional movements of the module which may lead to personal injuries.</p> |

4.1.5 Replacement of the Toothed Belt

1. Loosen the screws (1) of the front cover (2) and turn the front cover aside.

| NOTE | |
|---|---|
|  | <p>Pay special attention to the cables which are connected to the inside of the front cover. These must not be squeezed, kinked or elongated.</p> |

2. Loosen the three screws (2) of the cover (top) (1) and remove the cover.
3. Loosen the four fastening screws (5) of the motor plate (4) by approx. a quarter turn. You must be just able to move the motor plate.

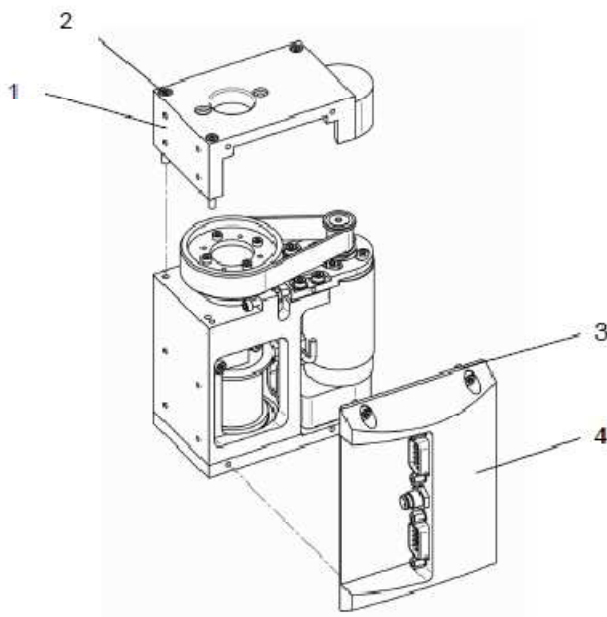
| NOTE | |
|---|--|
|  | <p>The motor plate may not be lifted off from the drive.</p> |

4. Loosen the lock nut (6) of the straining screw (7)
5. Loosen the straining screw of the motor plate, until you can push the motor plate to the left limit stop (1).
6. Replace the toothed belt (3). When inserting the new toothed belt (3) When inserting the new toothed belt make sure that the mark (4) on the toothed wheel of the drive is aligned with the mark (3) on the tooth lock washer.
7. Turn the straining screw of the motor plate so that the toothed belt is slightly tense.
8. Check the tension of the toothed belt by pressing in the toothed belt at the centre between the two tooth lock washers with a force F (2) of exactly 1,7 N. The toothed belt must be pressed in by a depth f (1) of 0.7 mm \pm 0,1 mm.
9. If the toothed belt tension is not correct, change the tension as follows:

- a) If the tension of the toothed belt is too high (depth of indentation f smaller than 0.6 mm), turn the straining screw of the motor plate slowly counterclockwise. The motor plate is pressed by the toothed belt toward the left limit stop, until the tension is correct (1).

- b) If toothed belt tension is too low (dept of indentation f greater than 0.8 mm), turn the straining screw of the motor plate slowly clockwise. The motor plate will be pressed toward the right limit stop and the toothed belt is stretched until the tension is correct (2).

10. Secure the straining screw with the lock nut.
11. Tighten the fastening screws of the motor plate carefully.
12. Check once again the tension of the toothed belt.
13. The assembly is done in reverse order of the disassembly



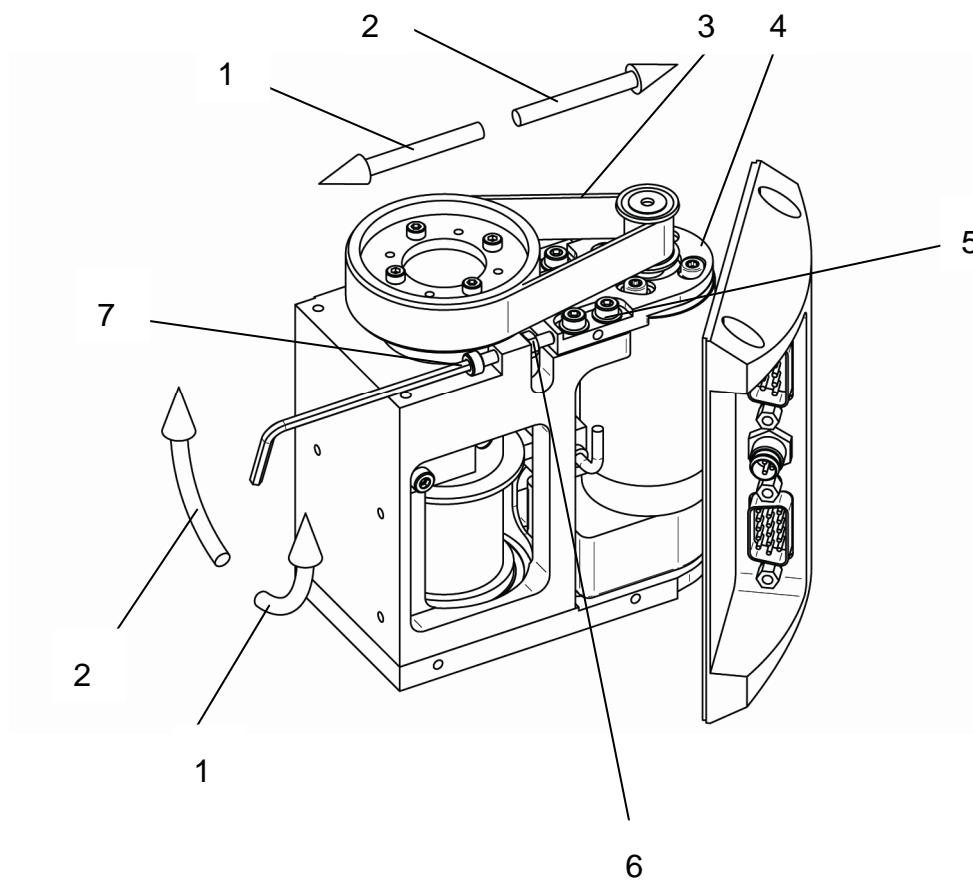
1 Cover, top

2 Fastening screws cover, top

3 Fastening screws, front cover

4 Front cover

4.1.6 Replacement of toothed belt



1 *Toothed belt tension too high
(relieve tension)*

2 *Toothed belt tension too low*

3 *Toothed belt*

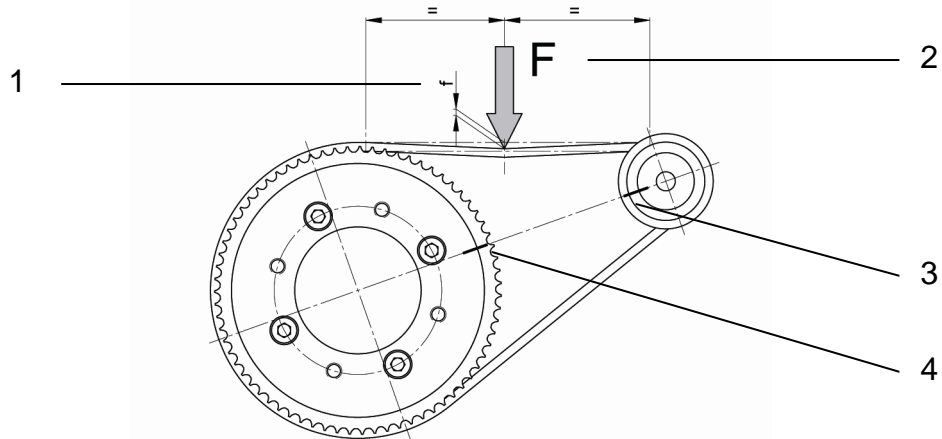
4 *Motor plate*

5 *Fastening screws, motor plate*

6 *Lock nut, straining screw*

7 *Straining screw, motor plate*

4.1.7 Replacement of toothed belt



- | | | | |
|---|--|---|-------------------------------------|
| 1 | <i>Depth of indentation f</i> | 2 | <i>Force F</i> |
| 3 | <i>Mark on tooth lock washer</i> | 4 | <i>Mark on toothed wheel, drive</i> |

Replacement of Limit Sensor

1. Disconnect the connecting cables at the module and put them aside.
2. Loosen the four screws (1) of the front cover (2), and put the front cover aside.

NOTE



Pay special attention to the cables which are connected to the inside of the front cover. These must not be squeezed, kinked or elongated.

3. Loosen the coupling ring of the connector of the limit sensor connection (3) in the front cover and pull the connector out of the front cover.
4. Loosen the two fastening screws (4) of the limit sensor (5), and remove the sensor.
5. Insert the new limit sensor and screw down the limit sensor with the two fastening screws and an angle and in center of the height.

NOTE





The limit sensor may not touch the ring of the module shaft.

4.1.8 Accessoires

| Description | Order No. | |
|--------------------------------------|-----------|-----------------------|
| Servo controller SE-Power | 50036337 | see catalog technical |
| Servo controller SE-48 I/O | 50102766 | |
| Servo controller SE-48 ProfiBus | 50102767 | |
| Trafo | 50019967 | |
| Encoder cable G3-5m-0-0 | 50036122 | |
| Encoder cable G7-3m-0-0 | 50341495 | |
| Encoder cable G7- 5m-0-0 | 50341496 | |
| Motor cable M2-5m-0-0 | 11017880 | |
| Motor cable M7-3m-0-0 | 50341508 | |
| Motor cable M7- 5m-0-0 | 50341509 | |
| Proximity switch cable R1-5m-0-open | 11006446 | |
| Proximity switch cable R1-5m-90-open | 11007826 | |
| Proximity switch cable R2-3m-0-0 | 11017754 | |
| Proximity switch cable R2-5m-0-0 | 50340271 | |
| Proximity switch cable R2-3m-90-0 | 50340272 | |
| Proximity switch cable R2-5m-90-0 | 50340903 | |
| Centering bushings Ø 7x3 | 11016850 | |
| Rotary flange RME | 50001368 | ↓ |
| Screw special RME / ZME | 50001373 | |

4.1.9 Disassembly and repair

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

|  CAUTION | |
|--|---|
|  | <p>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.</p> |


When can the modules be repaired by the customer?

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


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

When the customer detects that the respective module is still under guarantee:

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

| NOTE | |
|---|--|
|  | <p>Afag offers a reliable repair service. Please note that Afag does not guarantee for parts which were not repaired by Afag Automation AG.</p> |

5.0.0 Disposal

| NOTE | |
|---|--|
|  | RMEs which are of no further use should not be disposed of as a complete unit but dismantled into individual parts according to the type of material and recycled should be correctly disposed of. |



Afag Automation AG
Fiechtenstrasse 32
4950 Huttwil
Switzerland

Tel.: +41 (0)62 – 959 86 86
Fax.: +41 (0)62 – 959 87 87
e-mail: sales@afag.com
Internet: www.afag.com