



# Rotating module DMHe 200 / DMVe 600 – electrically-operated

max. load 2,000 N / 6000 N, max. torque 120 Nm



## 1 Description of the product

Rotating modules are used in assembly and handling processes to transform electrical energy into a rotating movement. When using the rotating module, component parts can be rotated rationally, quickly and safely and can be assembled ergonomically from all sides.

The strongly reduced worm gear allows high holding torques in standstill.

The double-bearing drive shaft compensates high axial and radial forces.

The rotating module is designed for a long service life. The electronically commutated DC motor is virtually wear-free.

## 2 Validity of the documentation

This document applies to the following products:

Rotating modules - horizontal and vertical axis of data sheet M1.201M1201. The following types or part numbers are concerned:

- 6508 0236 E
- 6509 1036 E

## 3 Target group of this document

- Specialists, fitters and set-up men of machines and installations with expert knowledge in electrical engineering.

### Qualification of the personnel

**Expert knowledge** means that the personnel must

- be in the position to read and completely understand technical specifications such as circuit diagrams and product-specific drawing documents,
- have expert knowledge (electric, hydraulic, pneumatic knowledge, etc.) of function and design of the corresponding components.

An **expert** is somebody who has due to its professional education and experiences sufficient knowledge and is familiar with the relevant regulations so that he

- can judge the entrusted works,
- can recognize the possible dangers,
- can take the required measures to eliminate dangers,
- knows the acknowledged standards, rules and guidelines of the technology.
- has the required knowledge for repair and mounting.

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## 4 Symbols and signal words

### **WARNING**

#### **Person damage**

Stands for a possibly dangerous situation.  
If it is not avoided, death or very severe injuries will result.

### **CAUTION**

#### **Easy injuries / property damage**

Stands for a possibly dangerous situation.  
If it is not avoided, minor injuries or material damages will result.



#### **Hazardous to the environment**

The symbol stands for important information for the proper handling with materials that are hazardous to the environment.  
Ignoring these notes can lead to heavy damages to the environment.



#### **Mandatory sign!**

The symbol stands for important information, necessary protection equipment, etc.

### **NOTE**

- This symbol stands for tips for users or especially useful information. This is no signal word for a dangerous or harmful situation.

## 5 For your safety

### 5.1 Basic information

The operating instructions serve for information and avoidance of dangers when installing the products into the machine as well as information and references for transport, storage and maintenance.

Only in strict compliance with these operating instructions, accidents and property damages can be avoided as well as trouble-free operation of the products can be guaranteed.

Furthermore, the consideration of the operating instructions will:

- avoid injuries
- reduce down times and repair costs,
- increase the service life of the products.

### 5.2 Safety instructions

- Avoid collisions and blockades of the drive or the mounting parts.  
These can lead to damages of the internal mechanics.
- Rotating movement of the flange plate and their mounting parts!  
Adjust the speed of the drive as per the developed safety concept, general guidelines and standards or provide safety devices, if required!
- If the maximum torque is exceeded, the drive will be switched off.  
After reducing the torque, further movement in push-button mode is possible.
- Exceeding the maximum holding torque or shock loads can lead to damages in the gearbox.  
Loss of self-locking and undesired movement of the work-piece are the consequences.  
When fixing additional mounting parts, counterhold the front block.

- Exceeding the maximum duty cycle can lead to damages of the electric motor and the electronics. Pay attention to technical characteristics
- In case of damage or malfunction of the components, these must be put out of operation immediately!
- The product was developed, tested and built according to the applicable EMC standards.  
In the beginning of the start up it has to be checked whether there are faults in or interactions between the components used.

### **NOTE**

#### **Qualification of the personnel, electronics**

All works may only be effected by qualified personnel, that due to their specialist (electrical) training, can evaluate the assigned work and recognize potential dangers.

### 5.3 Personal protective equipment



**For works at and with the product, wear protective gloves!**



**For works at and with the product, wear safety shoes!**

## 6 Application

### 6.1 Intended use

Rotating modules are designed for universal use in assembly and handling processes in the industry.

They are used for industrial applications in order to rotate work-pieces rationally, quickly and safely.

Furthermore the following are possible uses:

- Max. forces and / or torques only with the values indicated below technical characteristics.
- Use only within closed, low-dust rooms
- Use within the capacity indicated in the technical characteristics (see data sheet).
- Use as per operating instructions.
- Compliance with service intervals.
- Qualified and trained personnel for the corresponding activities.
- Mounting of spare parts only with the same specifications as the original part.

### 6.2 Misapplication

#### **WARNING**

#### **Injuries, material damages or malfunctions!**

- The product must never be opened. At the product no changes must be made, except the ones expressly mentioned in the operating instructions!

The use of the products is not authorised:

- For domestic use.
- For use at fairgrounds and amusement parks.
- In food processing or in areas with special hygiene regulations.
- In mines.
- In ATEX areas (in explosive and aggressive environments, e.g. explosive gases and dusts).
- If physical effects (welding currents, vibrations or others) or chemically acting media damage the seals (resistance of the

seal material) or components and this can lead to functional failure or premature failure.

**Special solutions are available on request!**

## 7 Transport

### **⚠ WARNING**

#### **Injury due to overturning product!**

- Overturning product due to inappropriate means of transportation.
- Do not stand below the load during lifting and lowering, stay outside the danger zone.
- Use suitable means of transportation.
- Pay attention to the weight of the equipment.
- Pay attention that the product is safely located (centre of gravity see instruction sign).

### **⚠ CAUTION**

#### **Damage caused by incorrect transport or means of transport!**

Lift the product only at the provided devices.



**For works at and with the product, wear protective gloves!**



**For works at and with the product, wear safety shoes!**

The product is delivered on a transport pallet and may only be transported to the place of destination by corresponding conveyors (pay attention to the weight), or be lifted from the pallet (see fig. ).

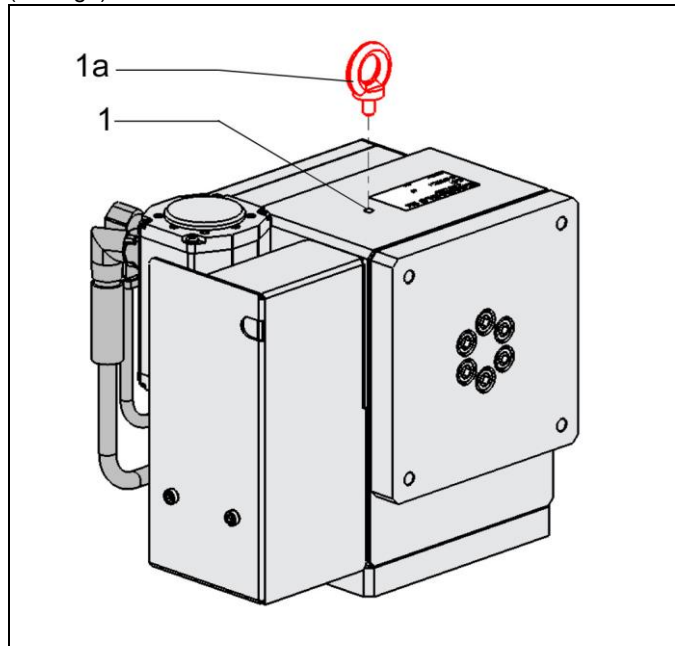


Figure 1: Place for lifting by forklift trucks (horizontal version 6508 0236 E)

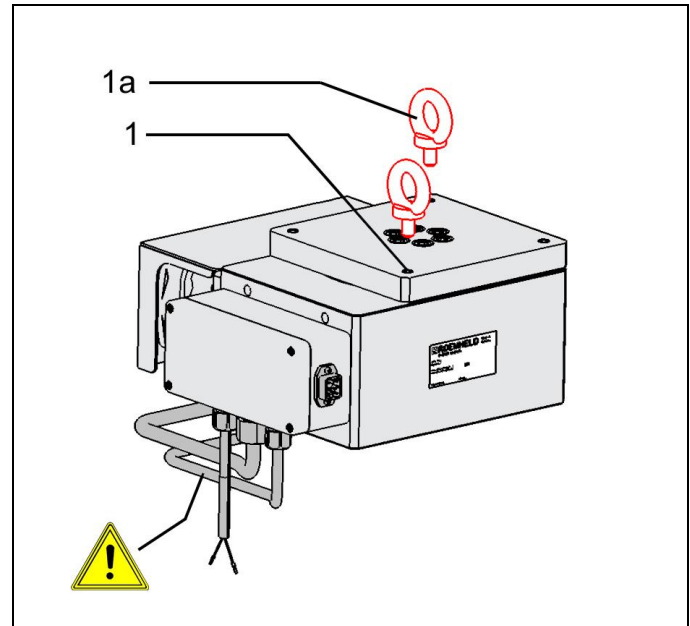


Figure 2: Place for lifting by forklift trucks (vertical version 6509 1036 E)

1 Thread to fix an eye screw	1a Eye screw (not included in the delivery)
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For transport and ease of assembly, a thread M8 for eye screws is provided in the housing of the rotating module.

## 8 Installation

### 8.1 Design

#### **⚠ WARNING**

##### **Injury by dropping parts!**

Some products have a heavy weight and can cause injury when dropping.

- Transport products professionally.
- Wear personal protection equipment!

Weight specifications see chapter "Technical characteristics".

#### **⚠ CAUTION**

##### **Heavy weight may drop**

- Some product types have a considerable weight. These have to be secured against dropping during transport.
- Weight specifications see chapter "Technical characteristics".

##### **Transverse forces and forced conditions!**

Side loads and forced conditions on the product lead to the premature failure.

- Avoid forced conditions (overdetermination) of the product.
- Max. forces and torques see technical characteristics.

##### **Max. adm. operating torque**

The maximum operating torque at the operating shaft must not be exceeded.

This can be achieved e.g. by limiting the operating stroke of the customer's operating element (hand lever or pedal) by the floor.

### 8.1.1 Version for horizontal or vertical load

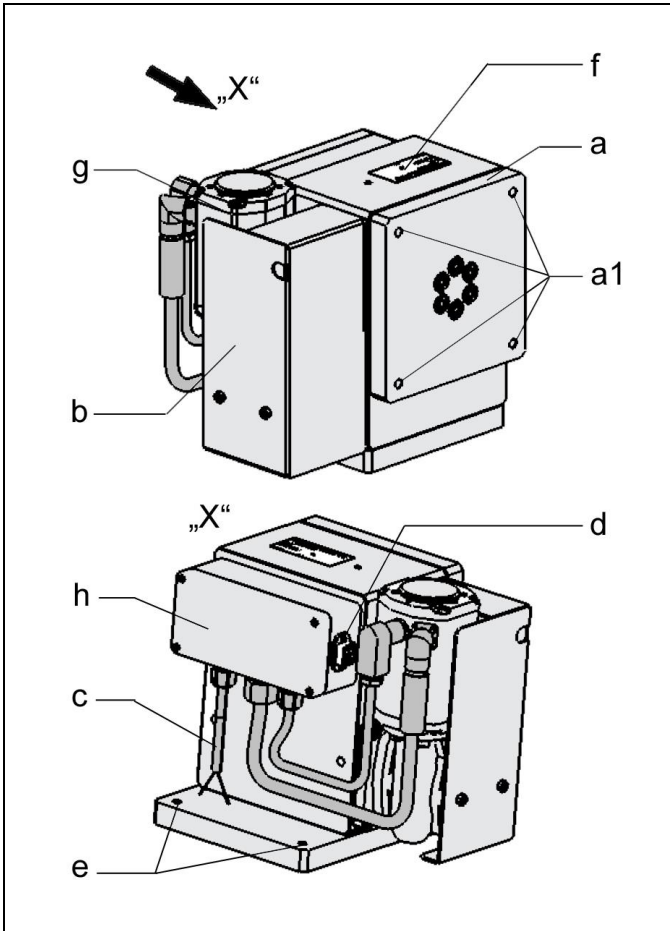


Figure 3: Components, horizontal version

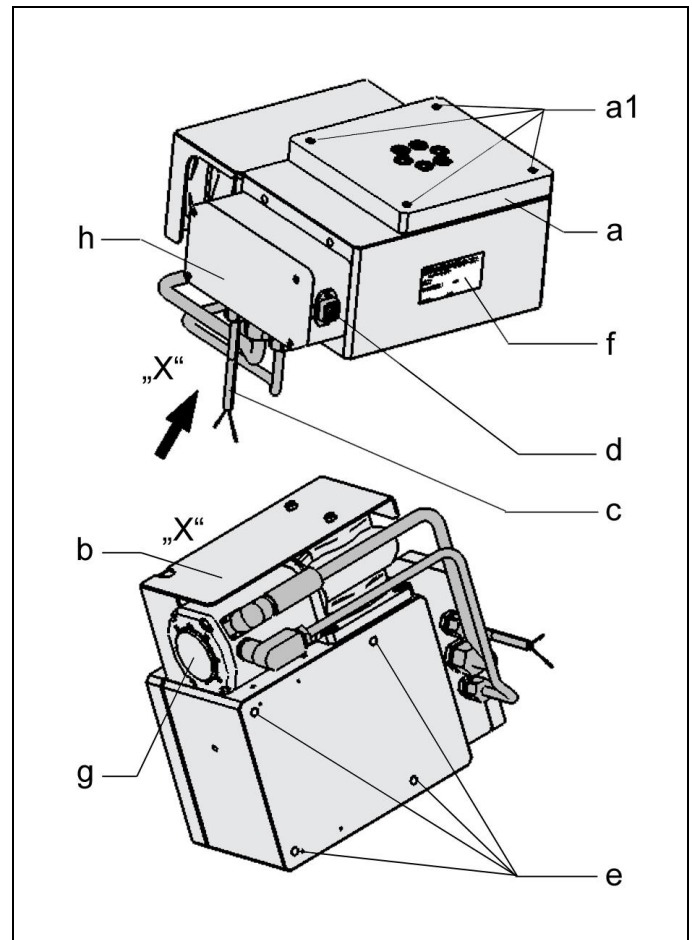


Figure 4: Components, vertical version

a	Flange plate	c1	Threads 4 x M10 to fix the rotating module
a1	Thread (4 x M10) to fix mounting components of the customer	f	Name plate
b	Protection plate	g	Electric motor with gear-box
c	Connecting cable 2 x 1.5 mm <sup>2</sup> , length approx. 3 m. 1 = + 24 V 2 = 0 V (GND), numbered	h	Housing with control
d	Connector socket for manual switch or foot switch (accessory)	X	View in the direction of the arrow

### 8.1.2 Design of the accessory

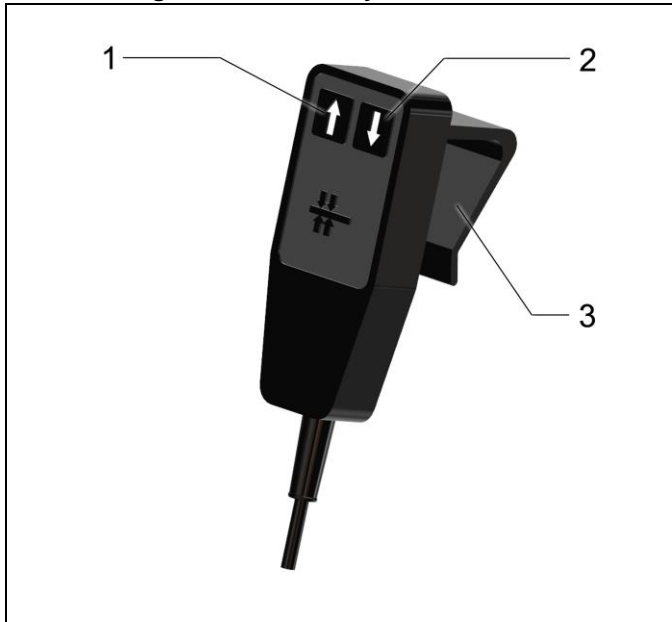


Figure 5: Hand panel

1 Push-button "sense of rotation clockwise"	3 Fastening hook
2 Push-button "sense of rotation counterclockwise"	



Figure 6: Foot switch

1 Push-button "sense of rotation clockwise"	2 Push-button "sense of rotation counterclockwise"
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### 8.1.3 Fixing of the product

#### **⚠ WARNING**

##### **Injury due to overturning product!**

- Overturning product due to missing or incorrect fixing!
- Fasten bottom plate on the floor.
- When introducing torques within the load limit (see technical characteristics) we recommend to use an additional base plate (accessory) and to secure this plate correctly.

#### **⚠ CAUTION**

##### **Damage of components!**

When mounting workpieces to the flange plate, make sure that the shaft of the screw does not protrude. Otherwise the flange plate can be blocked.

##### **Damage of internal components!**

Shock loads onto the output axis can lead to damages. When mounting the connecting construction, the flange plate must be secured externally.

#### **i Note**

The position and mounting type depend on the design of the rotating module.

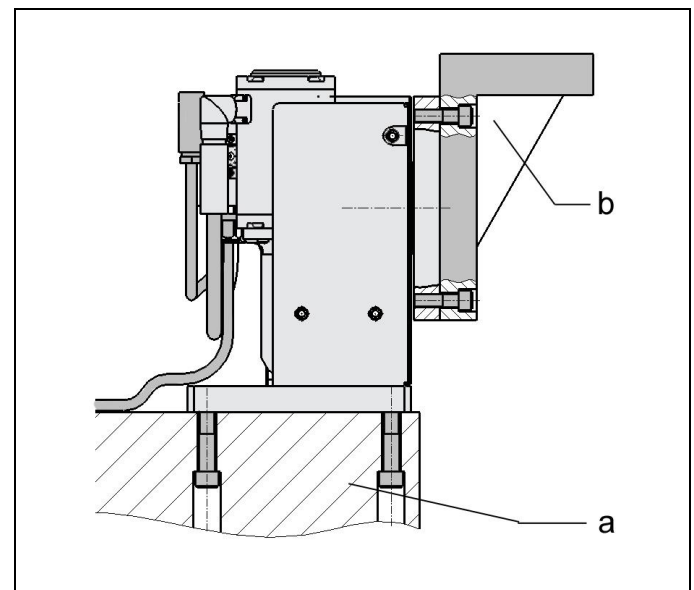


Figure 7: Possible types of mounting

a Customer's fixture body	b Angle bracket provided by the customer at the flange plate
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### 8.1.4 Mounting of the customer's connecting construction

#### **⚠ CAUTION**

##### **Protruding screws**

When mounting workpieces to the flange plate, make sure that the shaft of the screw does not protrude. Otherwise the flange plate can be blocked.

##### **Shock loads during installation**

Shock loads onto the output axis can lead to damages.

- When mounting the connecting construction, the flange plate must be secured externally.

1. For mounting the customer's connecting construction, bore holes or threads (M10 or Ø10.5 mm) are provided in the top / flange plate.  
All provided bore holes have to be used!
2. Fasten the connecting construction at the flange plate.



## NOTE

### Dangers due to the connecting construction of the customer

Dangers due to the connecting construction of the customer, as e.g. squeezing points have to be excluded by the customer's design.

In the case of eccentric loads, it is recommended to compensate these by counterweights. This prevents unregulated swinging of the load (changing - swivelling).  
In off-position the indicated maximum torques may occur (see Technical characteristics).  
The required forces and torques, around the axis of rotation, have to be considered by the operator.

## 9 Start up

### WARNING

#### Injury by crushing!

Components of the product make a movement while they are in operation, this can cause injuries.

- Keep parts of the body and items out of the working area!

#### Injury by crushing!

Due to protruding components there can be pinch points during installation.

- Keep hands and fingers away from pinch points!

#### Injury / burning due to contact with energized parts!

- Before working on electric equipment, the energized parts must be de-energized and secured.
- Do not open protection covers at electric parts.
- All electrical works must only be realised by electricians.

### 9.1 Preparation for start up

Before start up, the following tests have to be made:

- Check if there are any transport damages at the rotating module
- Check tight seat of the plug. The cables must be fixed by the user so that no bending and tensile stress will act and the cables cannot be damaged in any way.
- The rotating module was developed and built according to the applicable EMC standards EN 61000-6-2 and EN 61000-6-4.

It has to be checked whether there are faults in or interactions between the components used.

#### 9.1.1 Connection of power supply

The power supply is made via an external switching power supply (see accessory).

Alternatively, a 24 VDC switching power supply, 20 A, can be used that must be designed with short circuit protection.

- Connect the connecting cable to the power supply.  
Connection:  
1 = + 24 V  
2 = 0 V (GND),  
numbered

#### 9.1.2 Connect manual switch or foot switch

- Connect the manual switch or foot switch to the bushing of the rotating module and fix it with the enclosed screw. Tightening torque 0.4 Nm

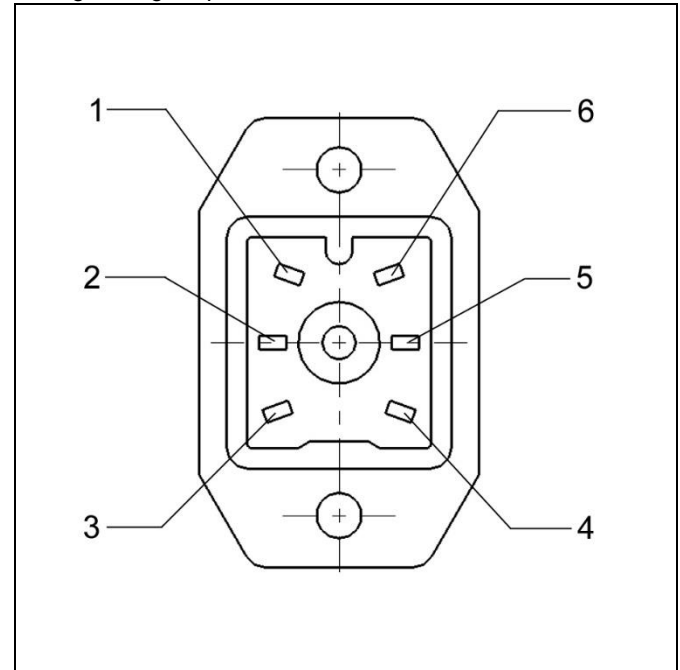


Figure 8: Connection of the ports

1 +24V output (for manual switch)	4 input counterclockwise rotation
2 GND	5 output position reached +24V
3 input clockwise rotation	6 output error

#### 9.1.3 Switch on power supply

To set up the rotating drive and the control, switch on the power supply.

#### 9.1.4 Move to the off-position - zero position

Push a directional key (↑) or. (↓) of the manual switch or foot switch (see accessory). Turn the flange plate (with mounted parts) to the desired off-position - zero position.

#### 9.1.5 Save the off-position - zero position

To save the off-position, push both directional keys of the manual switch or foot switch for three seconds. The current position will be saved as off-position - zero position.

#### 9.1.6 Interface for higher-level control

Reaching of the positions can be evaluated by the higher-level control via the interface signal "position reached(5)". The interface signal "error (6)" provides information on a pending error and can be evaluated by the higher-level control.

### 9.1.7 Adjust the speed of rotation

#### **⚠ WARNING**

**Injuries due to rotating movement of the flange plate and their mounting parts!**

Adjust the speed as per the developed safety concept, general guidelines and standards or provide safety devices, if required!

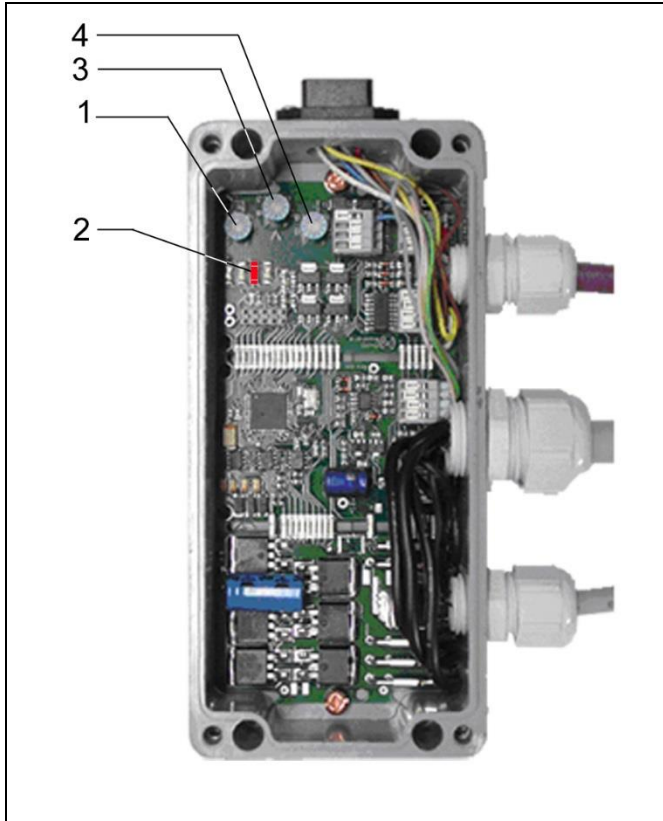


Figure 9: Position of the elements on the board

1 Trimming potentiometer to adjust the indexing angle	3 Trimming potentiometer to adjust the speed of rotation
2 LED for the display of malfunctions	4 Trimming potentiometer to adjust the brake ramp

The speed of rotation can be adjusted by a trimming potentiometer on the control board.

For this purpose, open the cover of the control. Carefully operate the trimming potentiometer with the screwdriver until the desired speed of rotation is obtained. Close the cover again.

### 9.1.8 Adjust the indexing angle

The indexing angle is factory set to an angle of 90°. This means that the rotating module stops automatically when reaching one of the 90° positions.

However, this can be adapted afterwards to the desired requirements.

The indexing angle can be changed step by step by means of the trimming potentiometer with the marking E on the control board.

- Pos. 0 - indexing angle 90° (factory setting)
- Pos. 3 - indexing angle 45°
- Pos. 7 - indexing angle 60°
- Pos. 10 - indexing angle 180°

### 9.2 Adjust the brake ramp

The brake ramp when stopping a movement can be adjusted by a trimming potentiometer on the control board.

For this purpose, open the cover of the control. Carefully operate the trimming potentiometer with the screwdriver until the desired brake ramp is obtained. Close the cover again.

## 10 Operation

#### **⚠ WARNING**

##### **Injury by crushing!**

Components of the product make a movement while they are in operation, this can cause injuries.

- Keep parts of the body and items out of the working area!

##### **Injury by crushing!**

Due to protruding components there can be pinch points during installation.

- Keep hands and fingers away from pinch points!

The control works in the so-called touch control mode.

When operating the direction buttons to the left or right, the drive makes the preselected rotation. If the key is released during the movement, the drive stops immediately.

## 11 Maintenance

### 11.1 Cleaning

The following cleaning works have to be effected daily at the mechanical components.

1. Clean with cleaning clothes or cleaning rags.
2. Slightly lubricate the metallic components (plates, guides, etc.).

#### 11.1.1 Monthly checks

- Visual inspection.
- Check the unit for damages and possible running marks, repair if required.
- Check the axial and radial clearance, repair if required.
- Check all fixing screws, retighten if required.

#### 11.1.2 Yearly checks

The power supply must be checked regularly by a specialist, but at least once a year for proper function.

### 11.2 Repair

#### **ⓘ NOTE**

##### **Repair works**

- Repair works, as e.g. the change of the interior lifting jack may only be effected by the ROEMHELD service technicians.

#### 11.3 Service life

In the case of high availability, the rotating modules should be checked at the latest after 1,000,000 rotating cycles (1/4 rotation) or after 2 years by ROEMHELD service personnel.

## 12 Trouble shooting

### ⚠ CAUTION

#### All work by service personnel only!

- All works only to be effected by ROEMHELD service staff.

### 12.1 Error detection / error code

External influences or internal faults can lead to faulty functions of the module.

The control carries out a number of checks and displays faults with a flashing LED error code on the integrated control board. This can be detected visually, but can also be evaluated through the interface signal "Message error code" by a priority control.

The error code consists of a series of flash pulses followed by a pause.

By counting the flash impulses between the pauses, the error code can be determined.

The currently evaluated errors are listed in the following table.

Error code	Cause
2	Reset of the processor during motion command
3	Undervoltage of the supply of the control
4	Overvoltage of the supply of the control
8	Impermissible signal states of the commutation electronics
9	Relative duty cycle exceeded
10	High overcurrent by defective component (cross fault)
11	When controlling, there is no motor current flow
12	The rotating module has been overloaded or blocked

### 12.2 Trouble shooting

Fault	Cause	Remedy
Indexing angle (90°) is exceeded	Incorrectly set off-position - zero position	Reset the off-position - zero position
	Too fast rotation	Reduce speed of rotation
	Max. admissible torques exceeded	Reduce torques
The product stops or does not start even if the button is pressed.	Energy supply is interrupted	Re-establish the energy supply
	Max. admissible torques exceeded	Reduce torques
	External blockade of the workpiece or the fixture	Remove blockade
Angular clearance of the flange plate too large	Wear or max. admissible torques exceeded	<b>⚠ Caution</b> Work should be performed only by Römheld service personnel.

## 13 Accessory

### 📌 NOTE

#### Accessories

- See data sheet.

## 14 Technical characteristics

### Maximum admissible load

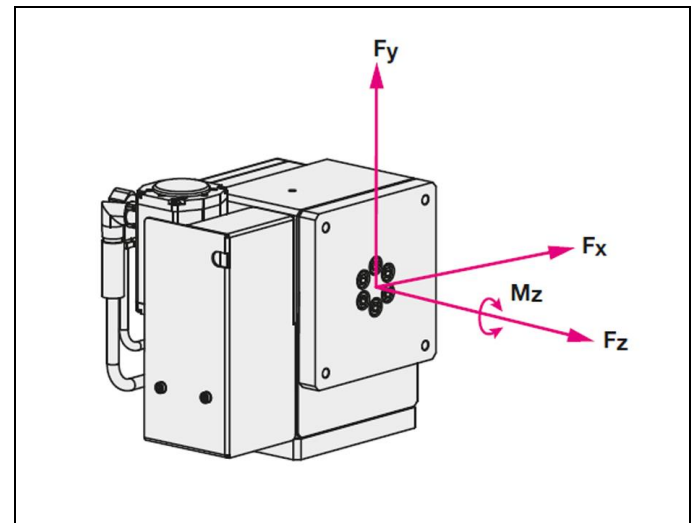


Figure 10: Axes of the introduced forces and torques, horizontal

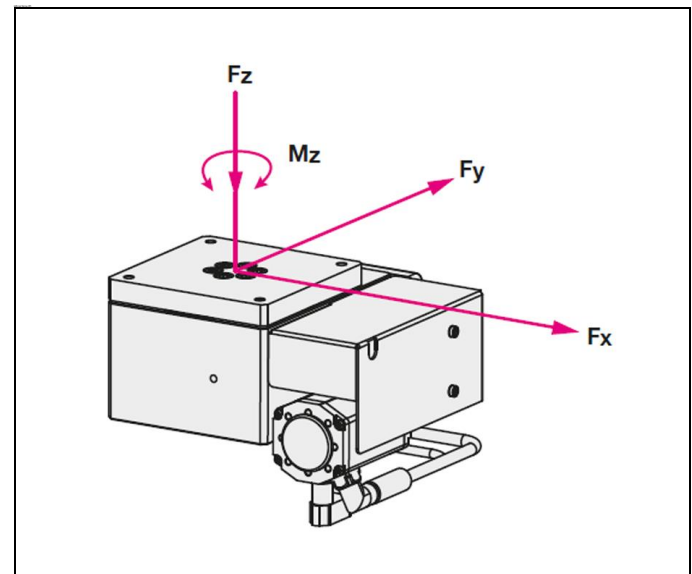


Figure 11: Axes of the introduced forces and torques, vertical

### General characteristics

	65080236E	65091036E
Max. admissible force		
Fx, [N]	2,000	2,000
Fy, [N]	2,000	2,000
Fz, [N]	1,000	6,000
Max. torque Mz, driven, [Nm]	120	120
Max. holding torque MZ, static, jerkless [Nm]	350	350
Max. admissible torque, total Mxyz, [Nm]	800	800
Angle of rotation	360°	360°
Indexing angle, preadjusted	4 x 90°	4 x 90°
Max. speed of rotation, [1/min]	7.5	7.5
From the starting and extending speed results a cycle time of 3 sec.		
Max. duty cycle:	25%, 1 min On	25%, 1 min On
Code class	IP50	IP50



Current consumption at max. torque, A	20	20
Supply voltage, V DC	24...30	24...30
Weight	23 kg	23 kg
Surfaces:	Gear housing and motor	black anodized,
	Flange plate and protection plate	black oxide
	Control box	grey
	Gearbox	Zinc die-cast, bright

In the case of eccentric loads, it is recommended to compensate these by counterweights. In off-position, the indicated maximum torques may occur.

### Current consumption

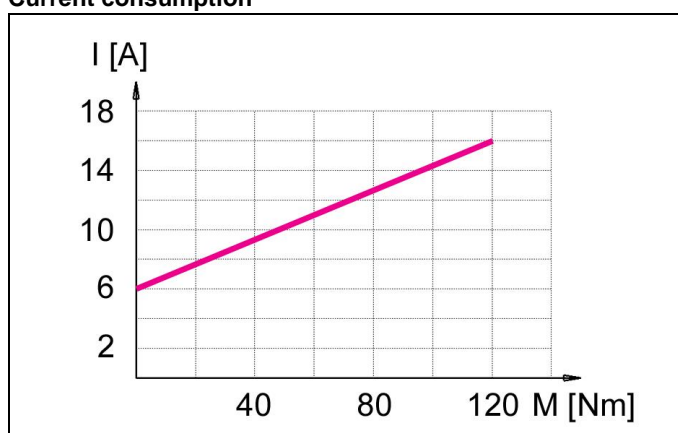


Figure 12: Diagram of the current consumption

M Torque [Nm]	I Current consumption [A]
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Tolerance of performance data  $\pm 20\%$  at room temperature of  $20^\circ\text{C}$  and run-in mode!

### NOTE

#### Further information

- For further technical data see ROEMHELD data sheet. M1201

## 15 Disposal



### Hazardous to the environment

Due to possible environmental pollution, the individual components must be disposed only by an authorised expert company.

The individual materials have to be disposed as per the existing regulations and directives as well as the environmental conditions.

Special attention has to be drawn to the disposal of components with residual portions of hydraulic fluids. The instructions for the disposal at the material safety data sheet have to be considered.

For the disposal of electrical and electronic components (e.g. stroke measuring systems, proximity switches, etc.) country-specific legal regulations and specifications have to be kept.

## 16 Declaration of incorporation

### Manufacturer

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

### Responsible person for the documentation:

Dipl.-Ing. (FH) Jürgen Niesner, Tel.: +49(0)6405 89-0.

This declaration of incorporation applies to the following products:

Rotating modules - horizontal and vertical axis of data sheet M1.201M1201. The following types or part numbers are concerned:

- 6508 0236 E
- 6509 1036 E

The listed products are designed and manufactured in line with the relevant versions of the directives **2006/42/CE** (EC-MSRL) and in compliance with the valid technical rules and standards. In accordance with EC-MSRL, these products are not yet ready for use and are exclusively designed for the installation in a machine, a fixture or a plant.

The following additional EU directives were applied:

- **2006/42/EC**, Machinery directive [[www.eur-lex.europa.eu](http://www.eur-lex.europa.eu)]
- **2011/65/EU**, RoHS

**2014/30/EU EMC** - Electromagnetic compatibility [[www.eur-lex.europa.eu](http://www.eur-lex.europa.eu)]

The following harmonised standards have been applied:

**DIN EN ISO 12100**, 2011-03, Safety of machinery; Basic concepts, General principles for design (replacement for part 1 and 2)

**DIN EN ISO 13849-1**:2023-12, Safety of machinery - Safety-related parts of control systems - General principles for design

**DIN EN ISO 13849-2**, 2008-09, Safety of machinery - Safety-related parts of control systems - Validation

**DIN EN 60204-1**; 2007-06, Safety of machinery - Electrical equipment of machines, Part 1: General requirements

The products may only be put into operation after it was assessed that the machine, in which the product shall be installed, corresponds to the machinery directives (2006/42/EC).

The manufacturer commits to transmit the special documents of the products to state authorities on request.

The technical documentation as per appendix VII part B was prepared for the products.



Ewgeni Schleining  
Development Team Leader MH

**Römheld GmbH**  
**Friedrichshütte**

Laubach, 08.07.2024