



Rotating module – vertical axis DMV 600

Max. load 6,000 N manual operation



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1 Description of the product

1.1 General description

The rotating module - horizontal axis DMV is a plain bearing rotation axis that can compensate high axial and radial forces. The angle of rotation in both directions is 360°.

Due to special bearings it is insensitive to shocks and thrusts.

The design of the rotating module allows its integration in applications with light as well as with heavy loads.

When using the rotating module in assembly processes, workpieces can be rotated rationally, quickly and safely and can be assembled ergonomically from all sides.

The rotating module is – except in its basic version

– equipped with an indexing.

Indexing is the procedure to proceed to the next working process.

The indexing angle is 8 x 45°, 6 x 60°, 4 x 90°, 3 x 120°.

1.2 Version with indexing by foot pedal

The rotating module with hydraulic indexing is a compact and functional unit.

It consists of a basic module with integrated indexing mechanism and an operating unit with foot pedal, connected by a 2 m long hydraulic hose.

This flexible connection allows the individual placement of the operating unit at the most favourable ergonomic position.

The rotating operation is manually effected at the workpiece or at the assembly fixture.

2 Validity of the documentation

This document applies to the following products:

Rotating modules - horizontal axis of data sheet M3.101. The following types or part numbers are concerned:

Version without indexing:

6506-10-36-O

Indexing with foot pedal:

6509-10-45-O-I,

6509-10-60-O-I,

6509-10-36-O-I,

6509-10-12-O-I.

3 Target group of this document

- Specialists, fitters and set-up men of machines and installations with hydro-mechanical expert knowledge.

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 of function and design of the corresponding components.

A specialist 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.

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.

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

⚠ WARNING

Injuries due to misuse, incorrect operation or abuse!

Injuries can occur if the product is not used within the intended use and the technical performance data.

- Before start up, read the operating instructions!

Poisoning due to contact with hydraulic oil.

Wear, damage of the seals, aging and incorrect mounting of the seal kit by the operator can lead to escapes of oil.

Incorrect connection can lead to escapes of oil at the ports.

- For handling with hydraulic oil consider the material safety data sheet.
- Wear protection equipment.

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!

⚠ CAUTION

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.

Performance of the product!

The admissible performance data of the product, see chapter "Technical characteristics", may not be exceeded.

NOTE

Qualification of personnel

All works may only be effected by qualified personnel familiar with the handling of hydraulic components.

5.2.1 Personal protective equipment



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



**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 workpieces 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 Installation

7.1 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.

7.1.1 Version without indexing

The rotating module does not have an indexing in its basic version.

The rotating operation is effected manually at the workpiece or at the assembly fixture.

7.1.2 Version with hydraulic indexing

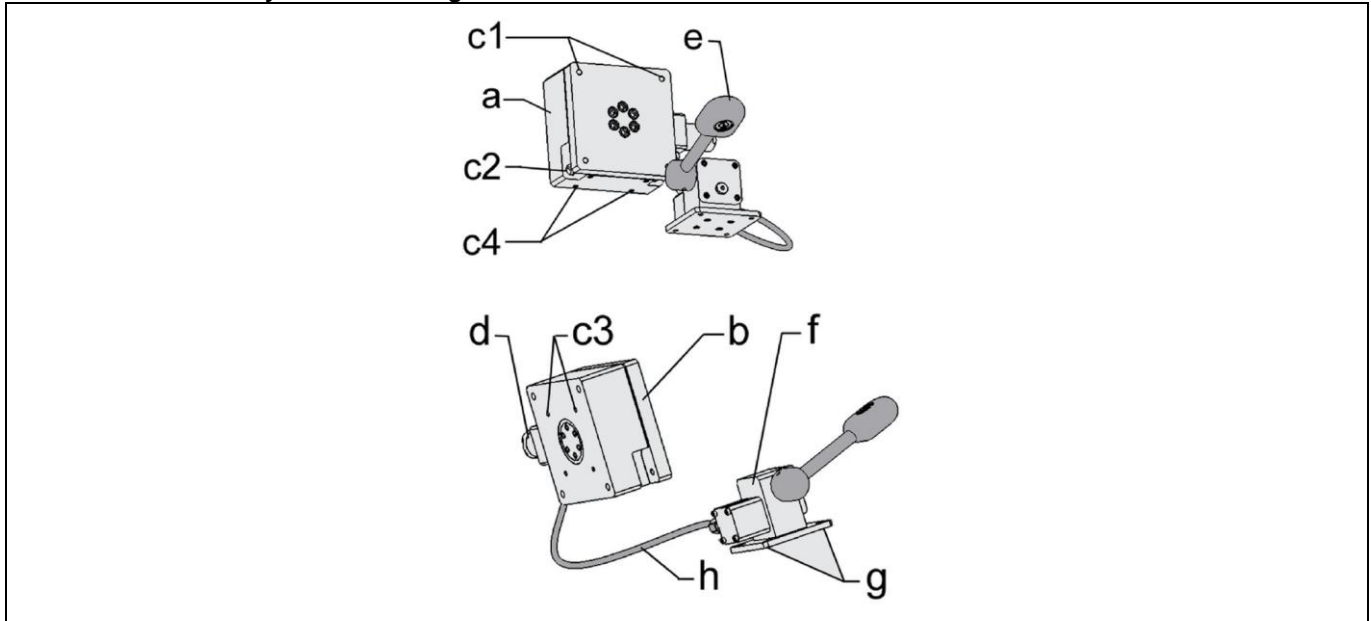


Figure 1: Components

⚠ CAUTION

Stroke module, pump lever not operate on bottom base plate

Foot pedal is pressed down below the lower edge of the base plate.

- The customer has to make sure that this will be prevented by the concrete floor or a corresponding base plate connecting construction.

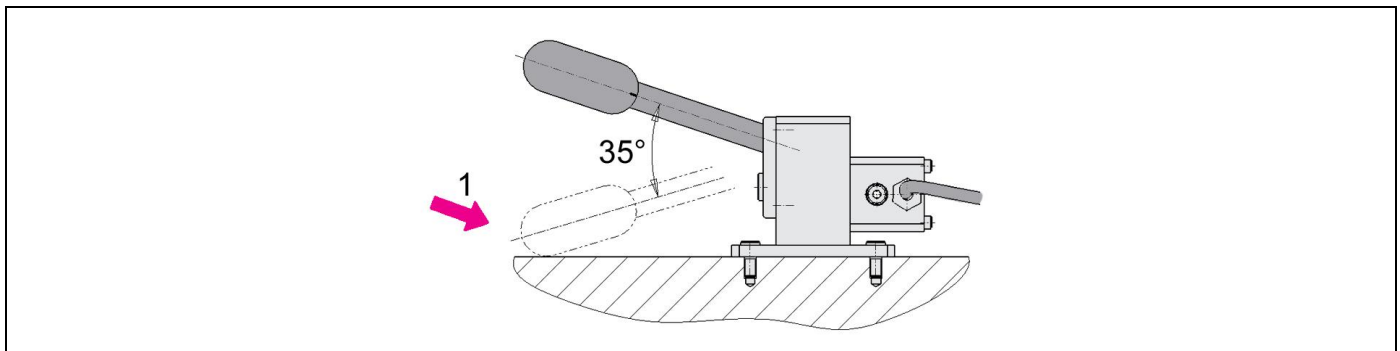


Figure 2: External stop

<p>a Basic unit</p> <p>b Flange plate</p> <p>c1 Threads 4 x M10 to fix further components</p> <p>c2 Counterbores for 4 x M10 to fix the rotary module at the fixture</p> <p>c1 Threads 4 x M10 to fix the index. Not suitable to fix add-ons.</p> <p>c4 Threads 4 x M10 to fix the rotating module vertically on the fixture</p>	<p>d Hydraulic indexing (receiver unit)</p> <p>e Foot pedal</p> <p>f Pressure generator (transmitter unit)</p> <p>g Bore holes 4 x M8 to fix the pressure generator</p> <p>1 External stop</p>
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ℹ NOTE

Pressure generators, hoses and hydraulic indexing must not be opened.
Penetrating air can lead to malfunction.

7.2 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

Stroke module, pump lever not operate on bottom base plate

Foot pedal is pressed down below the lower edge of the base plate.

- The customer has to make sure that this will be prevented by the concrete floor or a corresponding base plate connecting construction.

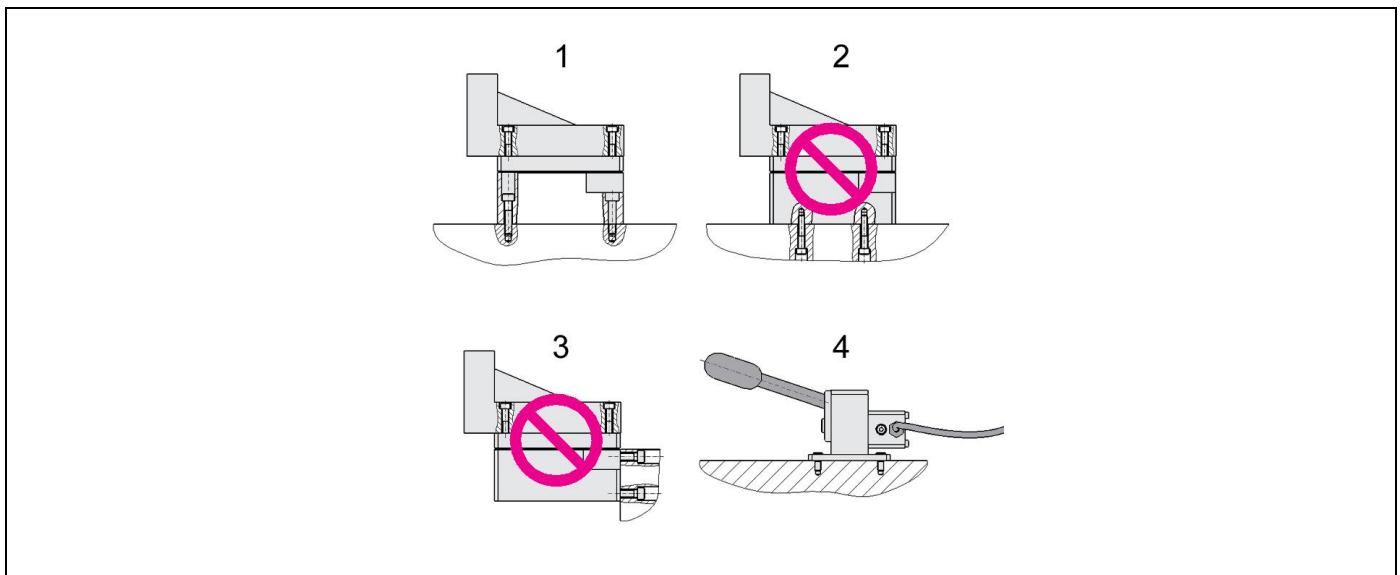


Figure 3: Possible principles of fixation

1 Wall mounting screwed through rotary module Angle bracket provided by the customer at the flange plate	3 Not admissible!
2 Not admissible!	4 of pressure generator (transmitter unit)

i NOTE

To reach the third indexing position a swing angle of $\sim 230^\circ$ is required.

The mounting types depend on the design of the rotating module.

7.3 Mounting of the customer's connecting construction

⚠ WARNING

Injury due to overturning product!

- Overturning product due to eccentric load provided by the user!
- The centre of gravity of the user's load must be within the 4 fixing screws of the bottom plate.
- 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.

1. For fixing of the customer's connecting construction there are 4 bore holes (for M10 - $\varnothing 10.5$ mm) at the top plate.
All provided bore holes have to be used!
2. Fasten the connecting construction at the top plate.

i 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.

8 Operation

⚠ WARNING

Injury by crushing!

- Loads (torques) can lead to an unexpected start of the product.
- When releasing the index, counter hold the existing load.
- Pay attention to an ergonomic working place and max. physical forces.

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!

⚠ CAUTION

Indexing dynamically overloaded!

If the indexing bolt engages in full motion, the indexing will be dynamically overloaded.

- The module must only be moved to the engaging position in a controlled manner (counterhold).

8.1 Version without indexing

The rotating module does not have an indexing in its basic version.

The rotating operation is effected manually at the workpiece or at the assembly fixture.

8.2 Hydraulic indexing

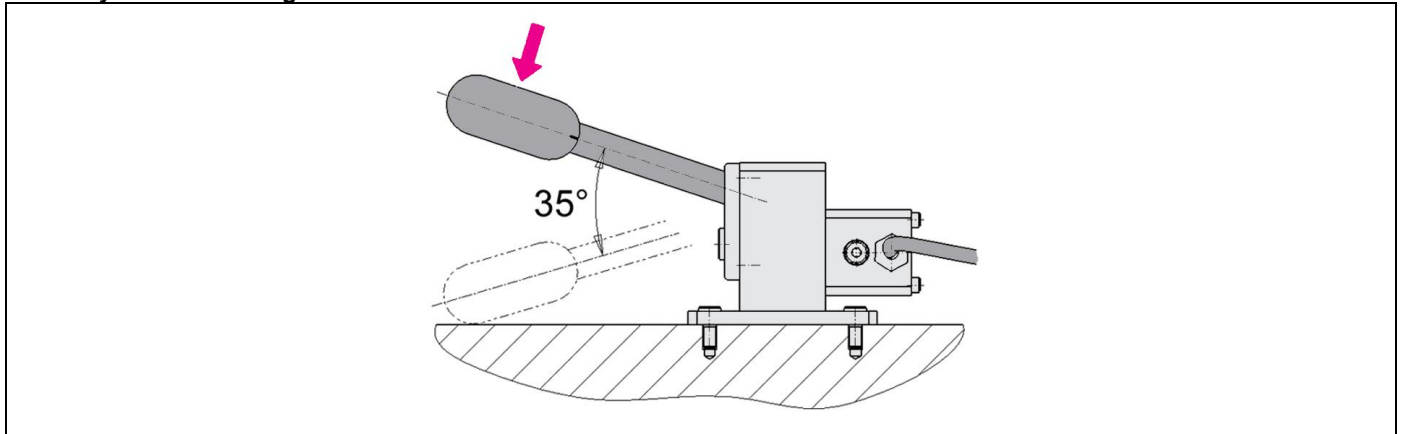


Figure 4: Operation - Indexing operated by a foot pedal

By operating the foot pedal by 35° the index is released and the workpiece or the fixture can be rotated.

If the foot pedal is not operated, the index bolt engages automatically into the next indexing position.

The operation with a foot pedal guarantees that the operator always has both hands free.

9 Maintenance

9.1 Plan for maintenance

Maintenance works	Interval	by...
Cleaning, visual inspection of the rotating module and control of the indexing	daily	Operator
Check tightness and leakage of hydraulic connections (visual control) every day.		
Check all fixing screws, retighten if required. Control of the indexing	half-yearly checks	Expert
Check smooth running with little load over the entire rotating range	yearly	Expert
Check smooth running with load over the entire rotating range		

An expert has to check all hydraulic hoses at least once a year if they are still work-proof. Assessed damages have to be repaired immediately.		
Hydraulic hoses have to be exchanged in accordance with the BGR 237 with new hydraulics hoses.	after 6 years	Specialist with expert knowledge in hydraulics
Revision by the manufacturer (recommendation)	after 50,000 cycles	ROEMHELD service staff
Repair	in case of damages	ROEMHELD service staff

NOTE

Qualification

Pay attention to the qualification of the personnel.

9.2 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.).

9.2.1 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 the indexing for smooth running and clearance

NOTE

Repair works

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

9.2.2 Yearly checks

Hydraulic system, hydraulic hoses

An expert has to check all hydraulic components at least once a year if they are still work-proof. Assessed damages have to be repaired immediately.

The following checks and works have to be effected:

- An expert has to check all hydraulic hoses at least once a year if they are still work-proof. Assessed damages have to be repaired immediately.
- The hydraulic hoses of the device have to be exchanged as per BGR 237 at least after 6 years by new ones.

9.3 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.

9.4 Maintenance of the hydraulic indexing

The rotating module with hydraulic indexing is a compact and functional unit.

It consists of a basic module with integrated indexing mechanism and an operating unit with foot pedal, connected by a 2 m long hydraulic hose.

This flexible connection allows the individual placement of the operating unit at the most favourable ergonomic position.

The rotating operation is manually effected at the workpiece or at the assembly fixture.

The design of the indexing is a closed system.

When opening the system, the preloaded effect will get lost.

To guarantee a system free from air, the transmitter unit, the high-pressure hose and the receiver unit must be flushed.

Procedure:

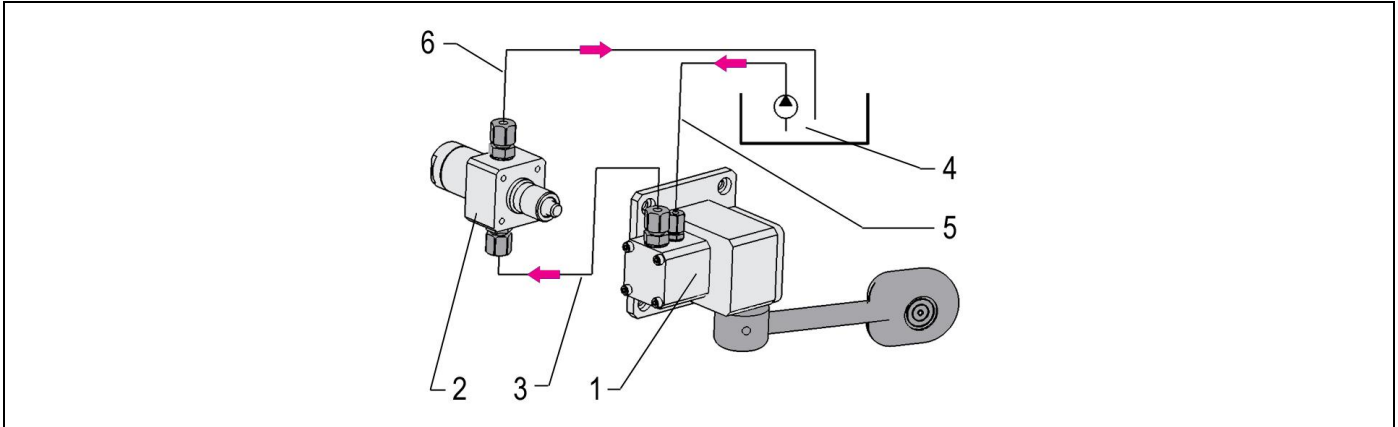


Figure 5: Sketch how to vent the indexing

➔ Direction of flushing	4 Pressure generator for flushing, with return line to the reservoir
1 Transmitter unit	5 Flushing line
2 Receiver unit	6 Reservoir line
3 High-pressure hose 2 m	

1. Connection of hose lines (see fig. of the sketch).

NOTE

The ports have to be aligned towards the top.

2. Connect to a pressure generator (preferably to a small power unit).
3. Flush the system several minutes.
Actuate the pedal several times to loosen trapped air bubbles.

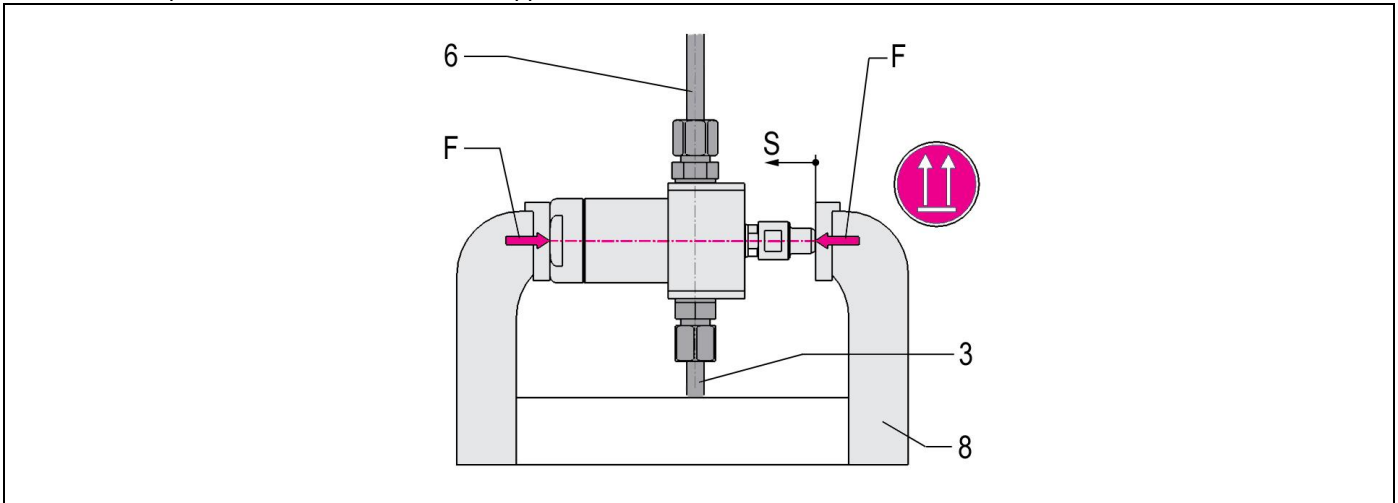


Figure 6: Alignment for bubble free mounting of the fittings

! Pay attention to the oil level	7 Plug
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4. Align the transmitter unit as shown and remove the flushing line.

NOTE

Align the transmitter unit as shown in the figure.
Oil must be in the connecting port up to the upper edge of the connecting thread.
Refill oil, if required.

Put the plug slightly tilted onto the surface of the oil and screw in.

5. Vent the receiver unit

⚠ CAUTION

Injury due to the spring in the subassembly!

The component can slip and the piston extends.
Provide a holding device!

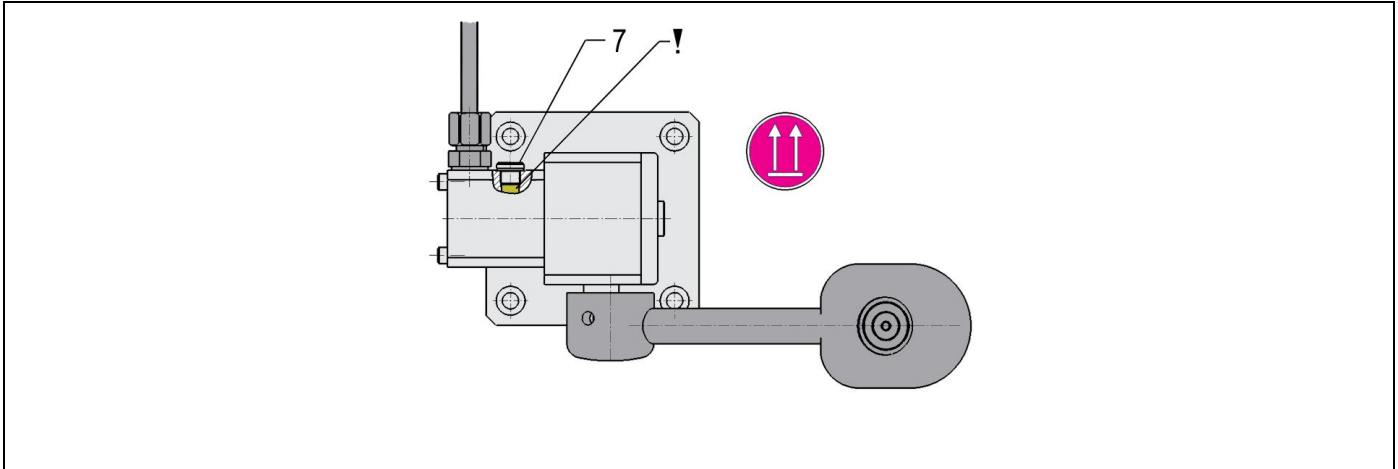


Figure 7: Alignment for bubble free mounting of the fittings

3 High-pressure hose 2 m	F Force required
6 Reservoir line	S Stroke approx. 13.5 mm
8 Vice or clamp	

Receiver unit in shown alignment, in the vice, preload and remove reservoir line.

NOTE

Align the receiver unit as shown in the figure.

Oil must be in the connecting port up to the upper edge of the connecting thread.

Refill oil, if required.

Put the plug slightly tilted onto the surface of the oil and screw in.

6. Loosen the preload of the receiver unit.
7. Check function.

10 Trouble shooting

⚠ CAUTION

All work by service personnel only!

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

All rotating modules

Trouble	Cause	Remedy
Indexing does not engage	Too fast rotation	Decelerate rotation
	Max. admissible torques exceeded In-dexing defect	⚠ Caution ! Works only to be effected by ROEMHELD service personnel.
Clearance in the indexing too large	Wear or max. admissible torques ex-ceeded	⚠ Caution ! Works only to be effected by ROEMHELD service personnel.

Only for indexing with foot pedal

Trouble	Cause	Remedy
Indexing does not disengage	Air in the hydraulic system Components were opened	⚠ Caution ! Works only to be effected by ROEMHELD service personnel.

11 Technical characteristics

Maximum admissible load

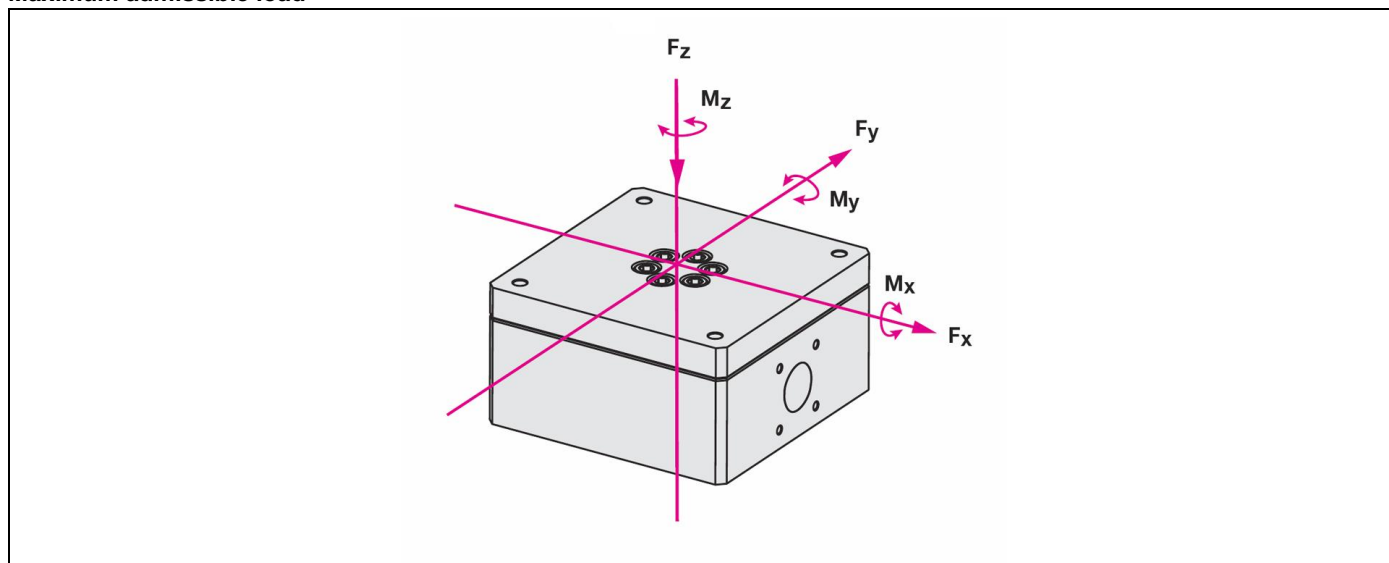


Figure 8: Axes of the introduced forces and torques

M Max. torques in the axes: X, Y or Z	F Max. admissible forces in the axes: X, Y or Z
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Max. admissible forces, for all versions

$F_x = \pm 2,000 \text{ N}$

$F_y = \pm 2,000 \text{ N}$

$F_z = \pm 6,000 \text{ N}$.

Max. admissible torques

NOTE

These torques are valid for all versions with indexing in engaged mode.

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

General characteristics

Type		Mz [Nm]
6506 10 36 O	Without indexing	not relevant
6509 10 XX O I	Indexing with foot pedal	800

Weight (dead weight)

Type		m [kg]
6506 10 36 O	Without indexing	15
6509 10 XX O I	Indexing with foot pedal	25

NOTE

Further information

- For further technical data see ROEMHELD data sheet.

CAUTION

Indexing dynamically overloaded!

If the indexing bolt engages in full motion, the indexing will be dynamically overloaded.

- The module must only be moved to the engaging position in a controlled manner (counterhold).

12 Accessory

NOTE

Accessories

- See data sheet.

13 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.

14 Declaration of manufacture

Manufacturer

Römheld GmbH Friedrichshütte
Römheldstraße 1-5
35321 Laubach, Germany
Tel.: +49 (0) 64 05 / 89-0
Fax: +49 (0) 64 05 / 89-211
E-mail: info@roemheld.de
www.roemheld.com

Responsible person for the documentation:

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

Declaration of manufacture of the products

They are designed and manufactured in line with the relevant versions of the directives **2006/42/EC**(EC MSRL) and in compliance with the valid technical rules and standards.

In accordance with EC-MSRL, these products are components, that are not yet ready for use and are exclusively designed for the installation in a machine, a fixture or a plant.

According to the pressure equipment directives the products are not to be classified as pressure reservoirs but as hydraulic placing devices, since pressure is not the essential factor for the design, but the strength, the inherent stability and solidity with regard to static or dynamic operating stress.

The products may only be put into operation after it was assessed that the incomplete machine / 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.

Laubach, 09.01.2026