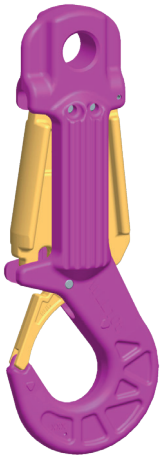
> ROV-HOOK 2.0 <
(Twin Trigger Mechanism)

Safety instructions

These instructions/this manufacturer's declaration must be kept safe during the entire period of use.
TRANSLATION OF THE ORIGINAL SAFETY INSTRUCTION

EN



> ROV-HOOK 2.0 <
for use with Work Class ROVs
(Remotely Operated Vehicles = remotely controlled underwater vehicles)

RUD Ketten
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RUD Art. No.: 7910835-EN / 02.020

RUD BLUE-ID SYSTEM

Simple test, management and documentation subject to mandatory testing operating resources, equipment and components.

EG-Konformitätserklärung

entsprechend der EG-Maschinenrichtlinie 2006/42/EG, Anhang II A und ihren Änderungen

Hersteller: **RUD Ketten**
Rieger & Dietz GmbH u. Co. KG
Friedensinsel
73432 Aalen

Hiermit erklären wir, dass die nachfolgend bezeichnete Maschine aufgrund ihrer Konzipierung und Bauart, sowie in der von uns in Verkehr gebrachten Ausführung, den grundlegenden Sicherheits- und Gesundheitsanforderungen der EG-Maschinenrichtlinie 2006/42/EG sowie den unten aufgeführten harmonisierten und nationalen Normen sowie technischen Spezifikationen entspricht.
Bei einer nicht mit uns abgestimmten Änderung der Maschine verliert diese Erklärung ihre Gültigkeit.

Produktbezeichnung: ROV-HOOK

Folgende harmonisierten Normen wurden angewandt:

DIN EN 1677-1 : 2009-03	DIN EN ISO 12100 : 2011-03

Folgende nationalen Normen und technische Spezifikationen wurden außerdem angewandt:

BGR 500, KAP2.8 : 2008-04

Für die Zusammenstellung der Konformitätsdokumentation bevollmächtigte Person:
Michael Betzler, RUD Ketten, 73432 Aalen

Aalen, den 26.09.2016 Dr.-Ing. Arne Kriegsmann,(Prokurist/QMB)
Name, Funktion und Unterschrift Verantwortlicher

EC-Declaration of conformity

According to the EC-Machinery Directive 2006/42/EC, annex II A and amendments

Manufacturer: **RUD Ketten**
Rieger & Dietz GmbH u. Co. KG
Friedensinsel
73432 Aalen

We hereby declare that the equipment sold by us because of its design and construction, as mentioned below, corresponds to the appropriate, basic requirements of safety and health of the corresponding EC-Machinery Directive 2006/42/EC as well as to the below mentioned harmonized and national norms as well as technical specifications.
In case of any modification of the equipment, not being agreed upon with us, this declaration becomes invalid.

Product name: ROV-HOOK

The following harmonized norms were applied:

DIN EN 1677-1 : 2009-03	DIN EN ISO 12100 : 2011-03

The following national norms and technical specifications were applied:

BGR 500, KAP2.8 : 2008-04

Authorized person for the configuration of the declaration documents:
Michael Betzler, RUD Ketten, 73432 Aalen

Aalen, den 26.09.2016 Dr.-Ing. Arne Kriegsmann,(Prokurist/QMB)
Name, function and signature of the responsible person

Contents

Read the assembly instructions thoroughly before using the ROV-HOOK. Make sure you have understood everything.
Failure to observe the instructions can result in physical injury or material damage and means that the warranty no longer applies.

1 Safety instructions

WARNING
If sling systems are wrongly mounted, damaged or incorrectly used, this can result in physical injury and material damage in the event of a fall.
Always check all sling systems carefully prior to each use.

- Remove all body parts (fingers, hands, arms, etc.) out of the hazard area (danger of crushing or squeezing) during the lifting process.
- Take any extreme circumstances or shock loads into account when selecting the right ROV-HOOK and components.
- The ROV-HOOK may be used only if the closing system, with release/locking latch and safety latch, is in perfect working condition.
- The ROV-HOOK may be used only by authorised and trained persons in adherence to BGR 500 / DGUV regulations 100-500, Section 2.8 and, outside Germany, observing the relevant specific national regulations.
- Do not exceed the working load limit (WLL) indicated on the ROV-HOOK.
- No technical alterations must be implemented on the ROV-HOOK.
- No people may stay in the danger zone.
- Jerky lifting (strong impacts) should be prevented.
- Always ensure a stable position of the load when lifting. Swinging must be prevented.
- Damaged or worn ROV-HOOK must never be utilised.

2 Proper use

The ROV-HOOK was developed for use with Work Class ROVs (Remotely Operated Vehicles = remotely controlled underwater vehicles), which are used, for example, in the construction of subsea structures in deep seas.

The ROV-HOOK may be operated by people as well as by a ROV Manipulator.

Working Load Limit of the ROV-HOOK 2.0:
ROV-HOOK 2.0 10 t: WLL = 10 t

ROV-HOOK 2.0 25 t: WLL = 25 t

The ROV-HOOK described here may be used for lifting or moving loads only when the hook are locked shut.

Note that the ROV-HOOK must be aligned in the pulling direction. It must never be subjected to bending forces.

Use the ROV-HOOK only with suitable shackles and suitable grippers.

The ROV-HOOK may be used only for the purposes described here (see Section 4 Improper use).

3 Instructions for assembly and use

3.1 General information

- Permissible temperature range during use
  -20°C to 200°C ==> no exceptions
  Temperatures above 200°C are not permitted!
- ROV-HOOKs must never be brought into contact with aggressive chemicals, acids or their vapours.

3.2 Assembly/shackle connection instructions

- Shackle type, e.g. Green Pin Standard D shackle or bow shackle with safety pin, nut and split pin.
  Recommendation for ROV-HOOK 2.0 10 t:
  GP 12 t, safety pin 35 mm, inside width 51 mm
  Recommendation for ROV-HOOK 2.0 25 t:
  p.ex. GP 25 t, safety pin 50 mm, inside width 74 mm
- The shackle must be able to swivel easily when installed.

NOTE
The shackle pin must be secured, e.g. with a split pin, to prevent it from accidentally coming loose.

- In the case of multi-leg suspensions, the ROV HOOK must be attached with the opening of the hook facing outwards (see Fig. 1).

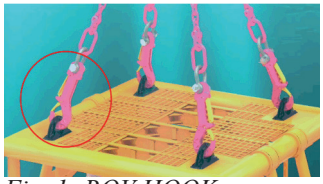


Fig. 1: ROV HOOK opening faces outwards

3.3 General information regarding use

- Check the ROV-HOOK before each use to ensure that the connection to the shackle is secure.
- Ensure that the forces run in a straight line without any twists, buckling or kinks.
- Make sure that the load sits properly in the ROV HOOK and that the safety latch is closed when the hook is in use.
- Check the entire sling system at regular intervals and each time it is put into service to ensure that it is still suitable for use as a sling system and to identify any severe corrosion, wear, deformation etc. (see Section 5 Inspection / repair).

WARNING
If sling systems are wrongly mounted, damaged or incorrectly used, this can result in physical injury and material damage in the event of a fall..
Always check all sling systems carefully prior to each use.

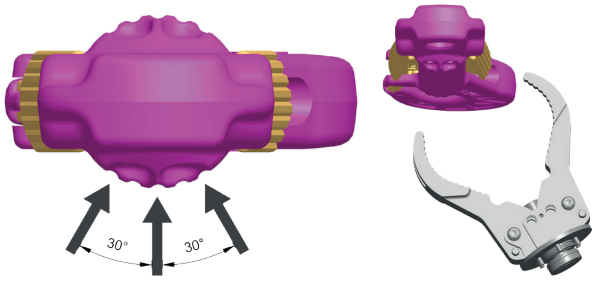
- RUD components are designed according to DIN EN 818 and DIN EN 1677 for a dynamic load of 20,000 load cycles.
  - Keep in mind that several load cycles can occur with a lifting procedure
  - Keep in mind that, due to the high dynamic stress with high numbers of load cycles, that there is a danger that the product will be damaged
- The BG/DGUV recommends: For higher dynamic loading with a high number of load cycles (continuous operation), the working load stress must be reduced according to the driving mechanism group 1Bm (M3 in accordance with DIN EN 818-7). Use a lifting mean with a higher working load limit.

3.4 Using the ROV-HOOK

ATTENTION
Parts of the body (fingers, hands, arms etc.) in the ROV-HOOK can be crushed and injured during attaching and lifting procedures.
Keep all limbs out of range of the ROV-HOOK when attaching/lifting construction components.

3.4.1 Grip range

The ROV-HOOK can be operated by the gripper at an angle of up to 30° (with respect to its vertical cross section lateral axis).



Figs. 2 and 3: Permissible grip range: up to 30°

3.4.2 Permissible gripper types

The ROV-HOOK can be used by hand (manually) as well as by ROV manipulators (Remotely Operated Vehicles). ROV manipulators have two functional arms that can be used to pull, push and rotate, and even operate tools. Different grippers can be connected to the arms for this purpose.

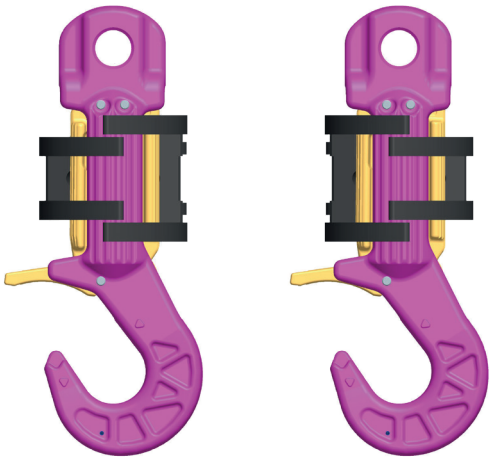
Permissible gripper types

- Parallel grippers(1)
- 3-finger grippers (2)
- 4-finger grippers (grabbers) (3)

(1) *(2)* *(3)*

Fig. 4: Gripper types

All types of grippers (compare picture 4) can be used at both sides.



(A) *(B)*

Fig. 5: Using the grippers

3.4.3 Opening the ROV-HOOK with an ROV manipulator

The safety latch of the ROV-Hook has to be opened as follows:

- Press the release/locking latch and the securing latch at the same time (Fig. 6)

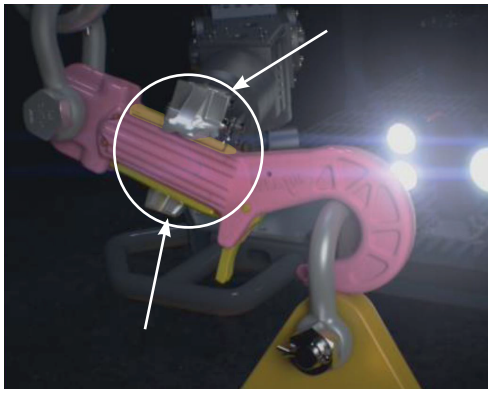


Fig. 6: Press the release/locking and the securing latch

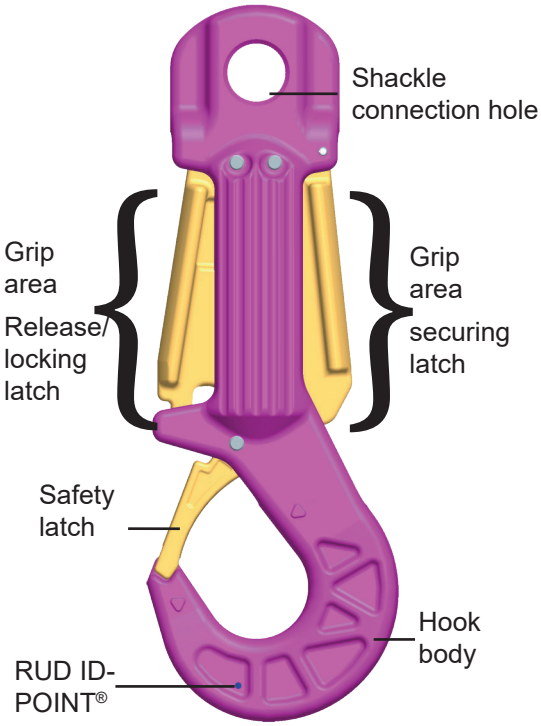


Fig. 7: Detailed illustration of the ROV-HOOK

As a security function, the ROV-HOOK is equipped with a 2 latch opening mechanism. This prevents the safety latch/ROV-HOOK from being opened inadvertently (see Fig. 8).

1. **ROV-HOOK in its normal position.**
   The safety latch is locked in place (1).
2. **<u>Simultaneously pressing</u> of the releasing (A) and securing latch (B).**
   Safety latch is unlocked and opens up (2).

HINT
The securing latch will move first, due to a small spring force.

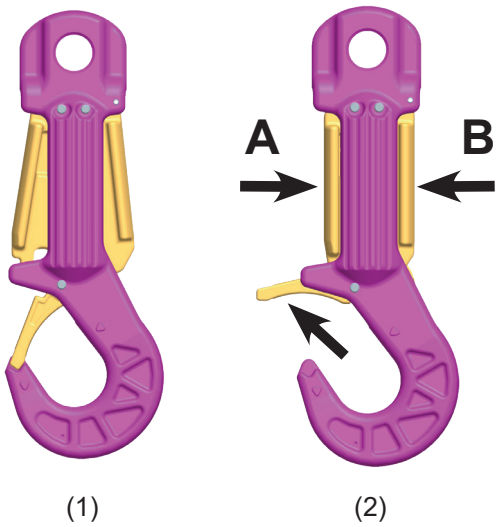
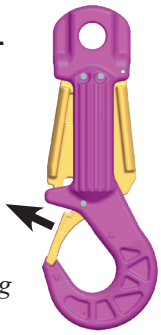


Fig. 8: The ROV-HOOK opening mechanism

! The ROV-HOOK safety latch must close and lock automatically as soon as you release the release/locking latch!

Checking: Safety latch <u>must not</u> be able to open towards the direction of the arrow (Pic. 9)!



Pic. 9: Checking of safety latch

3.4.4 Cleaning and maintenance

- Clean the ROV-HOOK thoroughly with fresh water after each submersion. This will reduce susceptibility to corrosion.
- Oil the mechanical components of the ROV-HOOK (release/locking latch and safety latch, see Fig. 10) regularly with biodegradable penetrating oil.

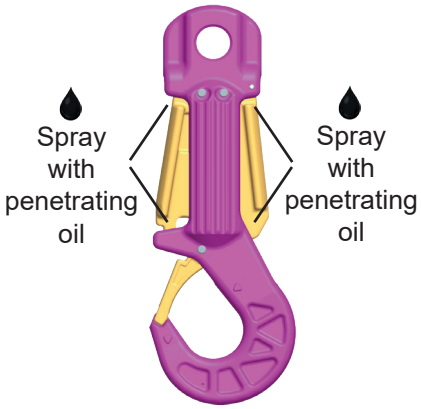


Fig. 10: Spray components with penetrating oil

3.5 Instructions regarding regular checking

At regular intervals, appropriate to your level of usage but at least once per year, have an expert check that the sling system is still suitable for its purpose (see Section 5, Inspection / repair).

Depending on the conditions of use, e.g. frequent use, increased wear or corrosion, it may be necessary to carry out checks at shorter intervals than once per year.

4 Improper use

The following improper uses of the ROV-HOOK are not permitted and must be avoided at all cost!

WARNING
If sling systems are wrongly mounted, damaged or incorrectly used, this can result in physical injury and material damage in the event of a fall.
Always check all sling systems carefully prior to each use.

Make sure that...

- ... the ROV-HOOK is always loaded in the pulling direction and is not subjected to bending loads (no point or edge loads).

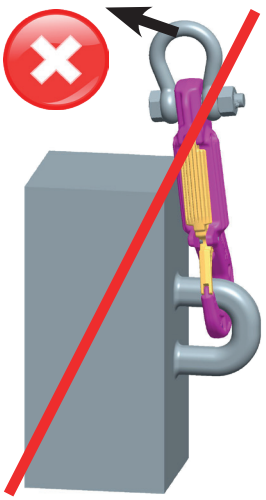


Fig. 11: ROV-HOOK with load at the side

- ... the ROV-HOOK is always loaded in the pulling direction and is not subjected to bending loads (no point or edge loads).

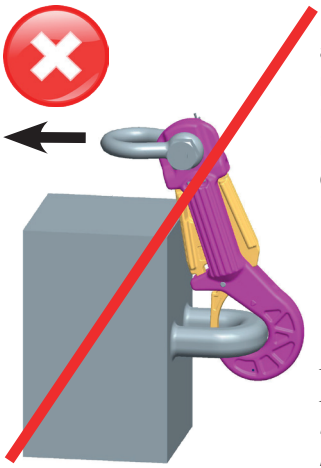


Fig. 12: ROV-HOOK loaded in the direction of the hook tip

Make sure that the ROV-HOOK is not opened unintentionally as a result of an edge load.

- ... the ROV-HOOK is always loaded in the pulling direction and is not subjected to bending loads (no point or edge loads).

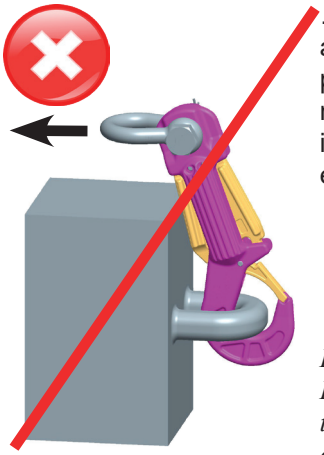


Fig. 13: ROV-HOOK loaded in the direction of the back of the hook

- ... the ROV-HOOK is always loaded in the pulling direction and is not subjected to bending loads (no point or edge loads).

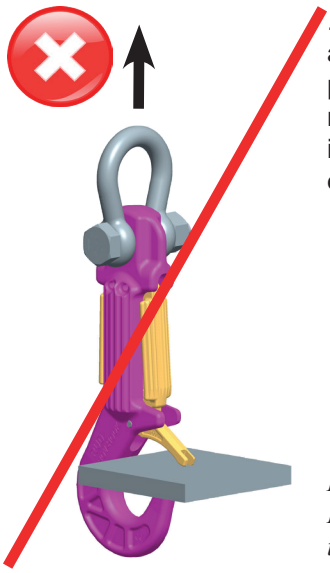


Fig. 14: ROV-HOOK loaded at the tip

5 Inspection / repair

5.1 Hints for periodical inspections

The operator must determine and specify the nature and scope of the required tests as well as the periods of repeating tests by means of a risk assessment (see sections 4.2 and 4.3).

The continuing suitability of the ROV-HOOK must be checked at least 1x year by an expert.

Depending on the usage conditions, f.e. frequent usage, increased wear or corrosion, it might be necessary to check in shorter periods than one year. The inspection has also to be carried out after accidents and special incidents. The operator must specify the test cycles.

5.2 Test criteria for the regular visual inspection by the user

- Completeness of the ROV-HOOK
- Complete legible load-bearing information as well as the manufacturer‘s identification mark.
- Deformations on load-bearing parts such as f.e. at the bottom of the hook opening and damages at safety latch, release/locking latch and securing latch
- Mechanical damage such as significant notches, cracks, particularly in areas subject to tensile stress.
- Check that the safety latch and the release/locking latch close and lock again automatically. When locked, it must be impossible for the safety latch to open. Function controlling of safety-, locking- and securing latch, compare pic. 9 and chapter 3.4.3. *Opening the ROV-HOOK with an ROV manipulator.*

5.3 Additional test criteria for the competent person / repair worker

- Cross-section alterations caused by wear > 10 % Widening of the mouth must not exceed by more than 10 % of the nominal dimension (see Fig. 15).
- Strong corrosion
  Exposure to seawater can cause severe corrosion of the mechanical moving parts. This can inhibit opening and closing. For this reason, always check that the release/locking latch, the securing latch and safety latch open and close properly.

WARNING
A faulty closing mechanism can result in physical injury and material damage in the event of a fall.
Take the ROV-HOOK out of service immediately if the release/locking latch, securing latch or safety latch no longer close properly.

- The hook should be carefully inspected in regard of mechanical damage such as strong notches, cracks, especially at areas where tensile stress occures.
- Further checks may be required, depending on the result of the risk assessment (e.g. testing for cracks in load-bearing parts).

6 Instructions regarding repairs

6.1 General information on repairs

- Repair work may be carried out only by specialists who have the necessary skills and training.
- Use only original RUD replacement parts and record the completed repair/reconditioning measures by entering them in the chain record card (the entire sling system) or using AYE-D.NET.

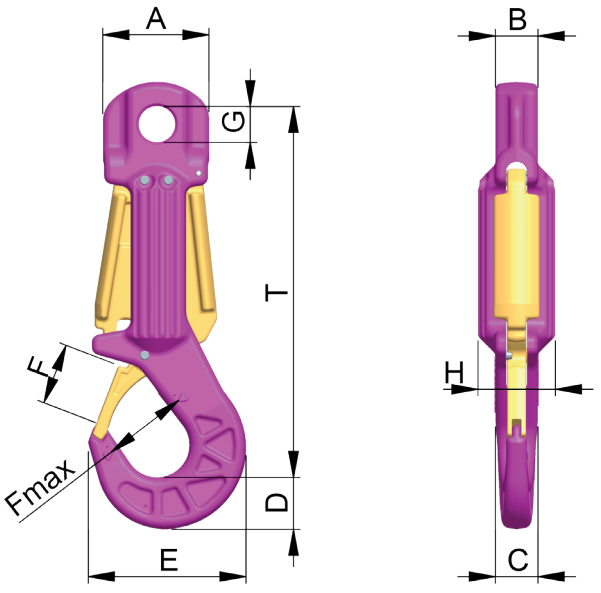


Fig. 15: Dimensions

Name	Capacity [t]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Fmax [mm]	G [mm]	H [mm]	T [mm]	Weight [kg/pc.]	Art. No.
ROV-HOOK 2.0 10 t	10	112	45	45	55	166	65	99	38	82	393	13,7	7910553
ROV-HOOK 2.0 25 t	25	132	55	55	92	249	96	130	52	82	484	26	7910554

Table 1: Dimensions

Subject to technical changes without notice.