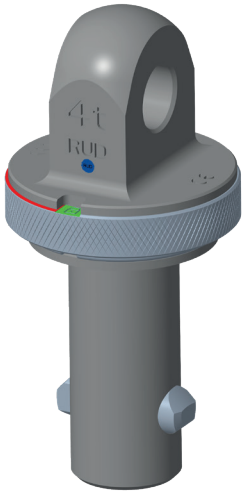
PIP-RAPIDO
Plug-in
lifting point

EN

User manual

This user manual must be kept for the entire usage time of the product and forwarded with the product.

TRANSLATION OF THE ORIGINAL USER MANUAL



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RUD art. no.: 7913368-EN - V07 / 04.2025

PIP-RAPIDO
Plug-in lifting point

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
Germany

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: PIP-RAPIDO

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:

DGUV-R 109-017 : 2020-12

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

Aalen, 29.03.2023 Hermann Kolb, Head of division MA

Name, function and signature of the responsible person

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Name, function and signature of the responsible person

CONTENT

This user manual contains information about how to use the plug-in lifting point PIP-RAPIDO safely and correctly.

Before using PIP-RAPIDO, read the user manual carefully and in full. Make sure that you have understood all of its contents. If you need further information, ask your RUD specialist dealer or RUD applications engineer.

Failure to follow instructions can result in injury or damage to property, and invalidates the warranty.

1 Safety instructions

WARNING
Incorrectly mounted or damaged PIP-RAPIDO and improper use can lead to injuries, damage to property and falling loads. Check the PIP-RAPIDO carefully before each use.

WARNING
*Lifting is not allowed if the lock indicator is in the RED range **(RED | LOCK OPEN** or **RED | No symbol visible)**, since the safety-functionality of the PIP-RAPIDO cannot be ensured in this state.*

- Withdraw all body parts (fingers, hands, arms etc.) from the danger zone during the lifting process (risk of crushing).
- PIP-RAPIDO may be used only by authorised and instructed persons in compliance with DGUV Rule 109-017 and in compliance with the applicable national regulations if used outside Germany.
- PIP-RAPIDO may be assembled and dismantled only when free of any load.
- No technical modifications may be made to the PIP-RAPIDO.
- The snap ring may not be removed.
- Nobody is allowed in the danger zone.
- Avoid jolts and strong impacts during lifting.
- Ensure a stable position of the load during lifting. Swinging must be avoided.
- Damaged or worn PIP-RAPIDO may not be used.

2 Intended use

- PIP-RAPIDO may be used only for lifting components with through-hole fixtures, flanges or holes with an undercut of the prescribed depth.
- PIP-RAPIDO may not be used as personal protective equipment (PPE) to protect persons from falling.
- PIP-RAPIDO are not suitable for offshore use.
- PIP-RAPIDO may only be subjected to a WLL in the approved loading direction (*Table 4 / Fig. 17 and Fig. 18*). Other loading directions are not permitted.
- PIP-RAPIDO are not suitable for rotating under load.
- PIP-RAPIDO are permitted for use only with holes and not for threads.
- PIP-RAPIDO may be used to lift loads only when in the locked position.
- PIP-RAPIDO may be used only for the purposes described here.

3 Mounting and usage instructions

3.1 General information

- Permitted temperature range:
  PIP-RAPIDO can be used in a temperature range of 0°C to +90°C.

WARNING
Following usage at a temperature above the specified range, further usage is not allowed. The PIP-RAPIDO must be replaced with another. This is because the quality/safety/symbol indications of the PIP-RAPIDO can no longer be relied upon.

- PIP-RAPIDO may not be allowed to come into contact with aggressive chemicals, acids and their vapours.
- Surface finish: Electro-galvanised.

3.2 Permitted usages

PIP-RAPIDO may be used only for the following usage cases:

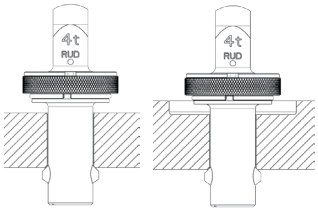
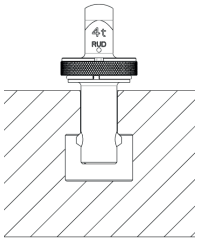
Flange and through-hole fixture (without/with spot facing (cf. Section *3.7.2*))	
Hole with undercut (for specifications, see below)	

Table 1: Possible usages

Specifications for holes with undercut:
Minimum diameter of undercut = distance between the two support elements (dimension E) x 1.35
Depth of undercut = diameter of support elements x 3

Information about the chamfer size:
The chamfer on the workpiece to be lifted must be at an angle of 45° and will affect the effective thickness of the flange on which the PIP-RAPIDO is supported.
Recommended chamfer size: 1x45° to 2x45°

- Up to 2x45°, no adjustment is necessary and the actual flange thickness value can be used.
- However, if this chamfer value is exceeded, the additional effective flange thickness reduction must be taken into account.

Formula for calculating the choice of flange thickness configuration for chamfers larger than 2x45°:
L_{eff} = flange thickness - chamfer size1 - chamfer size2 + 4

Example of a 3x45° chamfer size on both sides of the drilled hole (Fig. 1 B):
Compared to the maximum recommended size of 2x45° *(Fig. 1 A),* 3x45° reduces the effective flange thickness by 1 mm on both sides.

If the flange has a thickness of 40 mm, the selection of the appropriate PIP-RAPIDO must now be determined with 38 mm:

L_{eff}	= flange	- chamfer	- chamfer	+ 4
38 mm	= 40 mm	- 3 mm	- 3 mm	+ 4 mm

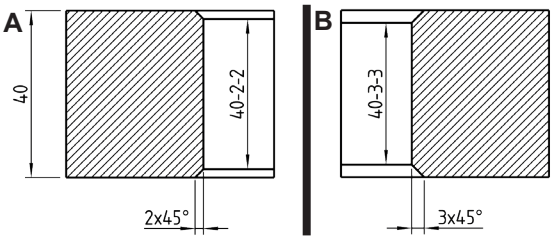


Fig. 1: Correlation of chamfer size and effective flange thickness
A: Chamfer size 2x45°
➔ effective flange thickness without adjustment permitted
B: Chamfer size 3x45°
➔ effective flange thickness insufficient, use of formula required

3.3 Overview of markings

3.3.1 Markings on PIP-RAPIDO

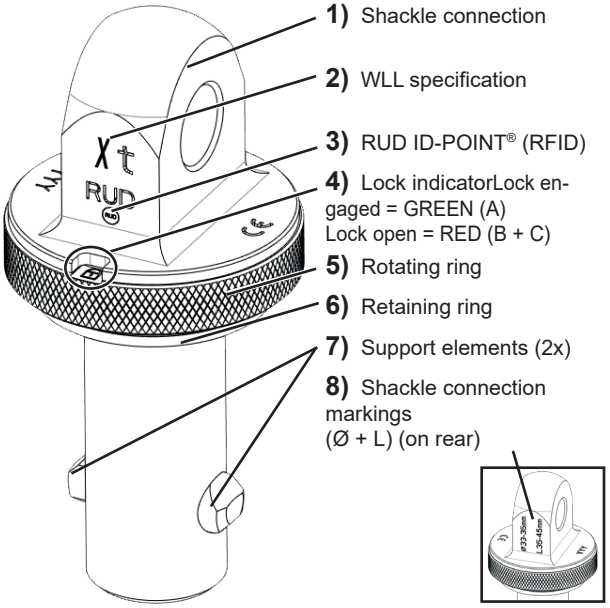


Fig. 2: Markings on PIP-RAPIDO

Markings on shackle connection:

Ø Hole diameter on shackle connection for component to be lifted

L Height of flange/depth of hole of component to be lifted

Example Meaning of labelling (rear of shackle connection, cf. *Fig. 3*):

- Hole diameter:
  Ø 33.0-35.0 mm
- Height of flange:
  L = 35.0-45.0 mm

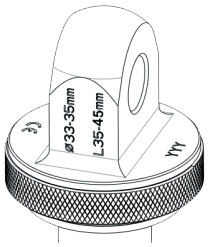


Fig. 3: Markings on rear of shackle connection

3.3.2 Detailed view of lock symbols

Symbols on rotating ring (cf. *Table 5*):

- **GREEN | LOCK ENGAGED** (*Fig. 4*)
  - PIP-RAPIDO ready to lift.
  - Support elements extended.

A

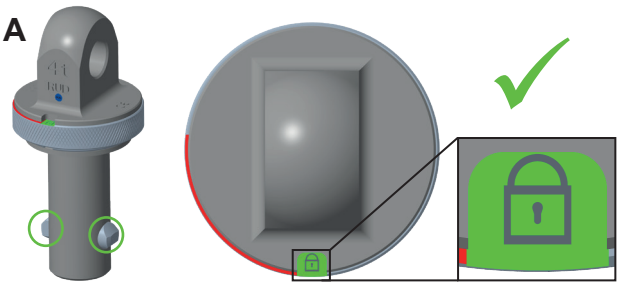


*Fig. 4: Symbol **GREEN | LOCK ENGAGED** = PIP-RAPIDO is ready for lifting*

- **RED | LOCK OPEN** (*Fig. 5*)
  - PIP-RAPIDO can be mounted/removed.
  - PIP-RAPIDO not ready to lift.
  - Support elements retracted.

B

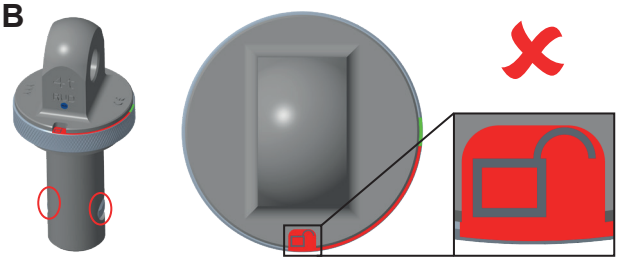


*Fig. 5: Symbol **RED | LOCK OPEN** = PIP-RAPIDO can be mounted/removed*

- **RED | No symbol visible** (*Fig. 6*)
  - PIP-RAPIDO not ready to lift.
  - PIP-RAPIDO not ready for mounting/removal.
  - Support elements not completely extended.

C

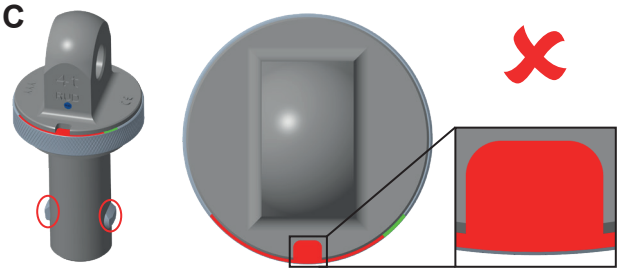


Fig. 6: Symbol RED | No symbol visible = PIP-RAPIDO is not ready for lifting

3.4 Mounting of PIP-RAPIDO

WARNING
Make sure that the PIP-RAPIDO is only mounted/removed when not under load.

Proceed as follows to mount it:

1 Make sure that the following component dimensions match the markings on the PIP-RAPIDO:
  - Hole diameter Ø
  - Flange thickness L

2 Only use suitable PIP-RAPIDO (cf. *Table 5*).

3 Apply the PIP-RAPIDO to the appropriate hole.
  - Symbol **GREEN | LOCK ENGAGED**
  - Support elements extended

4 Turn the rotating ring as far as it will go.
  - As you turn the rotating ring, the symbols and colours change.
  - Symbol **RED | LOCK OPEN**
  - PIP-RAPIDO not ready to lift.
  - PIP-RAPIDO can be inserted into hole.

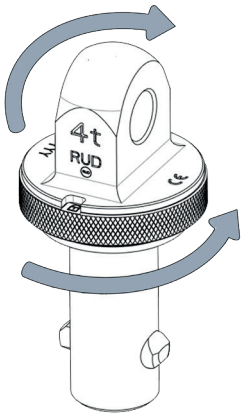


Fig. 7: Turning the rotating ring

5 Hold the rotating ring open and insert the shaft into the hole as far as it will go.

6 When you let go, the rotating ring turns back to its initial position and locks automatically.
  - The notch moves over the rotary plate to return to the green range.
  - Symbol **GREEN | LOCK ENGAGED**
  - Support elements extended (ready for lifting)

NOTICE
Only use manual force for locking and unlocking; do not use tools. If you turn the PIP-RAPIDO *too far, you will damage it and it will have to be removed from service.*

7 Make sure that the hole dimensions are suitable for the PIP-RAPIDO and that the symbol is in the **GREEN** range.
The green **LOCK ENGAGED** symbol must be visible (cf. *Table 1 Possible usages*).

8 Make sure that the PIP-RAPIDO can be rotated through 360° when mounted.

9 Then check that it has been mounted correctly (see Section *4 Inspection/repair/disposal*).

3.5 Incorrect mounting

Always make sure that the PIP-RAPIDO has been mounted correctly (cf. *Table 5*).

WARNING
Incorrectly mounted or damaged PIP-RAPIDO and improper use can lead to injuries, damage to property and falling loads.
Check the PIP-RAPIDO carefully before each use.

The following errors can occur during the mounting process and must be avoided (cf. *Table 5*)!

Incorrect mounting:

- **The flange/component thickness does <u>not</u> comply with the prescribed length range:**
  - The flange/component thickness is too large: Support elements cannot extend outside the flange/component (cf. *Fig. 8 - A*).
  - The flange/component thickness is too small: The support forces are too low (cf. *Fig. 8 - B*). The WLL cannot be achieved.

  ► Only use the PIP-RAPIDO in the prescribed length range (see the marking on the shaft (L)).

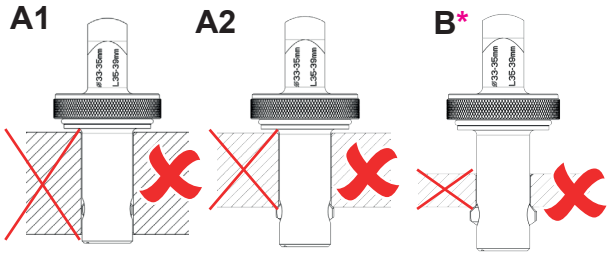


Fig. 8:
A1 and A2: Flange/component thickness too high
B: Flange/component thickness too low
**Exception: If lifting is vertical only (± 7°), the minimum flange thickness does not need to be reached. However, make sure that the material properties in conjunction with the residual wall thickness of the component to be lifted are sufficient to receive the occurring WLLs.*

- **Hole does <u>not</u> comply with the prescribed diameter range:**
  - Hole too large: The PIP-RAPIDO/support elements have an insufficient contact surface (cf. *Fig. 9 - A*).
  - Hole too small: The PIP-RAPIDO cannot be mounted (cf. *Fig. 9 - B*).

  ► Only use the PIP-RAPIDO in the prescribed diameter range (see the marking on the shackle connection (L)).

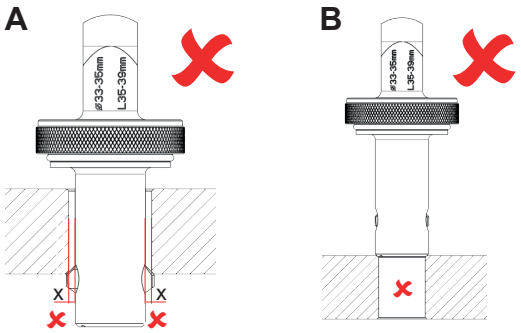


Fig. 9:
A: Hole too large (gap x too large)
B: Hole too small

NOTICE
All dimensional limits on the PIP-RAPIDO are to be considered without further tolerance.
<u>Example:</u> The indication 32-34 mm corresponds to 32.0-34.0 mm. This means that 31.9 mm and also 34.1 mm are outside of the permitted range!

3.6 Removal of PIP-RAPIDO

WARNING
Make sure that the PIP-RAPIDO *is only mounted/removed when not under load.*

Proceed as follows to remove it:

1 Turn the rotating ring as far as it will go.
- The notch moves over the rotary plate to the red range.
- Symbol **RED | LOCK OPEN**
- PIP-RAPIDO ready for removal.

2 Hold the rotating ring open and remove the shaft from the hole.

NOTICE
Only use manual force for locking and unlocking; do not use tools. If you turn the PIP-RAPIDO too far, you will damage it and it will have to be removed from service.

3 Store the PIP-RAPIDO accordingly (cf. *4.5 Maintenance/storage*).

3.7 Using the PIP-RAPIDO

3.7.1 General information on use

WARNING
Incorrectly mounted or damaged PIP-RAPIDO and improper use can lead to injuries, damage to property and falling loads. Check the PIP-RAPIDO carefully before each use.

WARNING
Make sure that the PIP-RAPIDO is always completely mounted up to the end position and engaged during the lifting process.
If it is not mounted correctly, the PIP-RAPIDO or falling load can cause injuries or damage to property.

- Make sure that the PIP-RAPIDO is inspected regularly before use (e.g. by the rigger) to check the function of the support elements and rotating ring and the integrity of the symbols, to make sure there is no significant corrosion, and to ensure the absence of dents and cracking on bearing parts and deformations etc. See Section *4 Inspection/ repair/disposal*.
- RUD components are designed as per DIN EN 818 and DIN EN 1677 for a dynamic WLL of 20,000 load cycles.
  - Remember that multiple load cycles can take place during a single lifting operation.
  - Note that due to the high dynamic load, there is a danger that the product can be damaged if there is a high number of load cycles.
  - The BG/DGUV recommends that the stress at WLL be reduced in accordance with mechanism group 1Bm (M3 as per DIN EN 818-7) in the case of a high dynamic WLL with high load cycle numbers (continuous operation). Use a lifting point with a higher WLL.
- Make sure that the working environment of the PIP-RAPIDO is clean and tidy. Heavy soiling can restrict the movement of moving parts.
- Before each lifting process, ensure the following:
  - Symbol **GREEN | LOCK ENGAGED**

    
  - Support elements extended.
  - The specifications of the hole diameter and flange thickness of the PIP-RAPIDO match the component.

WARNING
*Lifting is not allowed if the lock indicator is in the RED range **(RED | LOCK OPEN** or **RED | No symbol visible)**, since the safety-functionality of the PIP-RAPIDO cannot be ensured in this state.*

- For every single WLL, align the PIP-RAPIDO in the direction of force (cf. *Fig. 10 and Table 5*).

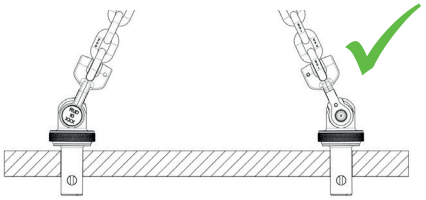


Fig. 10: Permitted WLL and ring assembly alignment

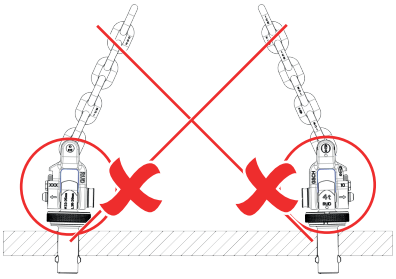


Fig. 11: Prohibited WLL and ring assembly alignment (not aligned in the direction of force)

- Avoid impacting or jolting WLLs.

WARNING
In the case of multi-chain lifting processes, sudden jolts can occur during lifting. Make sure that the support elements are always in contact with the load during lifting, otherwise the load may fall.

- Whenever possible, leave the immediate danger zone.
- Always keep your suspended loads under observation.

3.7.2 Use in hole with spot facing

Note the following for spot facing:

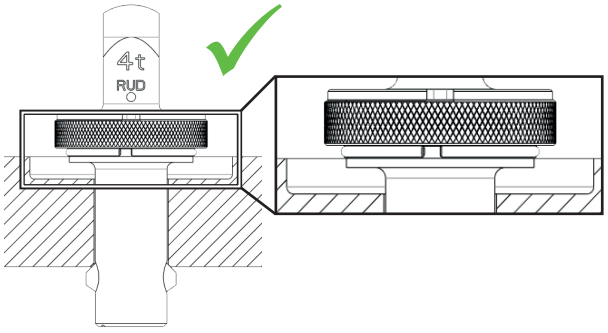


Fig. 12: Correct mounting for hole with spot facing

- Use sufficiently large spot facing to ensure that the PIP-RAPIDO only comes into contact with the contact surface on the component and that the rotating ring does not touch any edges even when under WLL.

WARNING
To ensure proper function, the rotating ring must never be allowed to come into contact with the component!

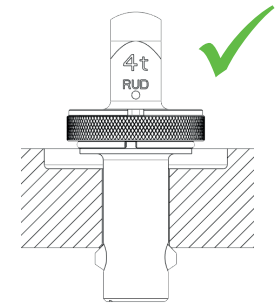
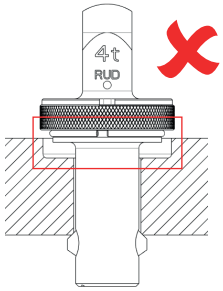
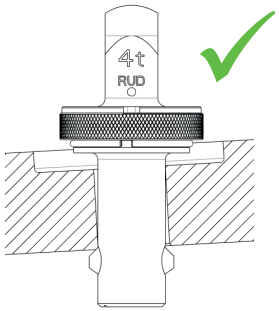
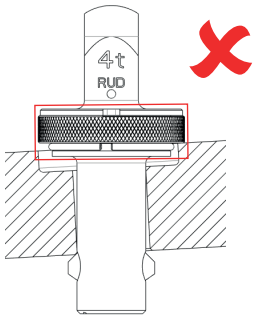
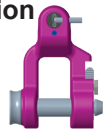
Permitted use	Prohibited use
Spot facing OK	Spot facing too small = prohibited rotating ring contact
	
	

Table 2: Spot facing overview

3.7.3 Information on shackle connection

- Shackle recommendation:
  - RUD fork head shackle with appropriate connection dimensions



  - Standard curved shackle with appropriate connection dimensions

- The WLL of the PIP-RAPIDO may not be undershot by the WLL of the used shackle (for loading directions, see *Fig. 17 / Fig. 18*).
- Pay attention to the connection dimensions.

4 Inspection/repair/disposal

4.1 Information about regular checks

The operator is responsible for determining and defining the type and scope of the required inspections and the deadlines for repeat inspections on the basis of a risk assessment (see Sections *4.2 and 4.3*).
Irrespective of this, the continued suitability of the PIP-RAPIDO must be checked at least once a year by an expert.
Depending on the usage conditions, such as frequent use, increased wear occurrence or corrosion, inspections might be required at shorter intervals than a year. An inspection is also required following damage events and any noteworthy incidents.
The inspection cycles must be defined by the operator.

4.2 Inspection criteria for regular visual checks by the user

- Completeness of the PIP-RAPIDO
- Complete and legible size specifications and markings on shackle connection, manufacturer's symbol present
- Easy visibility of GREEN and RED ranges on rotating ring
- Rotating ring can be turned completely open (RED | LOCK OPEN)
- Spring presses rotating ring completely into the closed position (GREEN | LOCK ENGAGED)
- Support elements can be pushed easily into the hole
- Retaining ring present and sits correctly in its groove
- No mechanical damage such as large dents, particularly in areas subject to tensile stress

4.3 Additional inspection criteria for the expert/ repairer

- Changes in cross-sections on start of shaft due to wear occurrence > 4 %
- Heavy corrosion
- Dimensional check of support elements (cf. *Table 3 / Fig. 15*): Dimension E may be reduced by max. 0.8 mm.
- Check for wear on support elements:
  Fig. 13 shows an example of wear occurrence. The position, length and depth of the depression can vary depending on the usage case.
  However, only the depth needs to be considered during the inspection. As a reference, the depth to the deepest line is measured starting from the top line.
  This distance may not exceed 1 mm. Otherwise, the PIP-RAPIDO must be taken out of service.

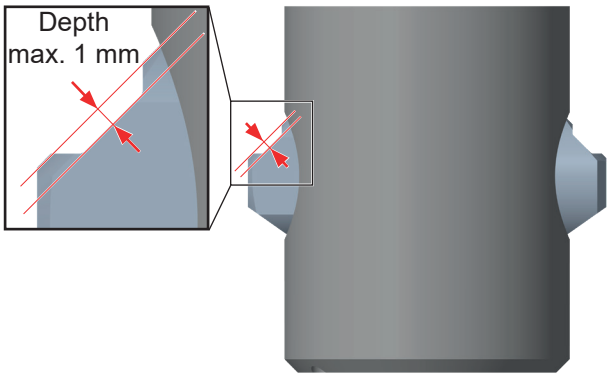


Fig. 13: Maximum wear occurrence depth 1 mm

- Additional inspections might be necessary depending on the result of the risk assessment (e.g. check for cracks on load-bearing parts).

4.4 General repair information

- The snap ring may not be removed.
- Repair work may be carried out only by experts at RUD.

4.5 Maintenance/storage

Always store PIP-RAPIDO in a clean, dry place. Stored lifting points must be in the locked position ("GREEN"). The PIP-RAPIDO must be locked even if it remains in the component.

Good care and correct storage maintain the quality and functionality of the lifting points.

Remove any soiling and clean the PIP-RAPIDO regularly.

Oil mechanically moved components of the PIP-RAPIDO at regular intervals using biodegradable penetrating oil (cf. *Fig. 14*):

- Rotating ring (opening for lock symbol)
- Support elements

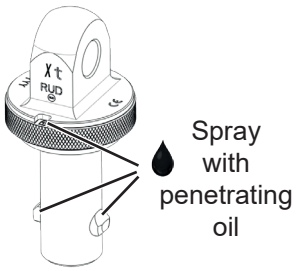


Fig. 14: Lubrication

4.6 Disposal

Dispose of packaging and components/accessories that have reached the end of their service life in accordance with local regulations and provisions.

5 Technical data

Description	A [mm]	B [mm]	C [mm]	Range of hole diameter D D_{min} [mm]	Range of hole diameter D D_{max} [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	J [mm]	Range of flange thickness L L_{min} [mm]	Range of flange thickness L L_{max} [mm]	T [mm]	Item no.
PIP-RAPIDO D30-D41	19	42	25	30	41	D+8	55	L+104	23	68	L+34	16	100	54.5	8600670
PIP-RAPIDO D40-D51	23	52	30	40	51	D+10	65	L+117	26	78	L+40	20	100	59,5	8600671

Table 3: Dimensions *Subject to technical changes*

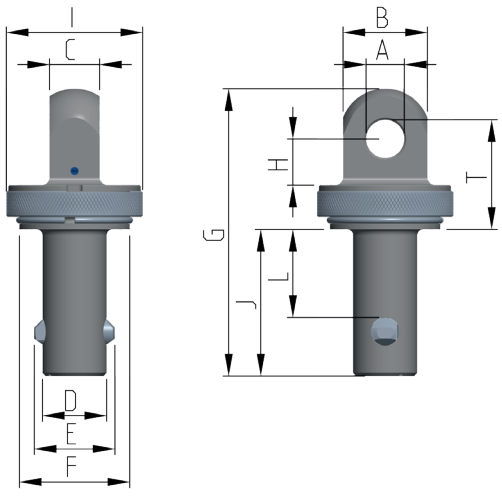


Fig. 15: Dimensions
Fig. 16:

WARNING
The configuration must always be between the minimum and maximum size!
If the configuration is incorrect, the PIP-RAPIDO or falling load can cause injuries or damage to property.
For calculation examples, see Section 6.

HINT
For information on the gauge function for size PIP-RAPIDO D40-D51 (RUD art. no. 8600671), see separate supplementary sheet 7914598.

Attachment type											
No. of chains	1	1	1	2	2	2	2	2	3 or 4	3 or 4	3 or 4
Tilt angle <ß	0°-7°	8°-45°	90°	0°-7°	90°	0°-45°	>45°-60°	Asymm.	0°-45°	>45°-60°	Asymm.
Factor			1		2		1	1		1.5	1
	Max. total weight in tonnes										
D30-32 | D31-33	4.2	3	2	8.4	4	4.2	2	2	6.3	3	2
D32-34 | D33-35	4.2	3.7	2.5	8.4	5	5.1	2.5	2.5	7.77	3.75	2.5
D34-36 | D35-37	4.2	4.2	3	8.4	6	5.88	3	3	8.8	4.5	3
D36-38 | D37-39	4.2	4.2	3.6	8.4	7.2	5.88	3.6	3.6	8.8	5.4	3.6
D38-40 | D39-41	4.2	4.2	4.2	8.4	8.4	5.88	4.2	4.2	8.8	6.3	4.2
D40-42 | D41-43	5.5	5.5	4.6	11	9.2	6.4	4.6	4.6	9.6	6.9	4.6
D42-44 | D43-45	5.5	5.5	5	11	10	7	5	5	10.5	7.5	5
D44-46 | D45-47	5.5	5.5	5.5	11	11	7.7	5.5	5.5	11.5	8.25	5.5
D46-48 | D47-49											
D48-50 | D49-51											

Table 4: WLL

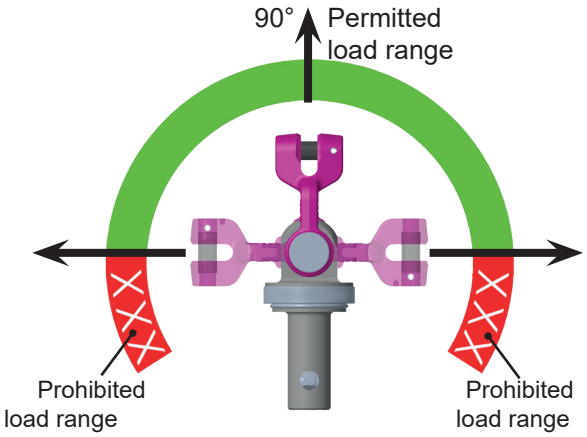


Fig. 17: Permitted load range in load ring plane

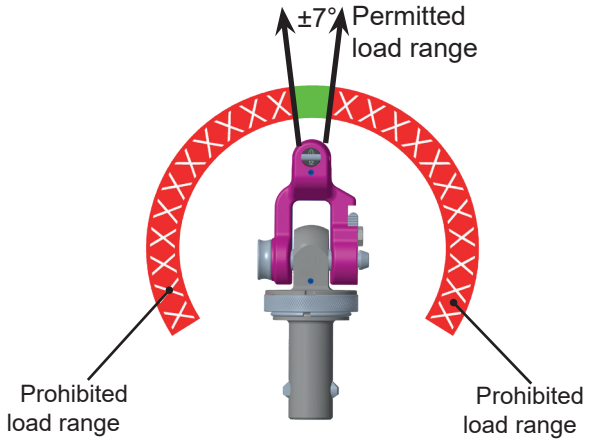


Fig. 18: Prohibited load transverse to load ring plane

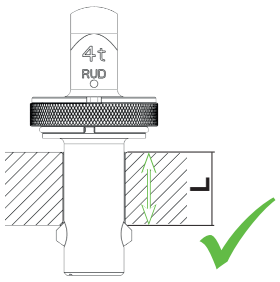
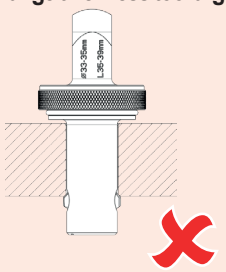
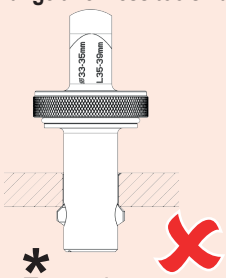
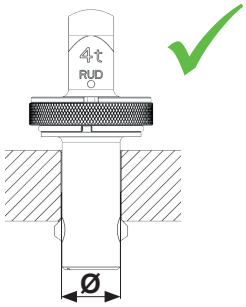
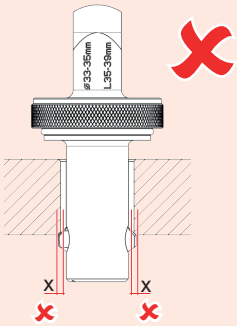
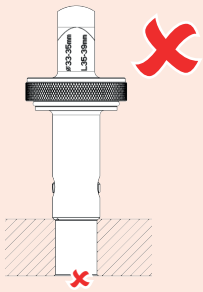
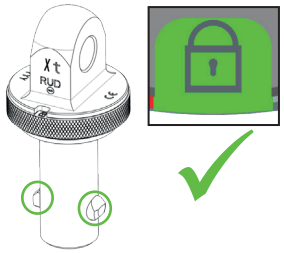
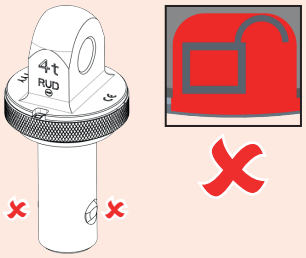
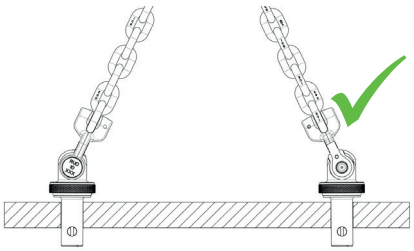
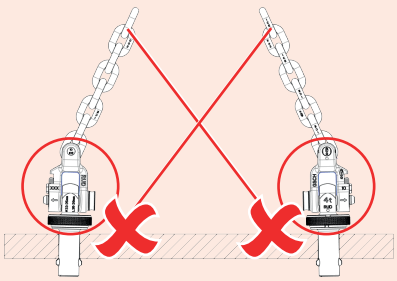
	Use PERMITTED	Use PROHIBITED	
See "L" specification on shackle connection for flange thickness	**Flange thickness complies with length range**	**Flange thickness does not comply with prescribed length range**	
		**Flange thickness too large** 	**Flange thickness too small**  *Exception see below
Hole diameter **See "Ø" specification on shackle connection for flange hole**	**Hole complies with marking** 	**Hole does not comply with prescribed diameter range** **Hole too large** 	**Hole too small** 
Symbol on rotating ring	**GREEN | LOCK ENGAGED** = support elements extended **Ready for lifting** 	**RED | LOCK OPEN** = support elements retracted PIP-RAPIDO not ready to lift 	
Loading direction	**Aligned in direction of force** 	**Not aligned in direction of force** 	

Table 5: Overview of symbols

***EXCEPTION**

If lifting is vertical only (± 7°), the minimum flange thickness does not need to be reached. However, make sure that the material properties in conjunction with the residual wall thickness of the component to be lifted are sufficient to receive the occurring WLLs.

6 Calculation examples

6.1 Hole diameter D (incl. tolerance)

Nom. size [mm]	Tolerance limit [mm]	Min. size [mm]	Max. size [mm]	Configurable diameter range	Range of hole diameter PIP-RAPIDO D as per *Table 8 Dimensions* D_{min} [mm]	D_{max} [mm]	Configuration of PIP-RAPIDO *2	Permitted diameter range
35	± 0.5	34.5	35.5	max. 2,0 mm	30	41	D: 34 - 36 mm	✓
41	± 0.5	40.5	41.5	max. 2,0 mm	30	41	D: 40 - **42*** mm	✗
30	± 0.5	29.5	30.5	max. 2,0 mm	30	41	D: **29*** - 31 mm	✗

Table 6: Hole diameter examples

6.2 Flange thickness L (incl. tolerance)

Nom. size [mm]	Tolerance limit [mm]	Min. size [mm]	Max. size [mm]	Configurable flange thickness range	Range of flange thickness PIP-RAPIDO L as per *Table 8 Dimensions* L_{min} [mm]	L_{max} [mm]	Configuration of PIP-RAPIDO *2	Permitted flange thickness range
50	± 4	46	54	max. 10,0 mm	16	100	L: 45 - 55 mm	✓
20	± 4.5	15.5	24.5	max. 10,0 mm	16	100	L: **15*** - 25 mm	✗
96	± 5	91	101	max. 10,0 mm	16	100	L: 91 - **101*** mm	✗

Table 7: Flange thickness examples

WARNING
The configuration must always be between the minimum and maximum size!
If the configuration is incorrect, the PIP-RAPIDO or falling load can cause injuries or damage to property.

***1** Value is above or below the permitted range for the hole diameter or flange thicknesses.

***2** Dimensional limits without further tolerance allowance. Example: The indication L45-55 mm corresponds to 45.0-55.0 mm. This means that 44.9 mm and also 55.1 mm are outside of the permitted range.

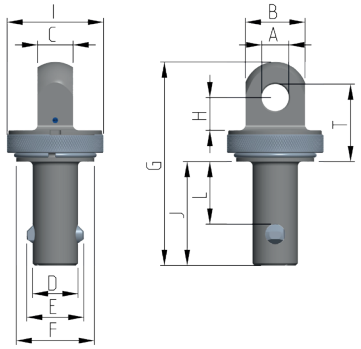


Fig. 19: Dimensions

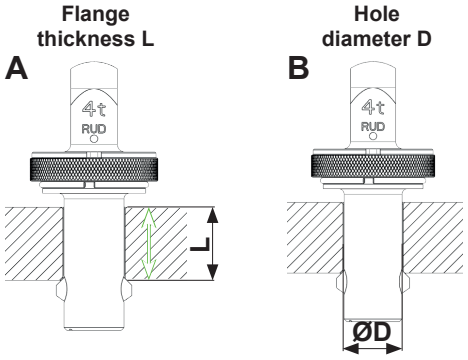


Fig. 20:
A: Flange thickness L
B: Hole diameter D

Description	A [mm]	B [mm]	C [mm]	Range of hole diameter D D_{min} [mm]	D_{max} [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	J [mm]	Range of flange thickness L L_{min} [mm]	L_{max} [mm]	T [mm]	Item no.
PIP-RAPIDO D30-D41	19	42	25	30	41	D+8	55	L+104	23	68	L+34	16	100	54.5	8600670

Table 8: Dimensions