> STARPOINT <
VRM

for bolts with min. quality class 10.9

EN

Safety instructions

This safety instruction has to be kept on file for the whole lifetime of the product and forwarded with the product.
TRANSLATION OF THE ORIGINAL INSTRUCTIONS

RUD

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STARPOINT
VRM
for bolts with min. quality class 10.9

RUD

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: StarPoint Ringmutter
VRM

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:

DGUV-R 109-017 : 2020-12

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

Aalen, den 15.04.2021 Hermann Kolb, Bereichsleitung MA

Name, Funktion und Unterschrift Verantwortlicher

RUD

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: STARPOINT Eye nut
VRM

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, den 15.04.2021 Hermann Kolb, Bereichsleitung MA

Name, function and signature of the responsible person

INHALT

Carefully read the operating instructions before using the VRM STARPOINT bolting lifting points (hereinafter referred to as VRM). Ensure that you have understood all the contents.
Non-observation of the instructions can lead to injuries or damage and will invalidate the guarantee.

1 Safety instructions

WARNING
Wrong assembled or damaged VRM as well as improper use can lead to injuries of persons and damage of objects when load drops.
Please inspect all VRM before each use.

- Withdraw all body parts (fingers, hands, arms etc.) from the danger zone during the lifting process (risk of crushing).
- The VRM may only be used by authorised and instructed persons in compliance with the DGUV Regulations chapter 109-017 and in compliance with any valid national regulations if used outside Germany.
- The WLL stated on the lifting point must not be exceeded (except vertical load see *Table 2*).
- The body of the VRM must be able to rotate 360° when screwed tight.
- The VRM is not suitable for turning movements under load.
- No technical modifications must be made to the VRM.
- No persons are allowed in the danger zone.
- Standing below suspended loads is prohibited.
- Jerky lifting (strong impacts) must be avoided.
- Ensure a stable position of the load during lifting. Swinging must be avoided.
- Damaged or worn VRM must not be used.

2 Intended use

The VRM may only be used for attachment to the load or to load-handling equipment.

They are designed for suspending lifting means.

The VRM can also be used as a lashing point to suspend lashing equipment.

The VRM may only be used for the purposes described here.

3 Instructions for assembly and use

3.1 General information

- Temperature suitability:
  -40°C to max. 100°C (-40°F up to 210°F)
- The VRM must not be exposed to aggressive chemicals, acids and their vapours.
- Clearly identify the attachment place for the VRM by means of contrasting colour markings.
- If the VRM is used only for lashing purposes, the WLL value can be doubled:
  LC = permissible lashing force = 2 x WLL

HINT
If the VRM as lashing point is loaded with a force exceeding WLL, it must no longer be used as a lifting point afterwards!
If the VRM as a lashing point is loaded with a force only up to the WLL, if can still be used as a lifting point.

3.2 Hints for mounting

The following applies in general:

- The attachment point so that the exerted forces can be absorbed by the base material without deformation.
- VRM should only be used with bolts or threaded studs with a min. quality class 10.9 and who are 100 % crack detected. **Less material characteristics at bolts or set screws are reducing the WLL!**
- In applications involving continuous stress, VRM may only be used with connecting elements that allow tightening to 70 % of the yield strength of the bolt thread.
- Select the position of the VRM so that impermissible loads, such as twisting or turning of the load, can be avoided.
  - **Single strand attachment:** vertically above the load's centre of gravity
  - **Double strand attachment:** above and on both sides of the load's centre of gravity
  - **Three or four-strand attachment:** evenly in one plane around the load's centre of gravity.
- Symmetry of load:
  Determine the required WLL of the individual RUD lifting point for symmetrical loading according to the following physical formula context:

$$W_{LL} = \frac{G}{n \times \cos ß}$$

W_{LL} = req. WLL of the lifting point / single strand (kg)
G = Load weight (kg)
n = Number of supporting strands
ß = Inclination angle of the individual strands

Number of supporting strands is:

	Symmetry
Double strand	2
Three/four-strand	3

Table 1: Supporting strands (see also Table 2)

HINT
At unsymmetrical loads, even if several lifting points are used, the WLL of a single lifting point must be at least equal to the load weight or ask the manufacturer.

HINT
When using the eyenut perpendicular only, the WLL from Table 2 can be used.

- A flat screw-on surface (ØE, see *Table 3)* with a threaded bolt/threaded pin inserted at right angles to it must be ensured.
  The internal thread must be 100% aligned with the bolt thread. A mounted threaded pin must ensure that the contact surface of the VRM can rest on the screw-on surface.
  VRMs whose nut insert does not sit on the screw-on surface must not be loaded.
- The VRM ring body must be able to rotate 360° when screwed tight.

Please pay attention to the following

- For a **single lift**, hand-tightening with a ring spanner until the bolt contact surface touches the screw-in surface is sufficient.

WARNING
The prescribed torque moment must not be exceeded or rather the hexagon of the nut insert must not be overtightened.
(The hexagon of the nut insert is not suitable for high torques because of its dimension.)

- If the VRM **is to remain permanently on the load**, it must be tightened with the tightening torque (± 10 %) depending on version, according to *Table 3*.

HINT
For the installation we recommend to use a matching double ended ring spanner (ØF see Table 3). Use when available, the head of screws or hex nuts for tightening.

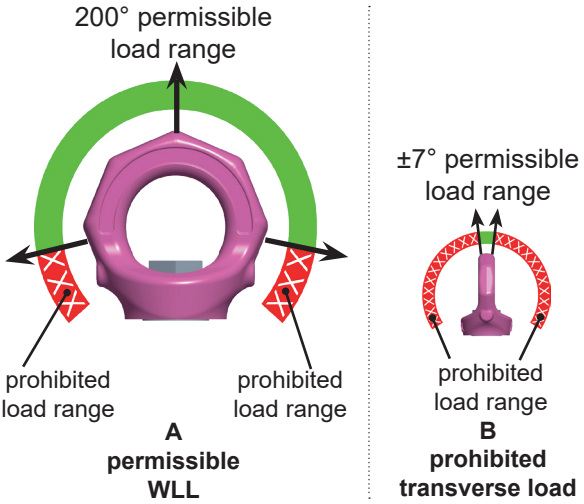
- In case of jolting WLL or vibration, in particular for through bolt connections, there may be unintended loosening.
  Securing options: keeping to the tightening torque or use liquid thread protection such a Loctite (adjusted to the application case, pay attention to manufacturer's instructions).
- Then check that everything has been mounted correctly (see Section*4 Inspection / Repair / Disposal*).

3.3 Hints for the usage

- The whole lifting point must be inspected regularly by a competent person (e.g. by the striker) in regard of secure fit of the nut insert, strong corrosion, cracks at load bearing parts, deformations, wear). See section *4 Inspection / Repair / Disposal*.

WARNING
Wrong assembled or damaged VRM as well as improper use can lead to injuries of persons and damage of objects when load drops.
Please inspect all VRM before each use.

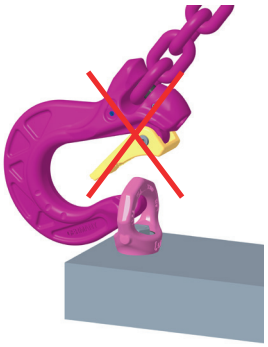
- RUD components are designed according to DIN EN 818 and DIN EN 1677 for a dynamic WLL of 20,000 load cycles.
  - Please note that during one lifting process, there might be several stress cycles.
  - Please note that due to the high dynamic load with high numbers of stress cycles, there is the risk of damage to the product.
  - The BG/DGUV recommends: at high dynamic WLL with high stress cycles (permanent operation), the working load must be reduced according to the engine group 1Bm (M3 according to DIN EN 818-7). Use a lifting point with a higher WLL.
- When engaging and disengaging the lifting means (lifting chain) no crushing, shearing, catching or impact points may be created..
- Prevent any damage to the lifting means on sharp-edged WLL.
- Before suspending the lifting means, set the VRM lifting point in direction of force (see *Pic. 1*).



Pic. 1:
A: Admissible load direction at load ring plane
B: Prohibited transversal load to the load ring plane

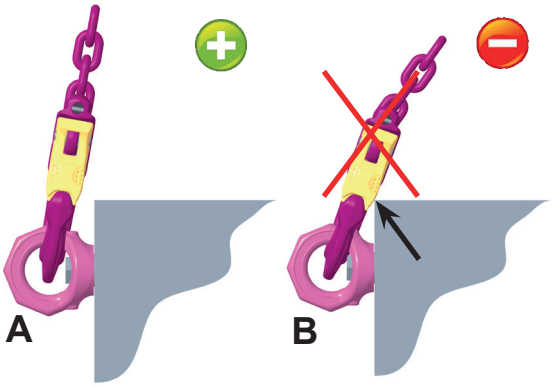
- Please note that the lifting means must be able to move freely in the VRM lifting point

HINT
Please note the reduced suspension height 'H' compared to the VRS.



Pic. 2: Only use appropriate lifting means for hinging in the VRM

- The lifting means must not be exposed to bending load!



Pic. 3:
A: Admissible load area
B: Prohibited positioning or placing on edges

- Always bolt the lifting point in fully.

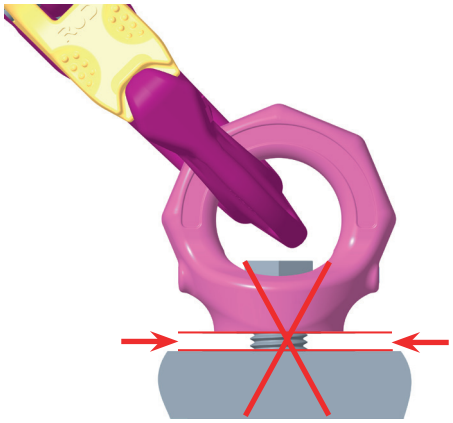


Abb./Pic./Image 4: The lifting point must be fully bolted in.

4 Inspection / Repair / Disposal

4.1 Hints for the regularly inspection

The operator has to determine and dictate the necessary inspection periods and the deadlines by a risk assessment (see sections *4.2 and 4.3*).
The persisting appropriateness of the lifting point must be checked by a competent person (auditor) at least once per year.
Depending on the conditions of use e.g. frequent use, increased wear or corrosion, it may be necessary to carry out inspections at shorter intervals than once per year. A verification is also required following damage and after special events. The operator must specify the test cycles.

4.2 Test criteria for the regular visual inspection by the user

- Ensure that the nut insert is securely seated → Check the tightening torque
- Lifting point is complete
- Complete, legible WLL information and manufacturer symbol
- Deformations on load-bearing parts such as ring bodies and nut inserts
- Mechanical damage such as large notches, in particular in areas subject to tensile loads
- easy jerk-free rotating of the ring around the bolt axis must be ensured.

4.3 Additional inspection criteria for the competent person resp. auditor

- Cross-section changes due to wear occurrence > 10%
- Heavy corrosion
- Function and damage to the nut insert and nut thread.
- Additional inspections may be necessary, depending on the result of the risk assessment (e.g. check for cracks in load-bearing parts).

4.4 Disposal

Dispose of the discarded components / accessories or packaging in line with local regulations.

5 Technical specifications

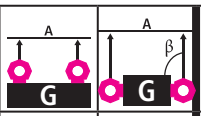
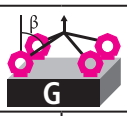
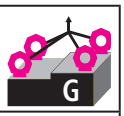
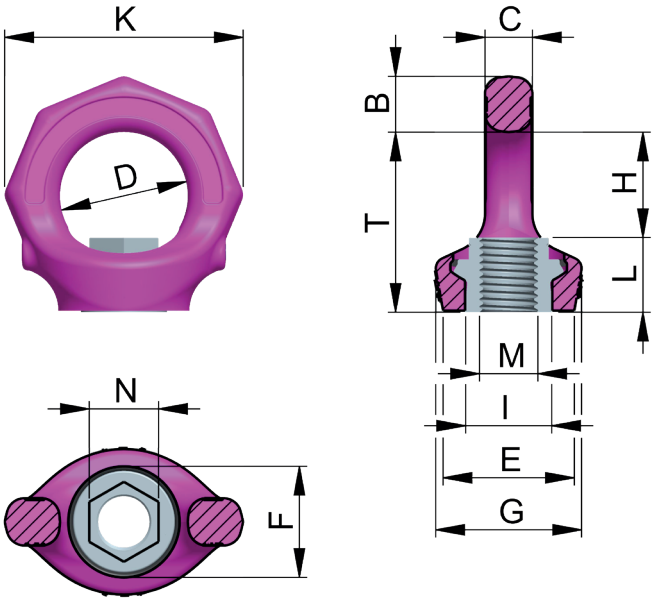
	Method of lift										
	Number of legs	1	1	2	2	2	2	2	3 / 4	3 / 4	3 / 4
	Angle of inclination <ß	0-7°	90°	0-7°	90°	0-45°	>45-60°	unsymm.	0-45°	>45-60°	unsymm.
	Factor	1	1	2	2	1.4	1	1	2.1	1.5	1
Safety factor 4:1	**Safety factor 4:1**	**WLL in [t] - for max. total load in tons.** Bolted and adjusted to the direction of pull									
	VRM-M 6	0.5	**0.1**	1	0.2	0.14	0.1	0.1	0.21	0.15	0.1
	VRM-M 8	1	**0.3**	2	0.6	0.42	0.3	0.3	0.63	0.45	0.3
	VRM-M 10	1	**0.4**	2	0.8	0.56	0.4	0.4	0.84	0.6	0.4
	VRM-M 12	2	**0.75**	4	1.5	1	0.75	0.75	1.57	1.12	0.75
	VRM-M 16	4	**1.5**	8	3	2.1	1.5	1.5	3.15	2.25	1.5
	VRM-M 20	6	**2.3**	12	4.6	3.22	2.3	2.3	4.83	3.45	2.3
	VRM-M 24	8	**3.2**	16	6.4	4.5	3.2	3.2	6.7	4.8	3.2
	VRM-M 30	12	**4.5**	24	9	6.3	4.5	4.5	9.5	6.75	4.5
	Safety factor 4:1	**WLL in [lbs] - for max. total load in lbs.** Bolted and adjusted to the direction of pull									
	VRM-M 6	1100	**220**	2200	440	310	220	220	460	330	220
	VRM-M 8	2200	**660**	4400	1320	930	660	660	1400	990	660
	VRM-M 10	2200	**880**	4400	1760	1240	880	880	1860	1320	880
	VRM-M 12	4400	**1650**	8800	3300	2330	1650	1650	3500	2470	1650
	VRM-M 16	8820	**3300**	17640	6600	4660	3300	3300	7000	4950	3300
	VRM-M 20	13230	**5070**	26460	10140	7170	5070	5070	10750	7600	5070
	VRM-M 24	17630	**7050**	35260	14100	9970	7050	7050	14950	10570	7050
	VRM-M 30	26450	**9920**	52900	19840	14020	9920	9920	21040	14880	9920
		At a lift with one strand and two parallel strands where the inclination angles are at the max.± 7°, the lifting methode can be assumed as a vertical lift.				When lifting with two, three or four leg lifting means, inclination angles of less than 15° shall be avoided, if possible (Risk of instability).					

Table 2: Working load limit in metric tons (top) and in lbs (bottom) *Subject to technical alterations*

Type	WLL [t]	weight [kg/pc.]	T [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	K [mm]	L [mm]	M	N [SW]	torque [Nm]	reference
VRM M6	0.1	0.06	28	9	7	20	23	16	28	17	13	37	11	M6	9	5	7900786
VRM M8	0.3	0.11	35	11	9	25	25	21	30	21	16.3	47	14	M8	12	10	7992989
VRM M10	0.4	0.11	35	11	9	25	25	21	30	21	16.3	47	14	M10	12	10	7990311
VRM M12	0.75	0.18	42	13	10	30	30	24	34	25	19.8	56	17	M12	14	25	7990312
VRM M16	1.5	0.32	49	15	13	35	36	30	40	29	23.6	65	21	M16	19	60	7990314
VRM M20	2.3	0.48	58	17	16	40	41	37	50	35	29.3	76	23	M20	24	115	7990315
VRM M24	3.2	0.83	70	20	19	49	51	45	60	41	35.2	92	29	M24	30	190	7990316
VRM M30	4.5	1.32	87	26	24	60	66	56	75	51	44	114	36	M30	36	330	7993008

Table 3: Dimensioning *Subject to technical alterations*



Pic. 5: Bemaßung